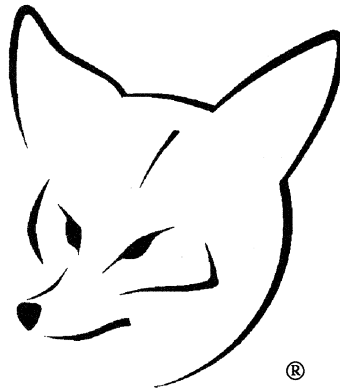


# FoxPro™



## Getting Started

May 1991

Fox Software, Inc.  
134 W. South Boundary  
Perrysburg, Ohio 43551

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# Introduction

## Greetings!

Welcome to the amazing world of FoxPro. In your hands is the best database management system we've ever created for the personal computer!

## Greetings!

---

Welcome to the amazing world of FoxPro. In your hands is the *best* database management system we've ever created for the personal computer!

Your first step is to install FoxPro. Simple installation instructions are located in the FoxPro *Installation Guide*.

The *Quick Tour* chapter in this manual showcases FoxPro's outstanding features.

A tutorial, *Groundwork through Now What?*, is available for new FoxPro users as well as old hands who want an introduction to the amazing new features of FoxPro 2.0.

The tutorial is divided into several short sessions. Each session focuses on one major topic and leads you through step-by-step.

By the time you've completed the tutorial, you'll have learned to create your own database, change it, retrieve information from it, combine that information in new ways, report on your data and design custom input screens for your data — all with incredible ease. And that's not all. You'll also learn to generate your own applications.

The tutorial is designed to be easy-to-follow and, as you gain expertise, it can stay by your side for reference.

As you use FoxPro, remember:

- The context-sensitive on-line help system is at your fingertips — just press F1. On-line help contains the most current information about FoxPro.
- If you have any problems, refer to the Customer Support appendix in the FoxPro *Developer's Guide*.

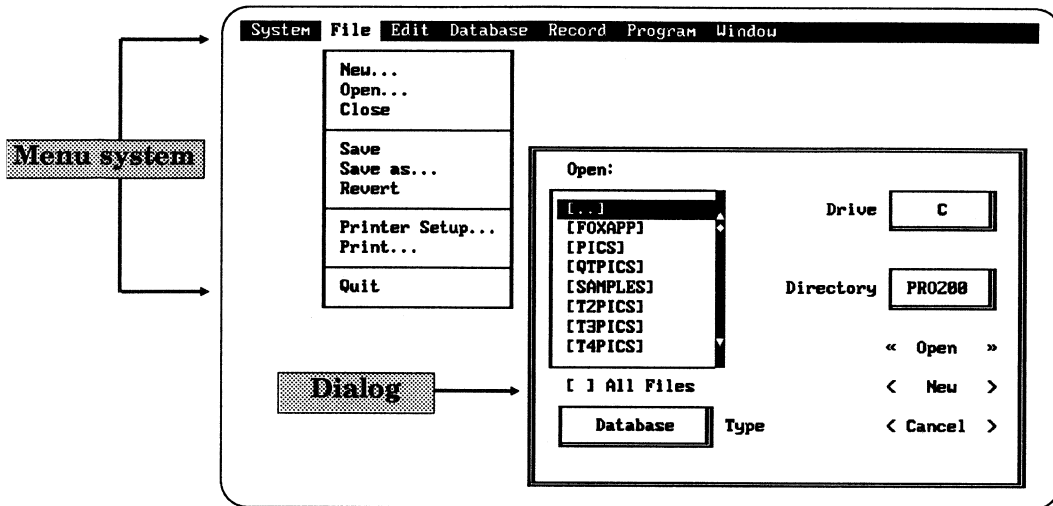
# Quick Tour

## Taking a Quick Tour

Take a quick tour of the features that make FoxPro one of the most exciting software packages in the world.

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- Browse Window . . . . . page 4
- RQBE Window . . . . . page 6
- Report Writer . . . . . page 8
- Screen Builder . . . . . page 10
- Menu Builder . . . . . page 11
- Text Editor . . . . . page 12
- Trace & Debug Windows . . . . . page 13
- Project Manager . . . . . page 14
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# Interface

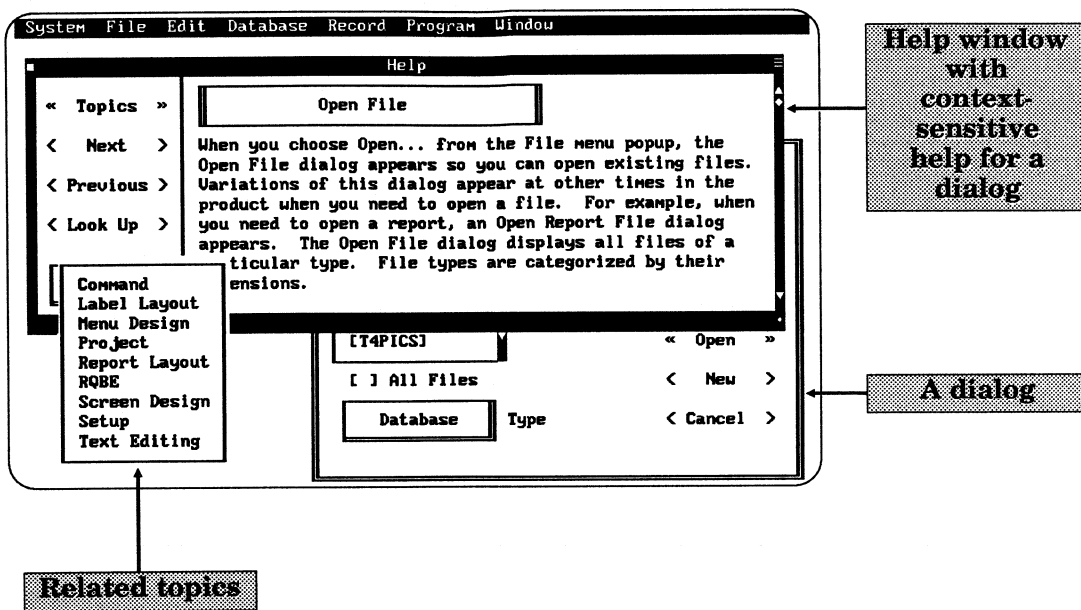


Welcome to a quick tour of FoxPro! During this tour you will see many of FoxPro's tools for managing your data. The tools help you easily create and manipulate your data, and quickly extract useful information.

Explanations of the features shown in the Quick Tour are provided throughout the FoxPro documentation.

You can communicate with FoxPro using a mouse or the keyboard, whichever you prefer. You tell FoxPro what to do by selecting items from the menu system. More specific information is communicated to FoxPro via dialogs that may contain check boxes, lists, popups, push buttons, and radio buttons.



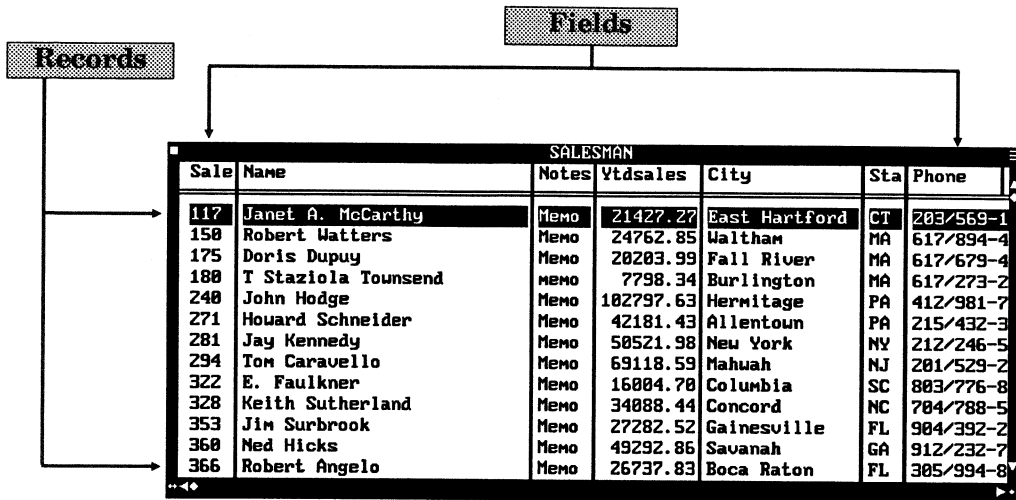


Have you ever had a question and no one was around to answer it? With FoxPro, help is always close at hand. FoxPro provides help based on what you are doing. If you ask for help while looking at a dialog, FoxPro tells you all about that particular dialog.

FoxPro even provides a handy list of related help topics.

Most actions in FoxPro take place in windows. A window can be opened, closed, moved, resized and scrolled.

# Browse Window



The Browse window is an incredible tool for viewing and editing your data.

The Browse window usually displays your data in tabular form. Each row is called a record and each column is called a field. Don't worry if you can't see every field or every record — it's easy to scroll around until you can see the data you desire.

The fields in a Browse window can be resized and rearranged to suit your needs. After you get everything where you want it, don't be afraid to close the Browse window. FoxPro remembers where everything was so that when you open the Browse window again, everything is just as you left it.

SALESMAN						
Sale	Name	Notes	City	Sta	Ytdsales	Phone
117	Janet A. McCarthy	Memo	East Hartford	CT	21427.27	203/569-1163
150	Robert Watters	Memo	Warham	MA	24762.85	617/894-4332
175	Doris Dupuy	Memo	Fall River	MA	20203.99	617/679-4071
180	T Staziola Townsend	Memo	Burlington	MA	7798.34	617/273-2904
240	John Hodge	Memo	Hermitage	PA	182797.63	412/981-7562
271	Howard Schneider	Memo	Allentown	PA	42181.43	215/432-3022
281	Jay Kennedy	Memo	New York	NY	58521.88	212/246-5348
294	Tom Caravello	Memo	Mahwah	NJ	69118.59	201/529-2831

SALESMAN.NOTES

Janet has been salesperson of the month for one consecutive month!

**Left  
partition  
in Browse  
mode**

SALESMAN						
Sale	Name	Notes	City	Sta	Ytdsales	Phone
117	Janet A. McCarthy	Memo	East Hartford	CT	21427.27	203/569-1163
150	Robert Watters	Memo	Warham	MA	24762.85	617/894-4332
175	Doris Dupuy	Memo	Fall River	MA	20203.99	617/679-4071
180	T Staziola Townsend	Memo	Burlington	MA	7798.34	617/273-2904
240	John Hodge	Memo	Hermitage	PA	182797.63	412/981-7562
271	Howard Schneider	Memo	Allentown	PA	42181.43	215/432-3022
281	Jay Kennedy	Memo	New York	NY	58521.88	212/246-5348
294	Tom Caravello	Memo	Mahwah	NJ	69118.59	201/529-2831

**Right  
partition  
in Change  
mode**

SALESMAN						
Sale	Name	Notes	City	Sta	Ytdsales	Phone
117	Janet A. McCarthy	Memo	East Hartford	CT	21427.27	203/569-1163
150	Robert Watters	Memo	Warham	MA	24762.85	617/894-4332
175	Doris Dupuy	Memo	Fall River	MA	20203.99	617/679-4071
180	T Staziola Townsend	Memo	Burlington	MA	7798.34	617/273-2904
240	John Hodge	Memo	Hermitage	PA	182797.63	412/981-7562
271	Howard Schneider	Memo	Allentown	PA	42181.43	215/432-3022
281	Jay Kennedy	Memo	New York	NY	58521.88	212/246-5348
294	Tom Caravello	Memo	Mahwah	NJ	69118.59	201/529-2831

FoxPro has a very special type of field called a memo field. Memo fields can hold data of any size and type. This makes memo fields especially well-suited for storing information that varies in size, such as descriptions, comments, letters, programs, and even binary data like pictures and digitized sounds.

If your memo field contains text, you can view it in a separate window while you browse through your data. You can also see the ASCII representation of pictures and sounds.

In addition to the tabular form of the Browse window, you can view your data in Change mode.

The Browse window can be divided into two partitions. One partition can show one portion of your data while the other partition displays another part of your data. The partitions can even be in different display modes.

# RQBE Window

RQBE - SAMPLE

Databases	Output Fields	Output To
CUSTOMER INVOICES ►SALESMAN  < Add > < Clear >	↓ 1↑ NAME      [X] Select Fields... ↓ 2↓ ITOTAL    [X] Order By... ↓ COMPANY ↓ CONTACT ↓ PHONE ↓ [ ] Group By... [ ] Having...	Browse  [ ] Options...  < See SQL > « Do Query »
Field Name	NOT	Example
↓ INVOICES.CNO ↓ SALESMAN.ONO ↓ INVOICES.ITOTAL	[ ] Like [ ] Like [ ] More Than 2500	CUSTOMER.CNO CUSTOMER.ONO 2500
		Options
		[ ] [ ] [ ]  < Insert >  < Remove >  < Or >
		Select Criteria

RQBE stands for Relational Query By Example. RQBE allows you to look at your data from many different angles. It's ease of use and quickness of response make FoxPro's RQBE facility an excellent tool for "what if" analysis.

Using the same simple interface that you've seen so far, FoxPro allows you to choose databases to retrieve information from. You can then select fields to display, specify their order and organize them in groups. You can even create conditions that records must meet to be displayed.

```

SAMPLE.QPR
SELECT SALESMAN.NAME, INVOICES.ITOTAL, CUSTOMER.COMPANY,;
CUSTOMER.CONTACT, CUSTOMER.PHONE:
FROM CUSTOMER, INVOICES, SALESMAN:
WHERE INVOICES.CNO = CUSTOMER.CNO:
AND SALESMAN.ONO = CUSTOMER.ONO:
AND INVOICES.ITOTAL > 2500:
ORDER BY SALESMAN.NAME, INVOICES.ITOTAL
INTO CURSOR SAMPLE
REPORT FORM SAMPLE.FRX PREVIEW

```

04/25/91 Top Sales by Salesman Page 1

Salesman's Name	Total	Company	Contact	Phone
Bill Diaddigo	3321.66	Uaultec Studios	Ken Bott	614/382-9499
	2615.58	Mixing Systems &	Larry Locey	219/865-6818
	5937.24			
Bob Wubben	3168.93	Univ Diego Corp	Dave Mccarthy	415/573-5167
	3824.57	Oil & Gallery	Paul Schuartz	415/426-8117
	2827.62	Hammerman Systems	Paul Dixon	213/532-2286
	2721.19	Atec Data Service	Randy Kejl	488/246-5353
	11734.31			
Carolyn Macioce	2538.18	The Automated	Ann Casey	214/631-8458
	2525.89	Herring Inc.	Bruce Smith	505/842-9778
	5063.27			
Daniel Small	3168.93	Univ Diego Corp	Dave Mccarthy	415/573-5167
	3824.57	Oil & Gallery	Paul Schuartz	415/426-8117
	2827.62	Hammerman Systems	Paul Dixon	213/532-2286
			Randy Kejl	488/246-5353

SAMPLE

Name	Itotal	Company	Contact	Phone
Bill Diaddigo	3321.66	Uaultec Studios	Ken Bott	614/382-9499
Bill Diaddigo	2615.58	Mixing Systems & Company	Larry Locey	219/865-6818
Bob Wubben	3168.93	Univ Diego Corp	Dave Mccarthy	415/573-5167
Bob Wubben	3824.57	Oil & Gallery	Paul Schuartz	415/426-8117
Bob Wubben	2827.62	Hammerman Systems	Paul Dixon	213/532-2286
Bob Wubben	2721.19	Atec Data Service	Randy Kejl	488/246-5353
Carolyn Macioce	2538.18	The Automated Associates	Ann Casey	214/631-8458
Carolyn Macioce	2525.89	Herring Inc.	Bruce Smith	505/842-9778
Daniel Small	3168.93	Univ Diego Corp	Dave Mccarthy	415/573-5167
Daniel Small	3824.57	Oil & Gallery	Paul Schuartz	415/426-8117
Daniel Small	2827.62	Hammerman Systems	Paul Dixon	213/532-2286
Daniel Small	2721.19	Atec Data Service	Randy Kejl	488/246-5353
E. Faulkner	2726.63	Comsof State DSSD	Nike Murray	305/444-7594
Fuji Retell	2538.18	The Automated Associates	Ann Casey	214/631-8458
Fuji Retell	2525.89	Herring Inc.	Bruce Smith	505/842-9778
Jan Buoniconti	3168.93	Univ Diego Corp	Dave Mccarthy	415/573-5167
Jan Buoniconti	3824.57	Oil & Gallery	Paul Schuartz	415/426-8117
Jan Buoniconti	2827.62	Hammerman Systems	Paul Dixon	213/532-2286
Jan Buoniconti	2721.19	Atec Data Service	Randy Kejl	488/246-5353
Jim Surbrook	2726.63	Comsof State DSSD	Nike Murray	305/444-7594

You can choose to send data from RQBE to a Browse window. This allows you to use all of the powerful features available with Browse windows.

You can also choose to send your data to a report. The report can be modified using FoxPro's Report Writer, which you will see on the next step of this tour.

Behind the scenes, RQBE actually creates a SQL SELECT command containing all of the items you specified. This command can be copied and used in your programs if you desire.

# Report Writer

The screenshot shows the FoxPro Report Writer interface for a report named 'SAMPLE.FRX'. The report is titled 'Top Sales by Salesman' and is currently in design mode. The interface includes a menu bar with 'R: 9 C: 7', 'Move', and 'Page Footer'. The report design is structured as follows:

Top Sales by Salesman				
Salesman's Name	Total	Company	Contact	Phone
name	itotal	company	contact	phone
	itotal			
Report Total	itotal			

The left side of the interface shows a list of report sections: PgHead, PgHead, PgHead, PgHead, PgHead, l-name, Detail, l-name, l-name, PgFoot, Summary, Summary, Summary, and Summary. The 'Detail' section is currently selected.

FoxPro's Report Writer allows you to design professional reports quickly and easily. You can place text, fields, lines and boxes anywhere in your report. This allows you to produce an infinite variety of reports.

You can use both database fields and calculated fields in a report.

Data in a report can be grouped so that totals, counts, averages, standard deviations, variances and other calculations can be computed.

A page preview option allows you to view your report on the screen before you actually print it, saving you both time and paper.

Naturally, the reports that you design can be saved, modified and used again.

04/25/91		Customer Phone List		Page	1
Company	Phone	Contact	City	St	
1st Computers	617/232-5053	Jeff W. Culbertson	Brookline	MA	
1st Data Reductions	504/524-3966	Dennis Johnson	New Orleans	LA	
1st Software Systems Ltd.	713/723-1288	Rance Sivren	Houston	TX	
1st Survey	214/243-7247	Robert Hepworth	Dallas	TX	
A Beck Pertamina	617/643-6920	Jim Ansarti	Arlington	MA	
A. Arts Computers	617/662-8157	Darryl Roudebush	Melrose	MA	
A. Bloomington Biz	904/222-9457	Phil Putnam	Tallahassee	FL	
AZ Inc	617/823-5188	Tom Totah	Taunton	MA	
Abbymark Velonex	214/922-4927	Isador Sweet	Dallas	TX	
Acres Tree Solutions	201/786-8785	Russell Knickle	Sparta	NJ	
Add Associates	415/897-2810	Len Silverman	Novato	CA	
Add Inc	303/499-2086	Bert Crawford	Boulder	CO	
Adder Incorporated	313/573-5873	Brenda Cartwright	Warren	MI	
Adv. Software	617/646-7974	Barbara H. Martin	Arlington	MA	
Advantage Computer School	408/946-1317	Duane Marshall	San Jose	CA	
Aerial Inc.	201/696-7378	Lynn Williams	Wayne	NJ	
Alex County Community	301/459-4484	Rance Hayden	Lanham	MD	
Aerial Inc.	201/696-7378	Lynn Williams	Wayne	NJ	
Alex County Community	301/459-4484	Rance Hayden	Lanham	MD	
Alex Systems	814/838-3116	Nancy Wright	Erie	PA	
American Computer Company	806/799-7706	Dick W Guyton	Lubbock	TX	
American Forum	805/682-5580	Gui Dupuy	Santa Barbara	CA	
American Innovations	201/245-7517	Garret Hill	Roselle	NJ	

04/25/91		Top Sales by Salesman			Page	1
Salesman's Name	Total	Company	Contact	Phone		
Bill Diaddigo	3321.66	Vaultec Studies	Ken Bott	614/382-9499		
	2615.58	Mixing Systems &	Larry Locey	219/865-6010		
	5937.24					
Bob Wubben	3160.93	Univ Diego Corp	Dave Mccarthy	415/573-5167		
	3024.57	Oil & Gallery	Paul Schuartz	415/426-8117		
	2827.62	Hammerman Systems	Paul Dixon	213/532-2286		
	2721.19	Atec Data Service	Randy Keji	408/246-5353		
	11734.31					
Carolyn Macioce	2538.18	The Automated	Ann Casey	214/631-8458		
	2525.09	Herring Inc.	Bruce Smith	505/842-9770		
	5063.27					
Daniel Small	3160.93	Univ Diego Corp	Dave Mccarthy	415/573-5167		
	3024.57	Oil & Gallery	Paul Schuartz	415/426-8117		
	2827.62	Hammerman Systems	Paul Dixon	213/532-2286		
	2721.19	Atec Data Service	Randy Keji	408/246-5353		
	11734.31					
E. Faulkner	2726.63	Comsof State DSSD	Mike Murray	305/444-7594		
	2726.63					
	5453.26					
Fuji Retell	2538.18	The Automated	Ann Casey	214/631-8458		
	2525.09	Herring Inc.	Bruce Smith	505/842-9770		
	5063.27					
Jan Buoniconti	3160.93	Univ Diego Corp	Dave Mccarthy	415/573-5167		
	3024.57	Oil & Gallery	Paul Schuartz	415/426-8117		
	2827.62	Hammerman Systems	Paul Dixon	213/532-2286		
	2721.19	Atec Data Service	Randy Keji	408/246-5353		

# Screen Builder

— Laserdisk Library —

Title	1900 - A Film By Bernardo Be	Deleted: No	Record#	393
Catalog#	LU8804-3			
Price	49.95			
Acquired	10/11/90	Sides	5	
U. Quality	8	Duration	255	
Critics	7	Year	1977	

Comments  
This is a good movie.

<input type="text" value="NC-17"/>	Rating	<input checked="" type="checkbox"/> Digital transfer	<input type="checkbox"/> CAU format
<input type="text" value="Paramount"/>	Studio	<input type="checkbox"/> Digital audio	<input type="checkbox"/> Black and white
<input type="text" value="Title"/>	Order	<input type="checkbox"/> Stereo	<input type="checkbox"/> Subtitled
		<input type="checkbox"/> Surround sound	<input type="checkbox"/> Dubbed
		<input checked="" type="checkbox"/> CX encoded	<input type="checkbox"/> Silent
		<input type="checkbox"/> Closed captioned	<input type="checkbox"/> Commentary
		<input type="checkbox"/> Letterboxed	<input type="checkbox"/> Supplements

< Top > < Prior > < Next > < Bottom > < Quit >

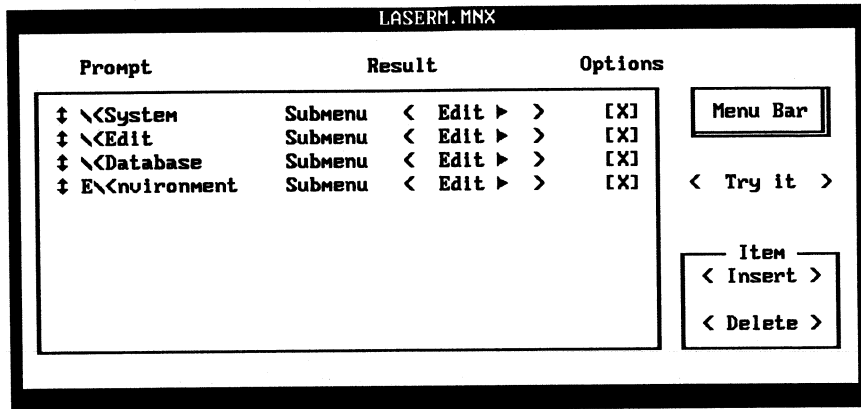
FoxPro's Screen Builder allows you to design screens for entering and editing your data.

Your screens can contain the same controls used in FoxPro's interface. These controls include push buttons, radio buttons, invisible buttons, check boxes, popups, lists, text edit regions, text, lines and boxes.

FoxPro takes the information supplied by the Screen Builder and generates a program.



# Menu Builder



Designing custom menu systems is a snap with FoxPro's Menu Builder. You can create menus that include your own options as well as some or all of the options from FoxPro's menus.

FoxPro uses information you specify in the Menu Builder to generate a program.

You can coordinate screens and menus in applications that you write.

# Text Editor

The screenshot displays three overlapping windows in the FoxPro text editor:

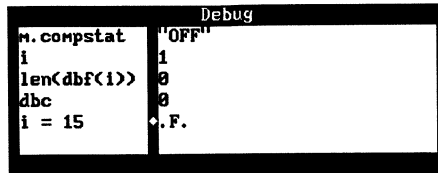
- PICTURE.PRG**: Contains the following code:

```
if !(' PICTLOW' $abf<>)
  close all
  use pictlow
endif
set library to imagelib
define window picture from
  title "Press F2 to Disp
  float grow close zoom s
  color scheme 8
on key label f2 do disppic
browse nowait window pictu
```
- ROBE.TXT**: Contains a numbered list of instructions:
  1. In the command window type CLOSE ALL
  2. From the File menu popup select Neu...
  3. From the New dialog select Query
  4. Select the Cust database from the Open file dialog
  5. In the ROBE window select the Select Fields... check box.
  6. In the Select Fields dialog Remove All the fields and add the fields cust.cno,
- OUT4.TXT**: Displays a report titled "Invoice Report" with the following data:

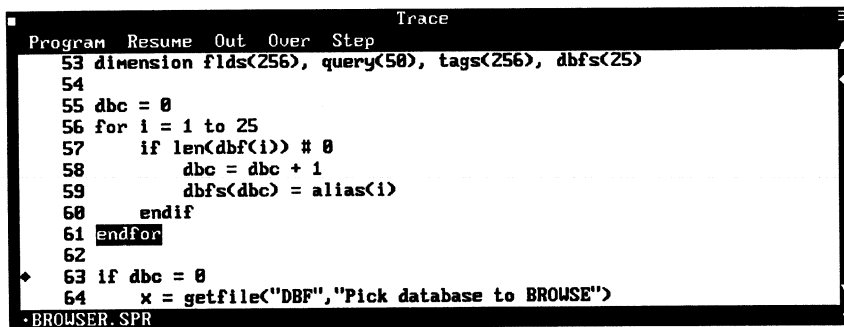
Company	Phone	Contact	Date
Atec Data Service	408/246-5353	Randy Keji	05/17/90
Automated Mayo Miley	714/540-6062	Bill Hopkins	05/08/90

FoxPro's built-in text editor does more than just allow you to type and modify text. You can also cut, copy, and paste both within a file and between files. FoxPro's text editor includes search and replace, word wrap, auto indentation, justification, undo/redo and a handy status line.

# Trace & Debug



	Debug
n.compstat	"OFF"
i	1
len(dbf(i))	0
dbc	0
i = 15	.F.



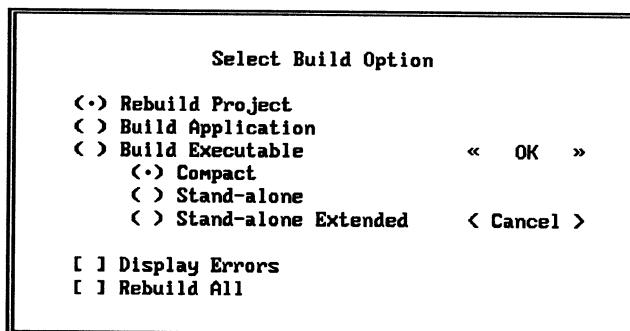
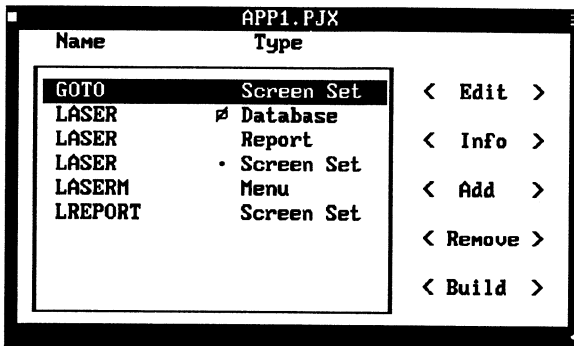
```
Trace
Program Resume Out Over Step
53 dimension flds(256), query(50), tags(256), dbfs(25)
54
55 dbc = 0
56 for i = 1 to 25
57     if len(dbf(i)) # 0
58         dbc = dbc + 1
59         dbfs dbc = alias(i)
60     endif
61 endfor
62
63 if dbc = 0
64     x = getfile("DBF","Pick database to BROWSE")
·BROWSER.SPR
```

FoxPro's Trace window allows you to watch program code as it executes. You can let your program execute normally, step through the code one line at a time, or set breakpoints to stop execution on certain lines.

The Debug window allows you to monitor the values of variables and expressions while your program is executing. You can set breakpoints based on specific variable values.

Editing, Trace and Debug windows are an unbeatable team for program development.

# Project Manager



To help you keep track of your databases, queries, reports, screens, menus and programs, FoxPro provides the Project Manager. The project manager unifies and coordinates the elements of a FoxPro application.

The Project Manager remembers the location and current version of every file it contains. It also allows easy access to prewritten programs and interface components.

Distribution of both application files and executable (.EXE) files is highly streamlined when you use the Project Manager.

# Wrapping it up

As you can see, FoxPro is a database system of remarkable breadth and depth.

Beginners can simply and swiftly tap FoxPro's amazingly powerful facilities to interactively create *ad-hoc* queries, reports, data input screens and even entire applications.

Yet FoxPro has the depth to satisfy the most demanding developer or corporate power-user. FoxPro has the speed to outrun mainframe databases and handle millions of records (one of our sites actually has databases of nearly 100 million records).

*PC Magazine* styled FoxPro a "developer's dream" and we agree wholeheartedly.

With FoxPro, you'll never lack room to grow.



## Groundwork

Starting FoxPro and using the interface is a snap. In this chapter, you'll learn the basics.

- Welcome . . . . . page 2
- Starting FoxPro . . . . . page 3
- Mouse Techniques . . . . . page 4
- Menu System . . . . . page 5
- Windows . . . . . page 6
- Dialogs . . . . . page 8
- On-Line Help . . . . . page 10
- Text Editing . . . . . page 12

## Welcome

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Welcome to the FoxPro tutorial. Please, sit down and relax. Take your shoes off if you want to. Get ready to make your life easier.

The first few pages of this tutorial familiarize you with the FoxPro interface. If you need more information about the interface, refer to the Interface Basics chapter in the FoxPro *Interface Guide*. The sessions that follow show you how to use FoxPro's tools to enter, manipulate and report your data.

By the time you are finished with this tutorial, FoxPro will not be just another software package. You will wonder how you survived without it.



## Starting FoxPro

---

### Starting FoxPro

1. Turn on your computer.
2. If you have not installed FoxPro, do so now.
3. Go to the directory in which you installed FoxPro.
4. Type `FOX` and press Enter. The FoxPro sign-on screen appears with the Command window open.



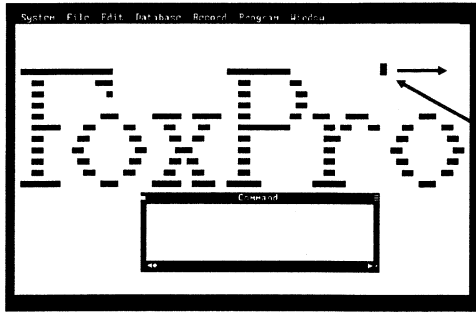
### Exiting FoxPro

When you are ready to exit FoxPro, choose **Quit** from the **File** menu popup. You are back to the system prompt.

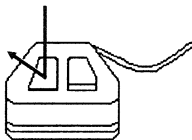
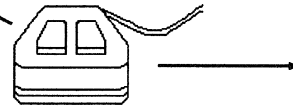
## Mouse Techniques

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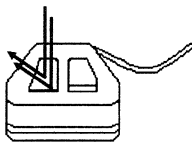
Here are some common mouse techniques. For additional information about mouse use, refer to the Interface Basics chapter in the FoxPro *Interface Guide*.



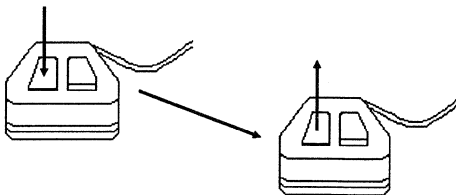
**Point** – Position the pointer at a specific location on the screen. When you move the mouse, the pointer moves in a similar manner.



**Click** – Point to an object then press and release the mouse button once.



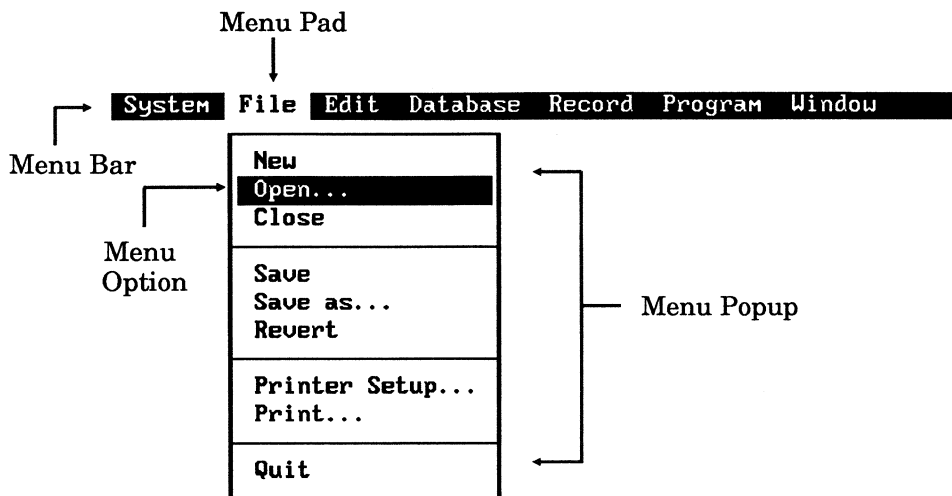
**Double-click** – Point to an object then press and release the mouse button twice in rapid succession.



**Drag** – Hold the mouse button down, roll the mouse until the pointer is in the desired location and release the mouse button.

## Menu System

The menu system makes it easy for you to communicate with FoxPro without programming. The parts of the menu system are shown below, along with steps for choosing menu options.



### Choosing Menu Options

With the keyboard:

1. Press the Alt key to select the first menu pad, then press the Right or Left Arrow keys to select other menu pads on the menu bar.
2. Press Enter to display the menu popup.
3. Press the Up or Down Arrow keys to select an option, then press Enter to choose the option.

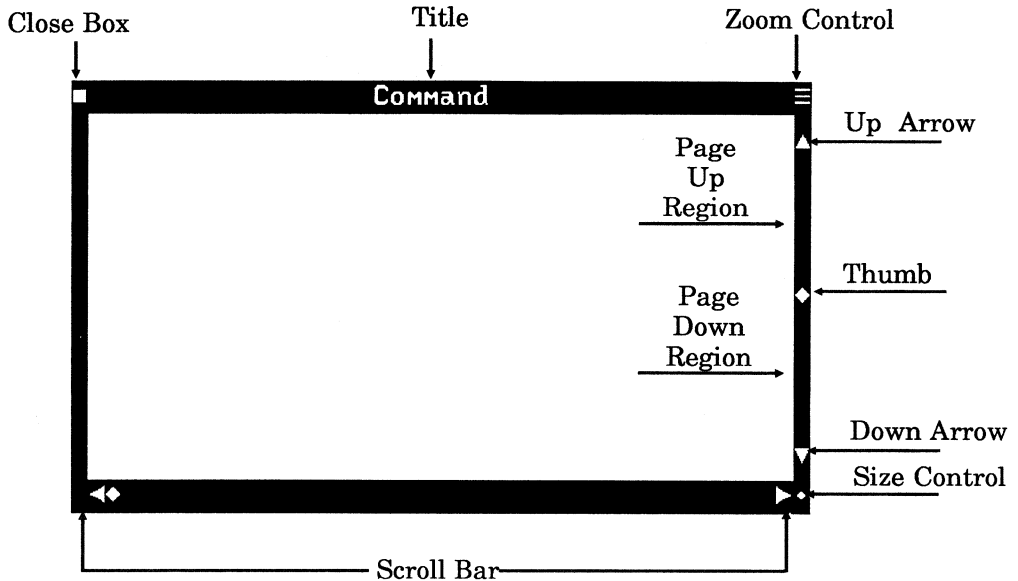
With the mouse:

1. Point to the menu pad and press the left mouse button to display the menu popup.
2. Point to the desired option and press the left mouse button.

## Windows

---

FoxPro windows display text files, programs, data, help information and many other kinds of information. You can manipulate windows in a variety of ways.



### Moving a Window

With the keyboard:

1. Choose **Move** from the **Window** menu popup. The window border flashes.
2. Press the arrow keys, PgUp, PgDn, Home and End keys to move the window, then press Enter.

With the mouse:

Point to the window title, drag the window to the desired location and release the mouse button.

### Sizing a Window

With the keyboard:

- Choose **Size** from the **Window** menu popup. Press the Left, Right, Up and Down Arrow keys to move the border of the window. When the window is the size you want, press Enter.
- To enlarge the window to full size, choose **Zoom ↑** from the **Window** menu popup. Choose **Zoom ↑** again to return the window to its previous size.

With the mouse:

- Point to the *size control* and drag until the window is the desired size.
- To enlarge the window to full size, click on the window's *zoom control*. Click again to return the window to its previous size.

### Scrolling a Window

With the keyboard:

- Press the Down Arrow key to scroll down or press the Up Arrow key to scroll toward the top of the window.
- To scroll rapidly, press the PgUp key to display the previous window full and the PgDn key to display the next window full of text.

With the mouse:

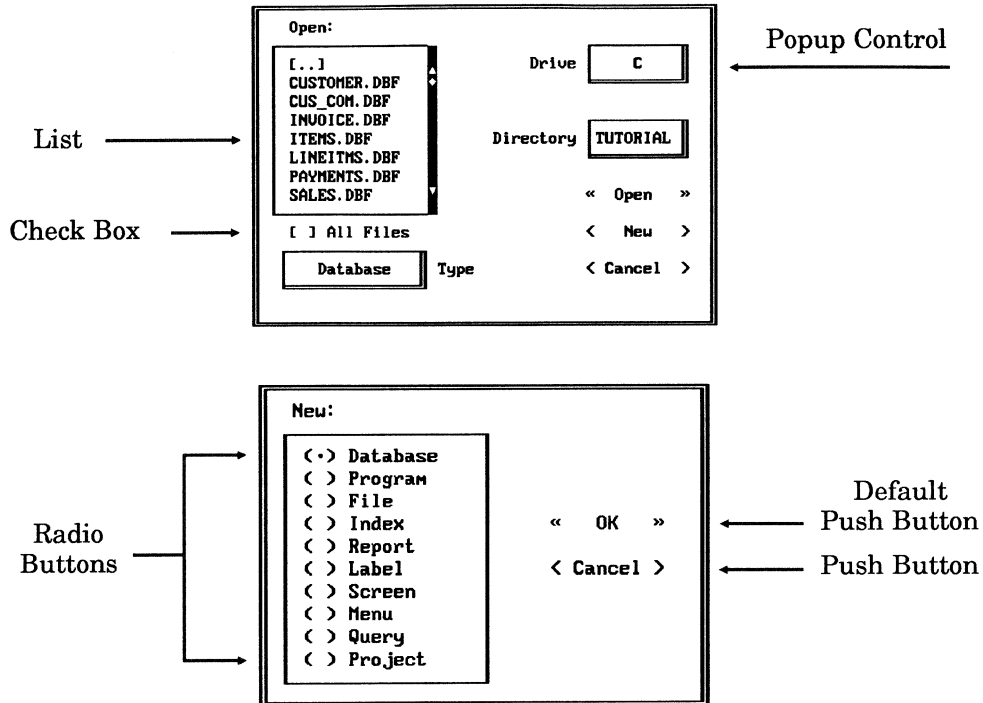
- Click on the up or down arrow on the scroll bar to move through the text a line at a time. Click on the Page Up or Page Down region to move through the text a screen at a time. Click and hold the mouse button down on the arrow to scroll continuously.
- To scroll rapidly, point to the *thumb* and drag it up or down.

### Closing a Window

Choose **Close** from the **File** menu popup or click on the window's close box.

## Dialogs

Dialogs are special boxes that allow you to make choices concerning an action about to take place.



### Scrolling a List

With the keyboard:

Tab to the list, then keep pressing the Down Arrow key. Use the Up Arrow key to scroll toward the top of the list.

With the mouse:

Click on the up or down arrow on the scroll bar. If you hold the mouse button down, scrolling will continue until you release the mouse button.

**Choosing an Option on a Popup**

With the keyboard:

1. Tab to the popup control, then press Enter to display the popup.
2. Press the Up or Down Arrow keys to select the option then press Enter.

With the mouse:

1. Point to the popup control and press the mouse button to display the popup.
2. Drag to the desired option, then release the mouse button.

**Choosing a Check Box, Radio Button, Push Button**

With the keyboard:

Tab to the check box, radio button or push button, then press Enter.

With the mouse:

Point to the check box, radio button or push button and click.

**Moving a Dialog**

With the keyboard:

1. Press Ctrl+F7 then use the arrow keys, PgUp, PgDn, Home or End keys to move the dialog in any direction.
2. When the dialog is where you want it, press Enter.

With the mouse:

Point to the top border of the dialog, drag the dialog to the desired location and release the mouse button.

## On-Line Help

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With FoxPro, help information is at your fingertips. FoxPro provides context-sensitive help so that you can get help information about any system window, dialog or menu option while you are using that feature.

### Accessing Context-Sensitive Help

With the keyboard:

When the window or dialog is frontmost or the menu option is selected, press the F1 key.

With the mouse:

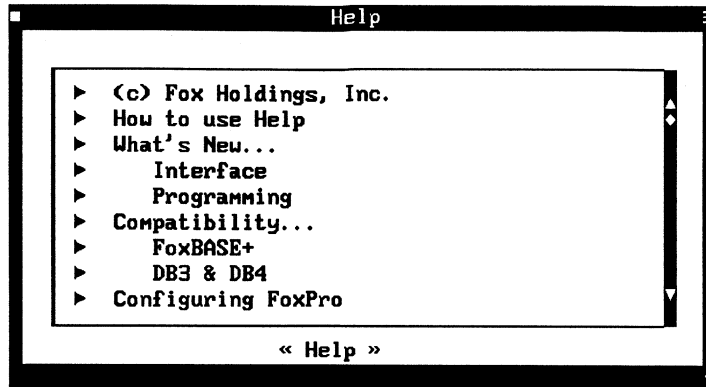
Hold down the Alt key, point to the window, dialog or menu option and click the left mouse button.

If you prefer, you can scroll through the topics list in the Help window and get help on a topic.

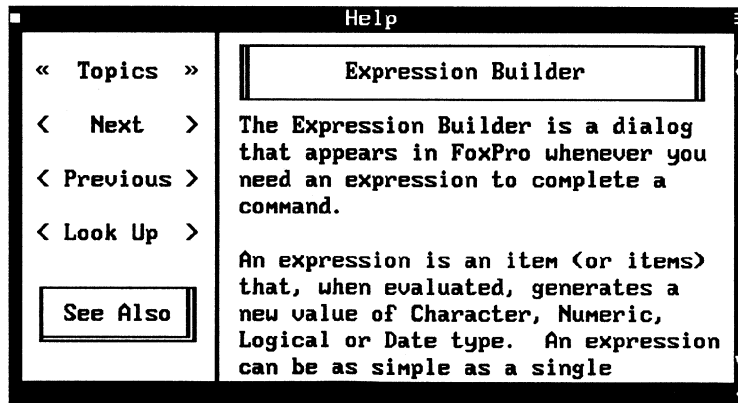
### Getting Help Details for a Topic

1. Choose **Help...** from the **System** menu popup or press F1.
2. Select the topic from the Help window that you want help information about.
3. Choose the **Help** push button at the bottom of the Help window.





**Topics Level of the Help Window**



**Details Level of the Help Window**

## Text Editing

---

Editing text in FoxPro is done with a mouse or eight basic cursor movement keys, two modifier keys and two delete keys.

You can use these techniques whenever you type information with your keyboard.

<b>Cursor Movements</b>	
Right Arrow	Move one character to the right
Left Arrow	Move one character to the left
Up Arrow	Move up one line
Down Arrow	Move down one line
Home	Move to the start of the line
End	Move to the end of the line
PgUp	Move up one window-full of text
PgDn	Move down one window-full of text
Ctrl+Right Arrow	Move one word right
Ctrl+Left Arrow	Move one word left
Ctrl+Home	Move to the beginning of text
Ctrl+End	Move to the end of text

<b>Select Text with Keyboard</b>	
Shift Arrow Keys	Select a range of characters
Shift+Ctrl Arrow Keys	Select a range of words
Shift+Ctrl+Home	Select from cursor to beginning of text
Shift+Ctrl+End	Select from cursor to end of text
Ctrl+A (a menu shortcut)	Select entire document

<b>Select Text with Mouse</b>	
Drag	Select a range of characters
Double-click	Select a word
Double-click and drag	Select a range of words
Triple-click	Select a line
Triple-click and drag	Select a range of lines

<b>Delete and Replace</b>	
Place cursor to the right of the character, press Backspace, or place cursor at the character, press Delete	Delete a character
Place cursor anywhere in word, press Ctrl+Backspace	Delete a word
Select and press Backspace	Delete a selection
Select text to be replaced, type new text (or Paste)	Replace existing text

<b>Cut, Copy and Paste</b>	
Select the text, press Ctrl+X or use <b>Cut</b> in the <b>Edit</b> menu	Cut Text
Select the text, press Ctrl+C or use <b>Copy</b> in the <b>Edit</b> menu	Copy Text
Press Ctrl+V or use <b>Paste</b> in the <b>Edit</b> menu	Paste at cursor
Select text, press Ctrl+V or use <b>Paste</b> in the <b>Edit</b> menu	Replace text with clipboard content



# Session 1

## Looking at Your Data

In this session you'll see how easy it is to open a database and look at its information using FoxPro's multi-faceted Browse window.

- Opening a database . . . . . page 2
- Browsing a database . . . . . page 2
- Modifying the Browse window . . . . page 6
- Opening a memo field . . . . . page 20

## Looking at Your Data

---

Now that you can navigate around the FoxPro interface, let's use those skills.

We have provided several databases for your use when learning FoxPro. A database is a file that contains a collection of information. These files are sometimes referred to as .DBF files or tables.

One of the databases provided, CUSTOMER.DBF, contains information regarding a set of rather eccentrically named, fictitious customers. This is one of six sample databases provided that relate to the operations of a simple (eccentrically managed) imaginary business.

FoxPro contains a very powerful tool for viewing and editing database information called a Browse window. Let's open CUSTOMER.DBF and look at the customer information in a Browse window.

### Opening and Browsing a Database

1. Choose **Open...** from the **File** menu popup. The Open File dialog appears. Make sure that **C** shows on the **Drive** popup control and **TUTORIAL** shows on the **Directory** popup control. (Figure 1)
2. Select CUSTOMER.DBF.
3. Choose the **Open** push button.
4. Choose **Browse** from the **Database** menu popup. The Browse window appears as in Figure 2.

As you can see, the Browse window displays information in rows and columns. The rows are called records and the columns are called fields.

- Fields contain a certain type of information. For instance, CUSTOMER.DBF has a field called CNO that contains the customer number for each customer.
- A record is a set of fields that define a specific person, place or thing. In CUSTOMER.DBF, each record contains information for one customer.

A database file is simply a collection of records.

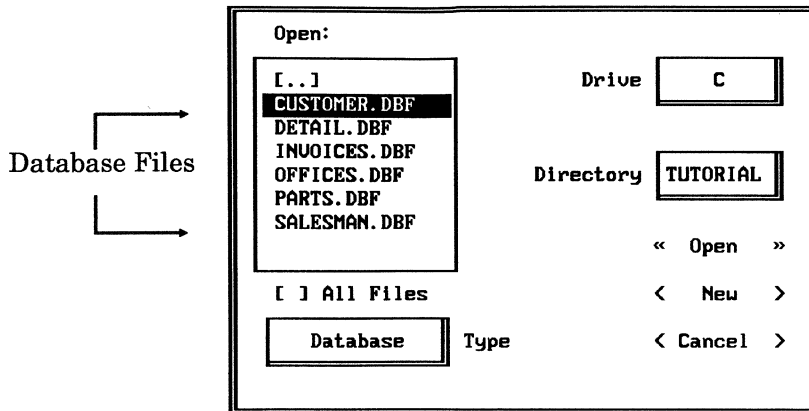


Figure 1: Open File Dialog

CUSTOMER		
Cno	Company	Contact
14021	1st Computers	Jeff W. Culbert
18232	1st Data Reductions	Dennis Johnson
12082	1st Software Systems Ltd.	Rance Sivren
12840	1st Survey	Robert Hepworth
A8872	A Beck Pertamina	Jim Ansarti
A8818	A. Arts Computers	Darryl Roudebus
A6459	A. Bloomington Biz	Phil Putnam
A6188	AZ Inc	Tom Totah
A5181	Abbymark Uelonex	Isador Sweet
A3964	Acres Tree Solutions	Russell Kmickle
A3882	Add Associates	Len Silverman
A1046	Add Inc	Bert Crauford
A7249	Adder Incorporated	Brenda Carturig
A3835	Adv. Software	Barbara H. Mart

Figure 2: Browse Window for CUSTOMER.DBF

A Browse window isn't normally big enough to enable you to see all the fields and records in a database at once. Think of the Browse window as a viewport to the entire database file, as demonstrated in Figure 3.

You can scroll the Browse window horizontally and vertically to see different portions of the database. Figure 3 illustrates this concept.

The Browse window has the standard window controls described in Groundwork. Note that the title of the Browse window is the name of the database file that you are browsing. Try moving, sizing and scrolling the Browse window. Go ahead, take it for a test drive.

### **Moving, Sizing and Scrolling the Browse Window**

1. Move the Browse window down a few lines on the screen.
2. Size the Browse window so that it covers the entire screen.
3. Scroll right to see the remaining fields in CUSTOMER.DBF.



Fields

CUSTOMER				
Cno	Company	Contact	Address	City
14021	1st Computers	Jeff W. Culbertson	5111 Parkway	Brookline
18232	1st Data Reductions	Dennis Johnson	360 Riverview Farm Street	New Orleans
12082	1st Software Systems Ltd.	Rance Sivren	23433 Chapel 121	Houston
12848	1st Survey	Robert Hepuorth	733 Peeler 86th	Dallas
A8872	A Beck Pertamina	Jim Ansarti	4001 Ste	Arlington
A8818	A. Arts Computers	Darryl Roudebus	3305 Plantation Avenue	Melrose
A6453	A. Bloomington Biz	Phil Putnam	6300 East Drive	Talahase
A6188	AZ Inc	Tom Totah	2041 Wilshire Blvd Avenue	Taunton
A5181	Abbymark Velonex	Isador Sweet	2139 Bridge Sciller	Dallas
A3964	Acres Tree Solutions	Russell Kwickle	621 Ferrndale Ste Park	Sparta
A3882	Add Associates	Len Silverman	318 N Sante Fe Ave Officell	Novato
A1046	Add Inc	Bert Crauford	253 Mitchell St	Boulder
A7249	Adder Incorporated	Brenda Cartwright	1237 Bering Belleview	Warren
A3835	Adv. Software	Barbara H. Martin	600 114th Ave Se Ste A1a	Arlington
			3784 Van Dyke Suite Street	San Jose
A0169	Aerial Inc.	Lynn Williams	903 Highland Drive	Wayne
A8902	Alex County Community Corp	Rance Hayden	75 Briar Ave	Langham
A2418	Alex Systems	Nancy Wright	2416 Idaho Place S.	Erie
A8887	American Computer Company	Dick W Guyton	199 E Main A1a	Lubbock
A8839	American Forum	Gui Dupuy	Second Motor Seward	Santa Barbara
A9409	American Innovations	Garret Hill	Woodland House Ave Zussman	Roselle
A4268	Ansari Data Software	Wallace Campanelli	Black Tower Drive Ste Court	Pittsburg
A6992	Ansari Produce	Oliver Mossangan	648401 Hunting Ridge Ave	Spring Valley
A0516	Applied Telephone Realtors	Michael Cumming	2232 Carlton Hills Place	Newton Square
A4062	Aspen Planning & Inc.	Gary Erickson	148 Charleston Avenue	Tulsa
A8040	Aspen Technology	Mel Colby	301 Broaduay Suite Place	DeWitt
A8040	Assoc American Chimney Survey	Elizebeth Pitts	121 Lady Ellen 1267	Excelsior
A7319	Assoc Strong	Dick May	11430 St	Belleville
A2695	Atec Data Service	Randy Keji	4206 S Hardy Drive Ave	Santa Clara
A9541	Automated Mayo Miley	Bill Hopkins	521 Whitney 415	Orange
A6294	Award Ammonia Greenhouses	Tony Lee	Box South Court	Boston
A6223	Azinuth Bavis & Systems	Chuck Heitmeier	17610 Conesus Lake Avenue	San Francisco

Records

Figure 3: Browse Window Displaying a Portion of the Database

You can also adjust the way data is displayed in the Browse window. For instance, individual fields in a Browse window may be resized. Let's try making the COMPANY field smaller so that you can see more of the other fields.

### **Sizing a Field**

With the keyboard:

1. If the COMPANY field isn't selected, Tab to it. Choose **Size Field** from the **Browse** menu popup.
2. Use the Left Arrow key to shorten the field, then press Enter.

With the mouse:

Point to the line between the CONTACT field and the COMPANY field, press the mouse button and drag. Release the mouse when the field is the width you want.

Figure 4 shows the resized COMPANY field.

It is important to note that you are just changing the way the data *appears*. You are in no way affecting the way data is stored in the database file.

The diagram illustrates a 'Resized Field' in a 'CUSTOMER' table. The top table shows the original state with narrow columns. The bottom table shows the state after the 'Address' column is resized, with arrows indicating the change and the text 'Resized Field'.

CUSTOMER			
Cno	Company	Contact	Address
14021	1st Computers	Jeff W. Culbertson	5111 Parkway
18232	1st Data Reductions	Dennis Johnson	360 Riverview
12082	1st Software Systems Ltd.	Rance Sivren	23433 Chapel 1
12840	1st Survey	Robert Hepuorth	733 Peeler 86t
A8872	A Beck Pertamina	Jim Ansarti	4001 Ste
A8818	A. Arts Computers	Darryl Roudebush	3305 Plantatio
A6459	A. Bloomington Biz	Phil Putnam	6300 East Driv
A6188	AZ Inc	Tom Totah	2041 Wilshire
A5181	Abbymark Uelonex	Isador Sweet	2139 Bridge Sc
A3964	Acres Tree Solutions	Russell Kmickle	621 Ferndale S
A3882	Add Associates	Len Silverman	318 N Sante Fe
A1046	Add Inc	Bert Crauford	253 Mitchell S
A7249	Adder Incorporated	Brenda Carturight	1237 Bering Be
A3835	Adv. Software	Barbara H. Martin	600 114th Ave

Resized Field

CUSTOMER			
Cno	Company	Contact	Address
14021	1st Computers	Jeff W. Culbertson	5111 Parkway
18232	1st Data Reductions	Dennis Johnson	360 Riverview Farm Street
12082	1st Software Systems Ltd.	Rance Sivren	23433 Chapel 121
12840	1st Survey	Robert Hepuorth	733 Peeler 86th
A8872	A Beck Pertamina	Jim Ansarti	4001 Rowed Rd
A8818	A. Arts Computers	Darryl Roudebush	3305 Plantation Avenue
A6459	A. Bloomington Biz	Phil Putnam	6300 East Drive
A6188	AZ Inc	Tom Totah	2041 Wilshire Blud
A5181	Abbymark Uelonex	Isador Sweet	2139 Bridge Sciller
A3964	Acres Tree Solutions	Russell Kmickle	621 Ferndale Ste Park
A3882	Add Associates	Len Silverman	318 N Sante Fe Ave Office
A1046	Add Inc	Bert Crauford	253 Mitchell St
A7249	Adder Incorporated	Brenda Carturight	1237 Bering Belleview
A3835	Adv. Software	Barbara H. Martin	600 114th Ave Se Aia

Figure 4: Browse Window with Field Resized

Another way to change the way your data is displayed is to rearrange the order of the fields. Why don't you move some of the fields around so you can see some important information?

### **Moving Fields**

**With the keyboard:**

1. If the CNO field isn't selected, Tab to it. Choose **Move Field** from the **Browse** menu popup.
2. Press the Right Arrow key until CNO appears between COMPANY and CONTACT, then press Enter.

**With the mouse:**

Point to CNO, press the mouse button and drag CNO until it is located between COMPANY and CONTACT.

Figure 5 shows the relocated CNO field.

CUSTOMER			
Cno	Company	Contact	Address
14021	1st Computers	Jeff W. Culbertson	5111 Parkway
18232	1st Data Reductions	Dennis Johnson	360 Riverview Farm Street
12082	1st Software Systems Ltd.	Rance Sivren	23433 Chapel 121
12840	1st Survey	Robert Hepuorth	733 Peeler 86th
A8872	A Beck Pertamina	Jim Ansarti	4001 Rowed Rd
A8818	A. Arts Computers	Darryl Roudebush	3305 Plantation Avenue
A6459	A. Bloomington Biz	Phil Putnam	6300 East Drive
A6188	AZ Inc	Tom Totah	2041 Wilshire Blvd
A5181	Abbymark Uelonex	Isador Sweet	2139 Bridge Sciller
A3964	Acres Tree Solutions	Russell Kmickle	621 Ferndale Ste Park
A3882	Add Associates	Len Silverman	318 N Sante Fe Ave Office
A1046	Add Inc	Bert Crauford	253 Mitchell St
A7249	Adder Incorporated	Brenda Carturight	1237 Bering Belleview
A3835	Adv. Software	Barbara H. Martin	600 114th Ave Se Ala

Moved Field

CUSTOMER			
Company	Cno	Contact	Address
1st Computers	14021	Jeff W. Culbertson	5111 Parkway
1st Data Reductions	18232	Dennis Johnson	360 Riverview Farm Street
1st Software Systems Ltd.	12082	Rance Sivren	23433 Chapel 121
1st Survey	12840	Robert Hepuorth	733 Peeler 86th
A Beck Pertamina	A8872	Jim Ansarti	4001 Rowed Rd
A. Arts Computers	A8818	Darryl Roudebush	3305 Plantation Avenue
A. Bloomington Biz	A6459	Phil Putnam	6300 East Drive
AZ Inc	A6188	Tom Totah	2041 Wilshire Blvd
Abbymark Uelonex	A5181	Isador Sweet	2139 Bridge Sciller
Acres Tree Solutions	A3964	Russell Kmickle	621 Ferndale Ste Park
Add Associates	A3882	Len Silverman	318 N Sante Fe Ave Office
Add Inc	A1046	Bert Crauford	253 Mitchell St
Adder Incorporated	A7249	Brenda Carturight	1237 Bering Belleview
Adv. Software	A3835	Barbara H. Martin	600 114th Ave Se Ala

Figure 5: Browse Window with Field Moved

“What if I want to see all of my fields at the same time?” you may ask. With FoxPro, it’s no problem! Just switch the Browse window to Change mode.

#### **Viewing Data in Change Mode**

1. Choose **Change** from the **Browse** menu popup. The Browse window appears in Change mode. (Figure 6)
2. Scroll through some records.

In Change mode, you can see all of the fields in CUSTOMER.DBF at once. You can toggle back and forth between Browse and Change modes at will. Exercise your will and return to Browse mode.

#### **Returning to Browse Mode**

Choose **Browse** from the **Browse** menu popup.

CUSTOMER	
Company	1st Computers
Cno	14021
Contact	Jeff W. Culbertson
Address	5111 Parkway
City	Brookline
State	MA
Zip	02146
Phone	617/232-5053
Ono	1
Ytdpurch	1509.67
Lat	42.3396
Long	71.1149
<hr/>	
Company	1st Data Reductions
Cno	18232
Contact	Dennis Johnson

Figure 6: Browse Window in Change Mode

Another useful way to look at data is to split the Browse window into two partitions. Now you can use the little control in the lower left corner of the Browse window that you've been wondering about since the beginning of this session. This control is called the window splitter.

### Splitting the Browse Window

With the keyboard:

1. Choose **Resize Partitions** from the **Browse** menu popup, then press the Right Arrow key until you see two COMPANY fields then a second CNO field. (Figure 7)
2. In the right partition, scroll to the right to see more fields. (Figure 8)

With the mouse:

1. Point to the window splitter and drag it to the right until you see two COMPANY fields then a second CNO field. Release the mouse button. (Figure 7)
2. In the right partition, scroll to the right to see more fields. (Figure 8)



CUSTOMER				
Company	Cno	Company	Cno	Contact
1st Computers	14021	1st Computers	14021	Jeff W.
1st Data Reductions	18232	1st Data Reductions	18232	Dennis
1st Software Systems Ltd.	12082	1st Software Systems Ltd.	12082	Rance S
1st Survey	12840	1st Survey	12840	Robert
A Beck Pertamina	A8872	A Beck Pertamina	A8872	Jim Ans
A. Arts Computers	A8818	A. Arts Computers	A8818	Darryl
A. Bloomington Biz	A6459	A. Bloomington Biz	A6459	Phil Pu
AZ Inc	A6188	AZ Inc	A6188	Tom Tot
Abbymark Velonex	A5181	Abbymark Velonex	A5181	Isador
Acres Tree Solutions	A3964	Acres Tree Solutions	A3964	Russell
Add Associates	A3882	Add Associates	A3882	Len Sil
Add Inc	A1046	Add Inc	A1046	Bert Cr
Adder Incorporated	A7249	Adder Incorporated	A7249	Brenda
Adv. Software	A3835	Adv. Software	A3835	Barbara

Window Splitter

Figure 7: Browse Window Split into Two Partitions

CUSTOMER					
Company	Cno	City	State	Zip	Phone
1st Computers	14021	Brookline	MA	02146	617/232-5053
1st Data Reductions	18232	New Orleans	LA	70113	504/524-3966
1st Software Systems Ltd.	12082	Houston	TX	77035	713/723-1288
1st Survey	12840	Dallas	TX	75234	214/243-7247
A Beck Pertamina	A8872	Arlington	MA	02174	617/643-6920
A. Arts Computers	A8818	Melrose	MA	02176	617/662-0157
A. Bloomington Biz	A6459	Tallahassee	FL	32301	904/222-9457
AZ Inc	A6188	Taunton	MA	02780	617/823-5180
Abbymark Velonex	A5181	Dallas	TX	75201	214/922-4927
Acres Tree Solutions	A3964	Sparta	NJ	07871	201/786-0785
Add Associates	A3882	Novato	CA	94947	415/897-2810
Add Inc	A1046	Boulder	CO	80303	303/499-2086
Adder Incorporated	A7249	Warren	MI	48093	313/573-5873
Adv. Software	A3835	Arlington	MA	02174	617/646-7974

Left Partition

Right Partition

Figure 8: Browse Window with Right Partition Scrolled

Perhaps you're wondering why you would want to split the Browse window. Wonder no longer! You can:

- Scroll through the fields in one partition without moving the fields in the other partition.
- Change the mode of one partition to Change mode while leaving the other partition in Browse mode.

### Selecting a Partition and Changing its Mode

With the keyboard:

1. If the right partition is not selected, choose **Change Partition** from the **Browse** menu popup.
2. Choose **Change** from the **Browse** menu popup, then scroll through records with the Up and Down Arrow keys. (Figure 9)

With the mouse:

1. Point to the right partition and click.
2. Choose **Change** from the **Browse** menu popup, then scroll through records with the Up and Down Arrow keys. (Figure 9)

Notice that the same record is selected in both partitions as you scroll because the partitions are linked.

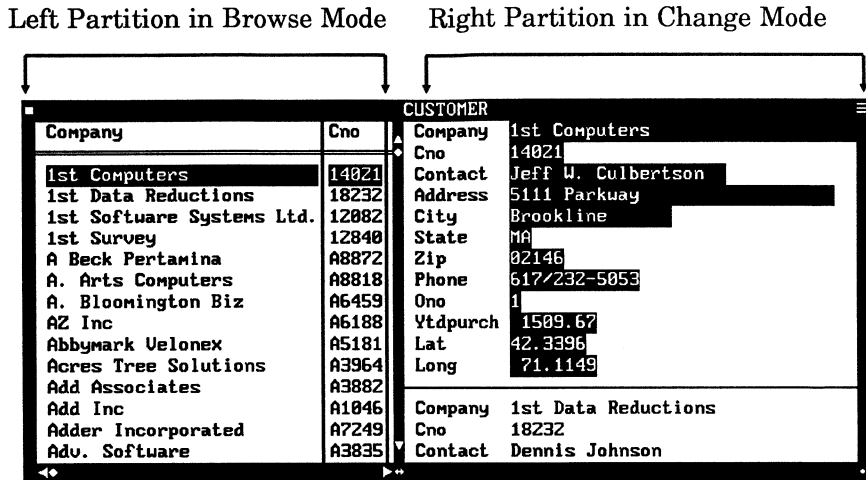


Figure 9: Browse Window with Partitions in Different Modes

Now you'll see how versatile the Browse window is. Unlink the partitions and scroll through the records in one partition, leaving records in the other partition unchanged.

**Unlinking Partitions**

Choose **Unlink Partitions** from the **Browse** menu popup, then scroll through some records.

Remember that everything you have done to this Browse window is for display purposes only. You have not changed the way the information is actually stored.

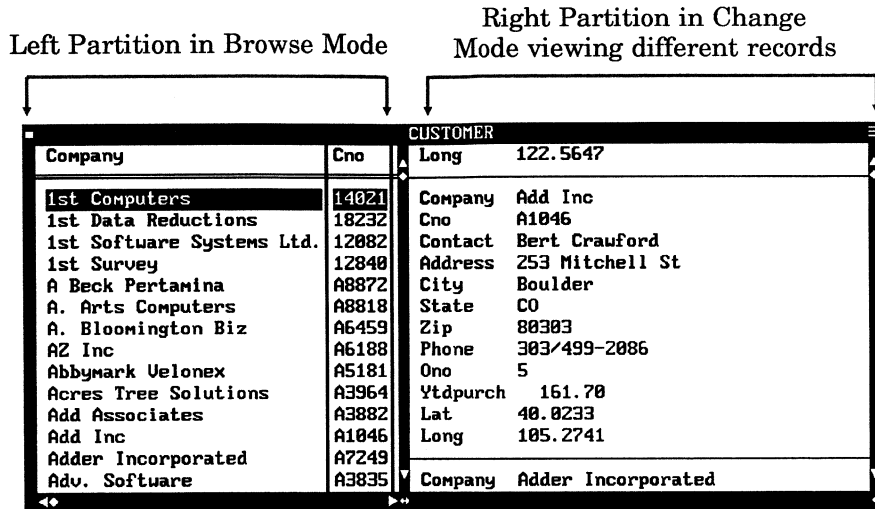


Figure 10: Browse Window with Partitions Unlinked

### Closing the Browse Window

Click on the close box or chose **Close** from the **File** menu popup.

Notice that the Command window is slightly different than when you first opened the Browse window. When you choose options from the interface, FoxPro generates commands in the Command window. Figure 11 shows two commands that FoxPro has generated. You will learn more about the Command window as you proceed.

The CUSTOMER database is only one of the .DBF files provided. Another file included is SALESMAN.DBF. This database contains data about the salesmen at our sample business.

Let's look at SALESMAN.DBF in a Browse window.

### Browsing SALESMAN.DBF

1. Choose **Open...** from the **File** menu popup. Make sure **TUTORIAL** appears on the **Directory** popup.
2. Select SALESMAN.DBF, then choose the **Open** push button.
3. Choose **Browse** from the **Database** menu popup. The Browse window appears as in Figure 12.

The Browse window displays salesman information in a familiar fashion. Each record represents a salesman, with each field containing information about that salesman.

```

Command
USE C:\FOXPRO\TUTORIAL\CUSTOMER.DBF
BROWSE LAST
    
```

Figure 11: Commands Executed For You

SALESMAN						
Sale	Ono	Notes	Name	Ytdsales	Phone	Address
117	1	Memo	Janet A. McCarthy	21427.27	203/569-1163	1417 S Dearborn Ci
150	1	Memo	Robert Watters	24762.85	617/894-4332	1225 Church St.
175	1	Memo	Doris Dupuy	20203.99	617/679-4071	336 N.E. 23rd St
180	1	MEMO	T Staziola Townsend	7798.34	617/273-2904	1012 C Renault Str
240	2	MEMO	John Hodge	102797.63	412/981-7562	621 Industrial Way
271	2	MEMO	Howard Schneider	42181.43	215/432-3022	709 South Broad Av
281	2	MEMO	Jay Kennedy	50521.98	212/246-5348	740 Summer Ave
294	2	MEMO	Tom Caravello	69118.59	201/529-2831	4821 W. Lunt Ave.
322	3	MEMO	E. Faulkner	16004.70	803/776-8662	938 Sherman Way

Figure 12: Browse Window for SALESMAN.DBF

In SALESMAN.DBF, you'll notice a rather unusual NOTES field between the ONO and NAME fields. This field contains the word "Memo" or "memo." A *memo* is a type of field that can hold any amount or type of information. Because this information may be several pages long, it would be difficult to display it in the standard Browse format. Instead, you can open a memo window to view the information contained in this field.

Because a memo window is like other windows, you can move it and resize it to make it easier to see both the memo field information and the Browse window at the same time. Give it a try.

### **Opening, Resizing and Moving a Memo Window**

With the keyboard:

1. Select the word Memo next to Janet A. McCarthy and press Ctrl+PgDn.
2. Resize the memo window, then move it so that it appears below the Browse window on your screen. (Figure 13)
3. Select the Browse window and scroll with the Up and Down Arrow *keys*.

With the mouse:

1. Point to the word Memo next to Janet A. McCarthy and double-click.
2. Resize the memo window, then move it so that it appears below the Browse window on your screen. (Figure 13)
3. Select the Browse window and scroll with the Up and Down Arrow *keys*.

"Why," you may ask, "is there a Memo and a memo?"

The difference in capitalization tells you at a glance whether a particular memo field contains information. A capital "M" says that there is indeed information in this memo field and a lower-case "m" says, "don't bother looking in this here memo field, 'cause it's as empty as a gas tank the day before payday."

As you scrolled through the records with the arrow keys, you probably noticed that the information in the memo window changed to match the current record in the Browse window. You probably also jumped up and said, "That's fantastic!" If you didn't, you should have.



Inactive Browse Window

The screenshot shows a window titled "SALESMAN" with a table of data. Below the table is a "SALESMAN.NOTES" window containing a single line of text. Arrows indicate that the window is inactive, as the text in the notes window is not selected.

Sale	Ono	Notes	Name	Ytdsales	Phone	Address
117	1	Memo	Janet A. McCarthy	21427.27	203/569-1163	1417 S Dearborn Ci
150	1	Memo	Robert Watters	24762.85	617/894-4332	1225 Church St.
175	1	Memo	Doris Dupuy	20203.99	617/679-4071	336 N.E. 23rd St
180	1	Memo	T Staziola Townsend	7798.34	617/273-2904	1012 C Renault Str
240	2	Memo	John Hodge	102797.63	412/981-7562	621 Industrial Way
271	2	Memo	Howard Schneider	42181.43	215/432-3022	709 South Broad Av
281	2	Memo	Jay Kennedy	50521.98	212/246-5348	740 Summer Ave
294	2	Memo	Tom Caravello	69118.59	201/529-2831	4821 W. Lunt Ave.
322	3	Memo	E. Faulkner	16004.70	803/776-8662	938 Sherman Way

SALESMAN.NOTES

Janet has been salesperson of the month for one consecutive month!

Active Memo Window with Controls Showing

Figure 13

Active Browse Window with Controls Showing and Record Selected

The screenshot shows the same "SALESMAN" window as Figure 13, but with the record for Doris Dupuy (Sale 175) selected. The "SALESMAN.NOTES" window now contains a different message. Arrows indicate that the window is active, as the text in the notes window is selected.

Sale	Ono	Notes	Name	Ytdsales	Phone	Address
117	1	Memo	Janet A. McCarthy	21427.27	203/569-1163	1417 S Dearborn Ci
150	1	Memo	Robert Watters	24762.85	617/894-4332	1225 Church St.
175	1	Memo	Doris Dupuy	20203.99	617/679-4071	336 N.E. 23rd St
180	1	Memo	T Staziola Townsend	7798.34	617/273-2904	1012 C Renault Str
240	2	Memo	John Hodge	102797.63	412/981-7562	621 Industrial Way
271	2	Memo	Howard Schneider	42181.43	215/432-3022	709 South Broad Av
281	2	Memo	Jay Kennedy	50521.98	212/246-5348	740 Summer Ave
294	2	Memo	Tom Caravello	69118.59	201/529-2831	4821 W. Lunt Ave.
322	3	Memo	E. Faulkner	16004.70	803/776-8662	938 Sherman Way

SALESMAN.NOTES

Doris is lazy. She needs to be terminated but her father is one of our biggest clients.

Inactive Memo Window

Figure 14

You can see why we said at the start of this session that the Browse window is a very powerful tool for viewing and editing your information.

“Wait,” you say, “you haven’t said a thing about editing my information.”

Let’s talk a minute about editing your information. Whenever you are in a standard Browse window, you can scroll to a particular record and change the content of that record. It’s as simple as that.

You will work with changing information later on. You can also add and delete records while you are in a Browse window, but you will learn about that later, too.

Let’s clean up now and take a short break.

### **Closing the Browse Window and Exiting FoxPro**

With the keyboard:

Press **Escape**, then choose **Quit** from the **File** menu popup.

With the mouse:

Click on the close box of the Browse window, then choose **Quit** from the **File** menu popup.

## Retrieving Your Data

In this session you'll learn to open FoxPro's powerful RQBE window, quickly mastering techniques for gathering specific information from your database file.

- Opening the RQBE window . . . . . page 2
- Browsing a query . . . . . page 4
- Modifying a query . . . . . page 6

## Retrieving Your Data

---

In the last session you learned about viewing data. This is an important subject, but the primary reason to store data on a computer is so you can quickly extract certain pieces of that data.

The process of extracting information is called *querying*. FoxPro has an incredibly powerful, yet stunningly simple, querying facility called RQBE. RQBE stands for Relational Query By Example.

- *Relational* refers to FoxPro's ability to relate the database files needed to perform the query.
- *Query* means to question or inquire.
- *By Example* is the way that you naturally ask questions such as, "Can you tell me how many companies are located in CA?"

RQBE allows you to look at your data this way and that, or the other way if you prefer, with speed and simplicity. If you can imagine it, FoxPro's RQBE can show it to you.

Let's explore FoxPro's RQBE facility.

### Opening the RQBE Window

1. Start FoxPro.
2. Choose **New...** from the **File** menu popup.
3. In the New File dialog, choose the **Query** radio button (Figure 1), then choose **OK**.
4. In the Open File dialog, make sure **TUTORIAL** is showing on the **Directory** popup, select CUSTOMER.DBF (Figure 2), then choose **Open**.

The RQBE window appears as in Figure 3.

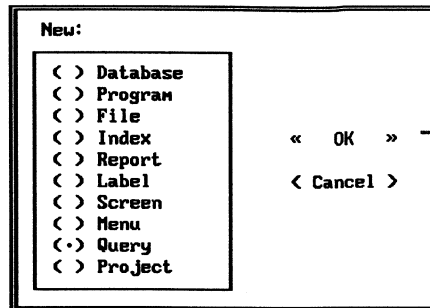


Figure 1: New File Dialog

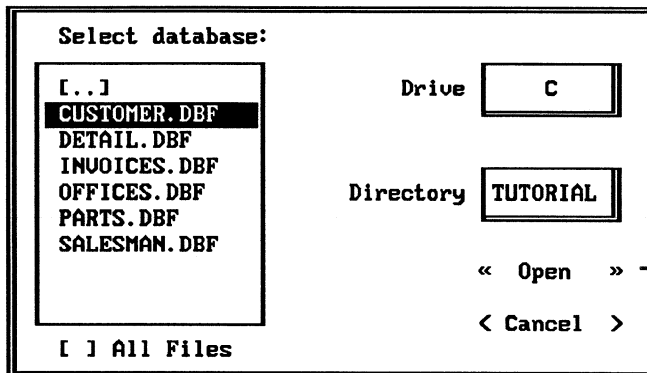


Figure 2: Open File Dialog

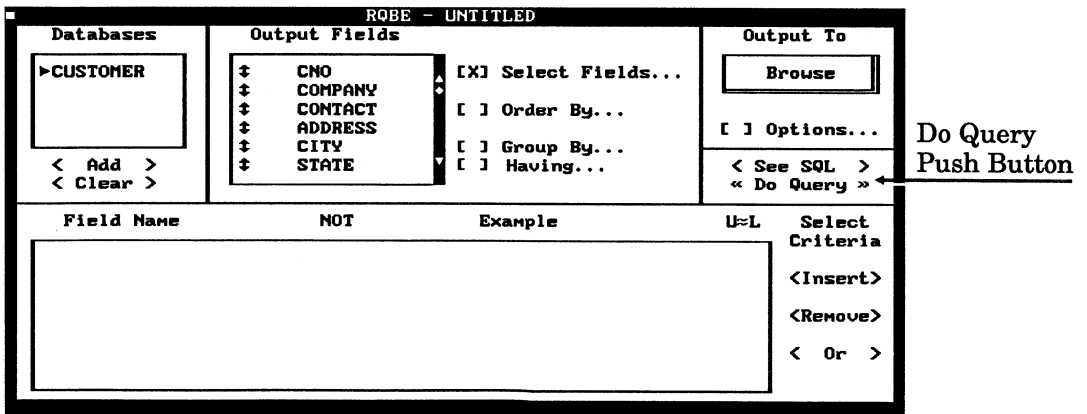


Figure 3: RQBE Window

When you perform a query, FoxPro keeps you posted about its progress, reading records and such. You will see status messages as the query progresses. When the query is complete, FoxPro shows you the number of records selected and the amount of time it took to answer your query. Not long!

You'll output the results of your query to a Browse window. You can manipulate the Browse window just as you did in Session 1.

### Doing a Query

1. Choose the **Do Query** push button in the RQBE window. Figure 4 shows the status message.
2. The Browse window appears as in Figure 5. Scroll through some records in the Browse window.

Note that what you are looking at is just a *copy* of the actual data — you cannot use this Browse window to modify the data in any way. But it does provide you with an excellent way to view the requested data.

The Browse window takes its fields from the **Output Fields** list in the RQBE window. The default for a newly opened database is to display all fields.

QUERY		
Cno	Company	Selected 500 records in 1.54 seconds
14021	1st Computers	Jeff W. Culbert
18232	1st Data Reductions	Dennis Johnson
12082	1st Software Systems Ltd.	Rance Sivren
12840	1st Survey	Robert Hepworth
A8872	A Beck Pertamina	Jim Ansarti
A8818	A. Arts Computers	Darryl Roudebus
A6459	A. Bloomington Biz	Phil Putnam
A6188	AZ Inc	Tom Totah
A5181	Abbymark Uelonex	Isador Sweet
A3964	Acres Tree Solutions	Russell Kmickle
A3882	Add Associates	Len Silverman
A1046	Add Inc	Bert Crauford
A7249	Adder Incorporated	Brenda Carturig
A3835	Adv. Software	Barbara H. Mart

Figure 4: Query Output with Status Message

QUERY		
Cno	Company	Contact
14021	1st Computers	Jeff W. Culbert
18232	1st Data Reductions	Dennis Johnson
12082	1st Software Systems Ltd.	Rance Sivren
12840	1st Survey	Robert Hepworth
A8872	A Beck Pertamina	Jim Ansarti
A8818	A. Arts Computers	Darryl Roudebus
A6459	A. Bloomington Biz	Phil Putnam
A6188	AZ Inc	Tom Totah
A5181	Abbymark Uelonex	Isador Sweet
A3964	Acres Tree Solutions	Russell Kmickle
A3882	Add Associates	Len Silverman
A1046	Add Inc	Bert Crauford
A7249	Adder Incorporated	Brenda Carturig
A3835	Adv. Software	Barbara H. Mart

Figure 5: Query Results in a Browse Window

You can also tell RQBE that you want to include only certain fields.

Let's say that you don't need to see the CNO, ADDRESS, ZIP and ONO fields. You can return to the RQBE window and specify the fields that you *do* want to include in your output.

### Specifying Fields in a Query

1. Close the Browse window.
2. In the RQBE window, choose the **Select Fields...** check box to display the RQBE Select Fields dialog. (Figure 6)
3. Choose the **Remove All** push button to clear the **Selected Output** list.
4. Select the **COMPANY** field in the **Database Fields** list and choose the **Move →** push button.  
  
If you have a mouse, try double-clicking on the **COMPANY** field. It has the same effect as selecting the field and choosing **Move →**.
5. Repeat step four for the following fields: **CONTACT**, **PHONE**, **CITY**, **STATE** and **YTDPURCH**.
6. When the RQBE Select Fields dialog appears as in Figure 7, choose **OK**. The selected fields appear in the **Output Fields** list in the RQBE window.

You may have wondered why we told you to select the fields in the order we did. The order that you select the fields will be the order that they'll appear in the Browse window after you do the query.



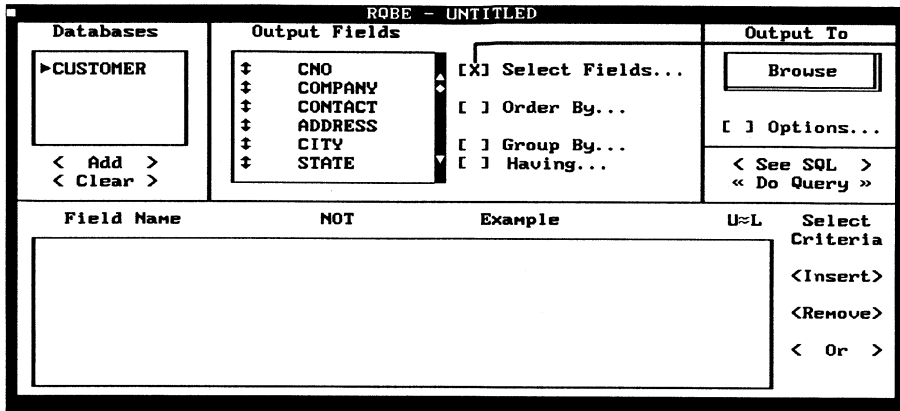


Figure 6: RQBE Window

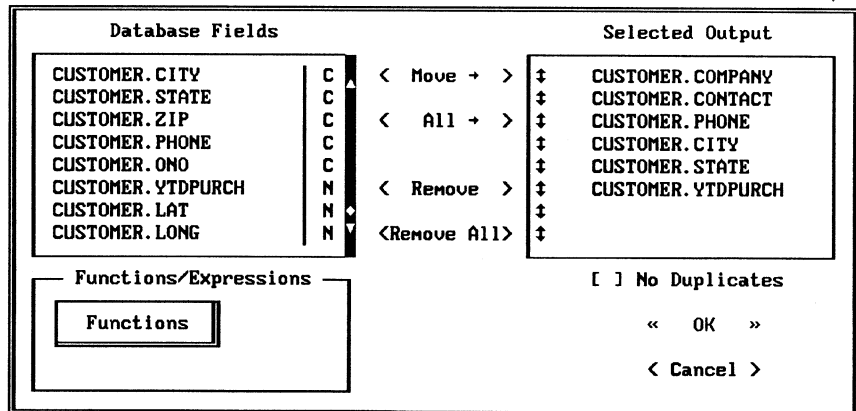


Figure 7: RQBE Select Fields Dialog

**Doing the Query**

Choose the **Do Query** push button in the RQBE window.  
The Browse window appears as in Figure 8.

The Browse window now includes only those fields that you selected.

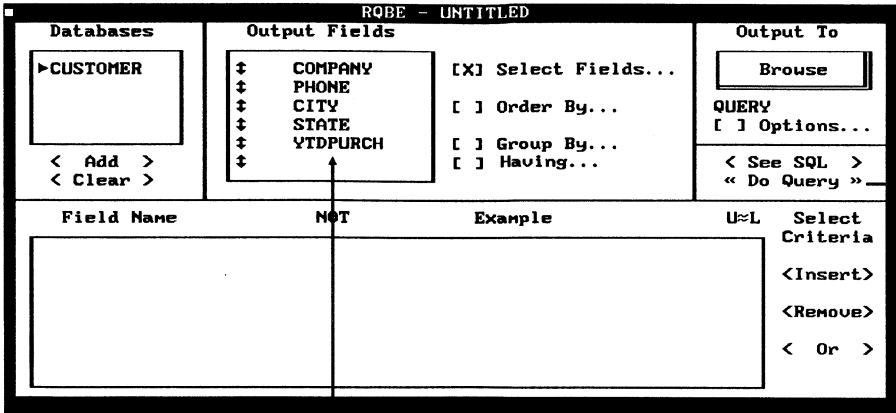
QUERY			
Company	Contact	Phone	City
1st Computers	Jeff W. Culbertson	617/232-5053	Brookline
1st Data Reductions	Dennis Johnson	504/524-3966	New Orleans
1st Software Systems Ltd.	Rance Sivren	713/723-1288	Houston
1st Survey	Robert Hepworth	214/243-7247	Dallas
A Beck Pertamina	Jim Ansarti	617/643-6920	Arlington
A. Arts Computers	Darryl Roudebush	617/662-0157	Melrose
A. Bloomington Biz	Phil Putnam	904/222-9457	Tallahase
AZ Inc	Tom Totah	617/823-5180	Taunton
Abbymark Velonex	Isador Sweet	214/922-4927	Dallas
Acres Tree Solutions	Russell Kwickle	201/786-0785	Sparta
Add Associates	Len Silverman	415/897-2810	Novato
Add Inc	Bert Crawford	303/499-2086	Boulder
Adder Incorporated	Brenda Cartwright	313/573-5873	Warren
Adv. Software	Barbara H. Martin	617/646-7974	Arlington

Figure 8: Browse Window Showing Specific Fields

After studying the Browse, you may decide that you do not need to see the CONTACT field. Try removing CONTACT and see how the query output looks.

### Removing Fields from a Query

1. Close the Browse window.
2. Choose the **Select Fields...** check box.
3. Select the CONTACT field in the **Selected Output** list, then choose **Remove**.
4. Choose **OK**. Notice that CONTACT no longer appears in the **Output Fields** list. (Figure 9)
5. Choose **Do Query**. The Browse window appears as in Figure 10.
6. Size the Browse window then scroll through some records.



Output Fields List

Figure 9: RQBE Window

QUERY				
Company	Phone	City	State	Ytdpurch
1st Computers	617/232-5053	Brookline	MA	1509.67
1st Data Reductions	504/524-3966	New Orleans	LA	1608.35
1st Software Systems Ltd.	713/723-1288	Houston	TX	2272.06
1st Survey	214/243-7247	Dallas	TX	754.81
A Beck Pertamina	617/643-6920	Arlington	MA	3991.66
A. Arts Computers	617/662-0157	Melrose	MA	3922.04
A. Bloomington Biz	904/222-9457	Talahase	FL	684.47
AZ Inc	617/823-5180	Taunton	MA	370.73
Abbymark Uelonex	214/922-4927	Dallas	TX	1390.17
Acres Tree Solutions	201/786-0785	Sparta	NJ	272.48
Add Associates	415/897-2810	Novato	CA	5487.46
Add Inc	303/499-2086	Boulder	CO	161.70
Adder Incorporated	313/573-5873	Warren	MI	722.25
Adv. Software	617/646-7974	Arlington	MA	4820.51

Figure 10: Query Results without CONTACT Field

Now that you have selected the fields, you can specify the order you want the data presented. For instance, try displaying your data alphabetically by city.

### Ordering Fields in a Query

1. Close the Browse window.
2. Choose the **Order By...** check box in the RQBE window. (Figure 11)
3. In the RQBE Order By dialog, select CUSTOMER.CITY then choose **Move** →. (Figure 12)
4. Choose **OK**. Notice that a 1 and ↑ appear next to CITY in the **Output Fields** list. The 1 indicates that CITY is the first priority when ordering the data and the ↑ indicates that the data will be displayed in ascending order.
5. Choose **Do Query**. The Browse window appears. (Figure 13)
6. Scroll through some records in the Browse window.

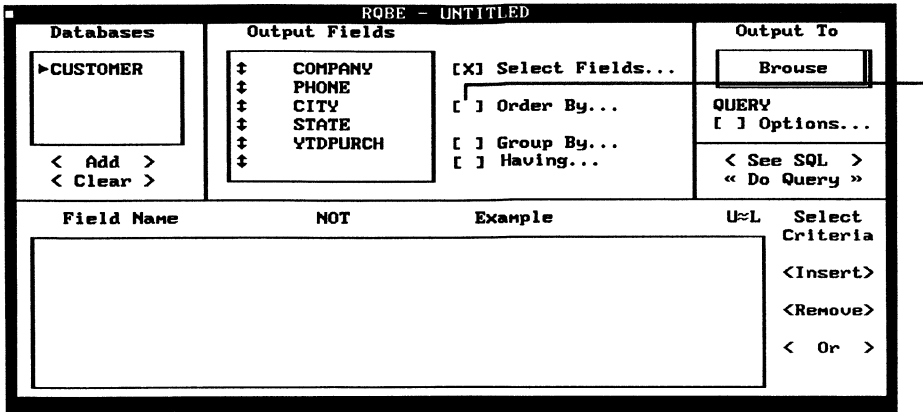


Figure 11: RQBE Window

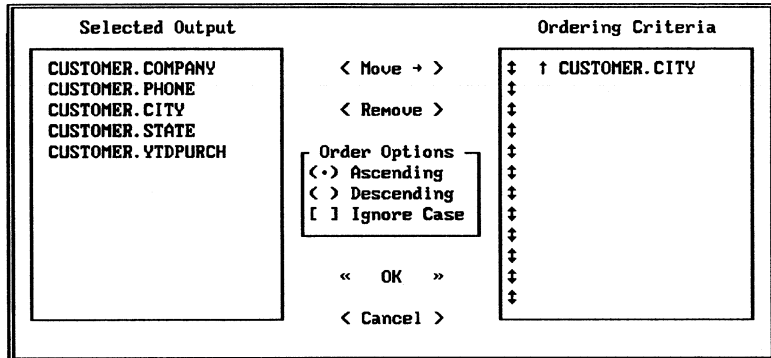


Figure 12: RQBE Order By Dialog

QUERY				
Company	Phone	City	State	Vtdpurch
Thinfilm Computer Inc	818/889-2717	Agoura	CA	6892.47
The Circle Distributing Shop	518/869-8738	Albany	NY	1858.88
Herring Inc.	505/842-9770	Albuquerque	NM	5019.53
Business State Computers	215/481-8653	Allentown	PA	595.46
Crescent Computer Source	806/372-7291	Amarillo	TX	3764.21
Posna Associates	617/475-9321	Andover	MA	2361.61
Data White Truck Steel	313/668-2612	Ann Arbor	MI	8876.77
Baptist Im-pak	313/769-3038	Ann Arbor	MI	3276.16
Soltis & Inc.	313/769-9760	Ann Arbor	MI	848.80
Sweet County	415/439-3581	Antioch	CA	1757.96
Min/Max Resource Systems	414/733-1643	Appleton	WI	1007.20
Control Communication & Compu	818/796-5398	Arcadia	CA	6176.09
A Beck Pertamina	617/643-6920	Arlington	MA	3991.66
Adv. Software	617/646-7974	Arlington	MA	4820.51

Figure 13: Query Results in Order by CITY

You can order your data any way you want. For instance, suppose you want your data ordered by state, and by city within each state. Now change the order of the information to match.

### Ordering by Multiple Fields in a Query

1. Close the Browse window.
2. Choose the **Order By...** check box.
3. In the RQBE Order By dialog, select CUSTOMER.STATE then choose **Move** →.
4. Adjust the order of the fields in the **Ordering Criteria** list.
  - With the keyboard, Tab to the **Ordering Criteria** list and use the Down Arrow key to select STATE then press Ctrl+PageUp so that STATE appears above CITY in the list.
  - With the mouse, point to the double-headed arrow preceding STATE in the **Ordering Criteria** list and drag it until STATE appears above CITY in the list.
5. When the Order By dialog appears as in Figure 14, choose **OK**.

Observe how the **Output Fields** list reflects your changes. The 1 preceding STATE indicates the data is ordered first by STATE. The 2 in front of CITY indicates that the data is ordered second by city within each state. The arrows indicate that the data will be displayed in ascending order.

### Doing the Query

Choose the **Do Query** push button in the RQBE window. Figure 15 displays the results of the query.

The data in the Browse window is ordered just as you desired.



Selected Output		Ordering Criteria
CUSTOMER.COMPANY	< Move → >	↓ ↑ CUSTOMER.STATE
CUSTOMER.PHONE	< Remove >	↓ ↑ CUSTOMER.CITY
CUSTOMER.CITY		↓
CUSTOMER.STATE		↓
CUSTOMER.YTDPURCH		↓
	Order Options	↓
	(.) Ascending	↓
	< > Descending	↓
	[ ] Ignore Case	↓
	« OK »	↓
	< Cancel >	↓

Figure 14: RQBE Order By Dialog

QUERY				
Company	Phone	City	State	Ytdpurch
Vergen Endeavors	907/543-3784	Bethel	AK	14820.12
Steven Computers	205/881-2245	Huntsville	AL	2244.58
Walker Business Gallery	205/749-9081	Opelika	AL	10297.90
Harpoon Store	501/663-9706	Little Rock	AR	1688.07
Great Form	602/892-8572	Mesa	AZ	2523.50
Goods For The Masses	602/276-5827	Phoenix	AZ	2684.18
Harpoon PCA	602/943-5082	Phoenix	AZ	17777.06
Pro and Power	602/276-6239	Phoenix	AZ	348.34
Raybank Services & Computin	602/943-4609	Phoenix	AZ	655.91
Quik Assistance	602/953-8069	Scottsdale	AZ	5331.48
SC Co.	602/991-1550	Scottsdale	AZ	543.28
Thralls Senski	602/894-9367	TEMPE	AZ	1419.20
Weichert Compuserve	604/381-2591	Victoria	BC	2200.21
Thinfilm Computer Inc	818/889-2717	Agoura	CA	6892.47

Figure 15: Query Results in Order by STATE and CITY

Until now, you have been looking at all of the records in the CUSTOMER database.

Now you can start asking questions — of your database, that is.

Suppose you ask, “What companies are located in Ohio?” Using the RQBE window, this question is answered almost immediately.

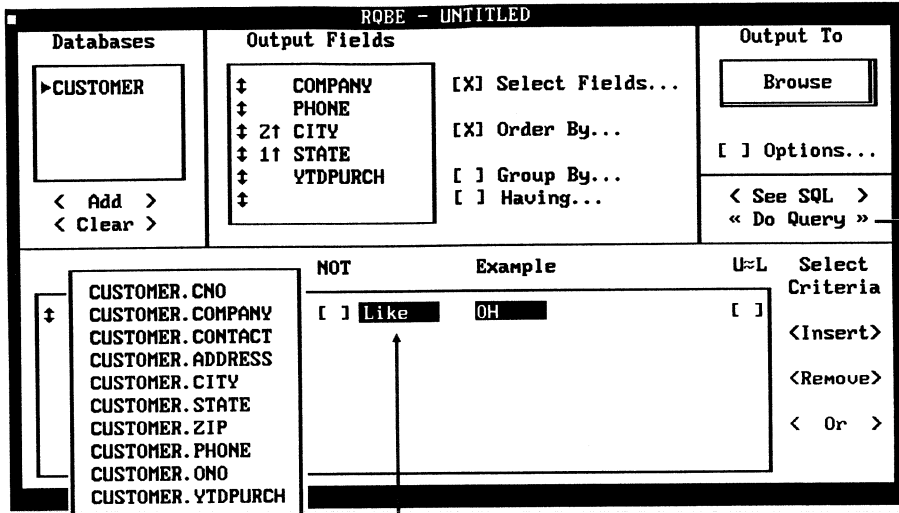
### Specifying Selection Conditions

1. Close the Browse window.
2. Choose CUSTOMER.STATE from the **Field Name** popup located in the bottom portion of the RQBE window. (Figure 16)

**Like** appears by default on the comparison popup control. (Figure 16)

3. Type OH in the text box below **Example**. (Figure 16)  
Be sure both letters are capitalized.
4. Choose **Do Query**. The Browse window appears. (Figure 17)
5. Scroll through some records in the Browse window.

The Browse window now displays the data for only those companies located in Ohio. **Like** specifies that CUSTOMER.STATE must match OH to be included in the output.



Field Name  
Popup

Comparison  
Popup Control

Figure 16: RQBE Window

QUERY				
Company	Phone	City	State	Ytdpurch
System County Medical Health Legal Corp.	216/285-1201	Chardon	OH	5579.33
Micro Time Corp	513/731-8895	Cincinnati	OH	3743.70
Polytron Business Machines	513/381-5929	Cincinnati	OH	456.86
Sacred City Steel Inc.	513/231-4793	Cincinnati	OH	707.70
Steven Software Solutions	216/292-4892	Cleveland	OH	1355.19
System Business Machines Ltd	614/445-1107	Columbus	OH	3638.58
Wright L. Tither & Sons.	614/224-7820	Columbus	OH	6614.78
Financial Stamps Of Builders	614/895-8647	Columbus	OH	729.53
Raymond Computing	513/434-5036	Dayton	OH	1915.58
Patrick Inc	513/229-2046	Dayton	OH	8996.02
Maximal Computing Prosthesis	216/851-3379	E Cleveland	OH	148.41
DPCS Produce	614/261-4356	Hilliard	OH	1656.95
Town Computer Systems	606/329-6350	Ironton	OH	136.77
	513/677-7780	Mainville	OH	5779.89

Figure 17: Browse Window with Companies in Ohio

Use the same simple procedure to display those companies located in both Ohio and Michigan.

### Specifying More Selection Conditions

1. Close the Browse window.
2. Select **In** from the comparison popup (between the **Field Name** popup and the text box below **Example**.) (Figure 18)
3. In the text box below **Example**, after OH type , MI. (Figure 18)
4. Choose **Do Query**. The Browse window appears as in Figure 19.

FoxPro displays only companies located in Ohio or Michigan because **In** specifies that, to be included in the output, CUSTOMER.STATE must be one of the items in the **Example** text box.

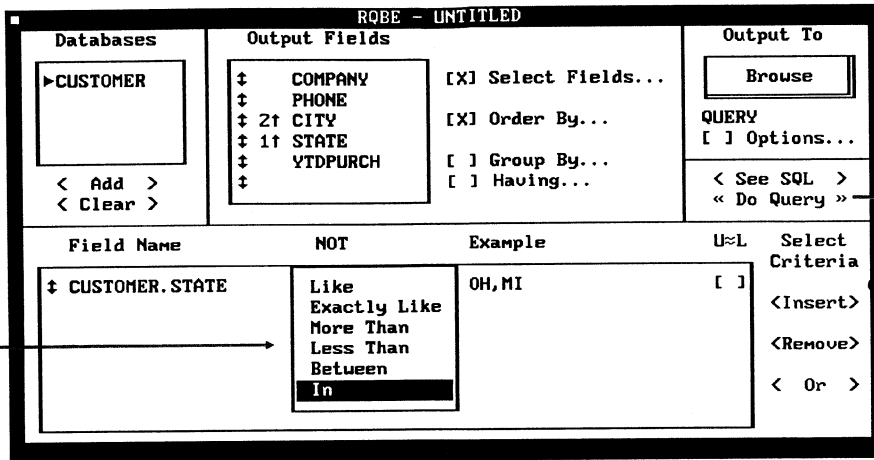


Figure 18: RQBE Window

Comparison Popup

The screenshot shows the QUERY window with a table of company data. The table has five columns: Company, Phone, City, State, and Ytdpurch. The data is as follows:

Company	Phone	City	State	Ytdpurch
Data White Truck Steel	313/668-2612	Ann Arbor	MI	8876.77
Baptist Im-pak	313/769-3038	Ann Arbor	MI	3276.16
Soltis & Inc.	313/769-9760	Ann Arbor	MI	848.80
Henneke House World	517/351-6079	East Lansing	MI	1921.83
Legal Inc	313/624-3487	Farmington Hill	MI	9521.57
Calif Beauty Inc.	616/241-3767	Grand Rapids	MI	2304.08
Johnson Specialties	517/784-5590	Jackson	MI	350.34
Computer Logic Hurdman	517/393-9037	Lansing	MI	3132.42
California Alarm	313/356-5421	Southfield	MI	1982.12
Adder Incorporated	313/573-5873	Warren	MI	722.25
System County Medical Health	216/285-1201	Chardon	OH	5579.33
Legal Corp.	513/731-8895	Cincinnati	OH	3743.70
Micro Time Corp	513/381-5929	Cincinnati	OH	456.86
Polytron Business Machines	513/231-4793	Cincinnati	OH	707.70

Figure 19: Browse Window with Companies in Michigan and Ohio

Perhaps it would be better to see the data ordered by company name within each state, instead of by city. Give it a try.

### **Specifying and Ordering Selection Conditions**

1. Close the Browse window.
2. Choose the **Order By...** check box.
3. Select CUSTOMER.CITY then choose **Remove**.
4. Select CUSTOMER.COMPANY then choose **Move** →.
5. Choose **OK**. The RQBE window appears as in Figure 20.
6. Choose **Do Query**. The Browse window appears as in Figure 21.

The companies are now ordered alphabetically by company name within each state. Because you haven't changed the selection criteria, only companies located in Ohio or Michigan are displayed.

RQBE - UNTITLED

Databases	Output Fields	Output To
▶CUSTOMER  < Add > < Clear >	‡ Z↑ COMPANY    [X] Select Fields... ‡    PHONE        [X] Order By... ‡    CITY           [ ] Group By... ‡ 1↑ STATE        [ ] Having... ‡    YTDPURCH	Browse  QUERY [ ] Options...  < See SQL > « Do Query »
Field Name	NOT	Example
‡ CUSTOMER.STATE	[ ] In	OH, MI
		U=L    Select Criteria
		< Insert >
		< Remove >
		< Or >

Figure 20: RQBE Window

QUERY

Company	Phone	City	State	Ytdpurch
Adder Incorporated	313/573-5873	Warren	MI	722.25
Baptist Im-pak	313/769-3038	Ann Arbor	MI	3276.16
Calif Beauty Inc.	616/241-3767	Grand Rapids	MI	2304.08
California Alarm	313/356-5421	Southfield	MI	1982.12
Computer Logic Hurdman	517/393-9037	Lansing	MI	3132.42
Data White Truck Steel	313/668-2612	Ann Arbor	MI	8876.77
Hennekee House World	517/351-6079	East Lansing	MI	1921.83
Johnson Specialties	517/784-5590	Jackson	MI	350.34
Legal Inc	313/624-3487	Farmington Hill	MI	9521.57
Soltis & Inc.	313/769-9760	Ann Arbor	MI	848.80
DPCS Produce	606/329-6350	Ironton	OH	136.77
Financial Stamps Of Builders	513/434-5036	Dayton	OH	1915.58
Legal Corp.	513/731-8895	Cincinnati	OH	3743.70
Maximal Computing Prosthesis	614/261-4356	Hilliard	OH	1656.95

Figure 21: Browse Window with Companies Ordered Alphabetically by State

RQBE allows you to specify multiple selection conditions.

Suppose you want to look at only those companies in Ohio or Michigan whose year-to-date purchases are more than \$1,000.00.

By now you realize how easy it is to specify this using the RQBE window.

### Specifying Even More Selection Conditions

1. Close the Browse window.
2. Place the cursor below CUSTOMER.STATE and choose CUSTOMER.YTDPURCH from the **Field Name** popup.
3. Choose **More Than** from the comparison popup.
4. In the text box below **Example**, type 1000.
5. When the RQBE window appears as in Figure 22, choose **Do Query**. The Browse window appears. (Figure 23)

As expected, all of the records displayed match the conditions that you specified.

With RQBE, just a few keystrokes allow you to retrieve and combine information from your database.



RQBE - UNTITLED

Databases	Output Fields	Output To															
▶CUSTOMER  < Add > < Clear >	↓ COMPANY [X] Select Fields... ↓ PHONE ↓ Z↑ CITY [X] Order By... ↓ 1↑ STATE [ ] Group By... ↓ YTDPURCH [ ] Having...	Browse  [ ] Options...  < See SQL > « Do Query »															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Field Name</th> <th style="width: 15%;">NOT</th> <th style="width: 20%;">Example</th> <th style="width: 10%;">U=L</th> <th style="width: 25%;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>↓ CUSTOMER.STATE</td> <td>[ ] In</td> <td>OH, MI</td> <td>[ ]</td> <td>&lt;Insert&gt;</td> </tr> <tr> <td>↓ CUSTOMER.YTDPURCH</td> <td>[ ] More Than</td> <td>1000</td> <td>[ ]</td> <td>&lt;Remove&gt;</td> </tr> </tbody> </table>			Field Name	NOT	Example	U=L	Select Criteria	↓ CUSTOMER.STATE	[ ] In	OH, MI	[ ]	<Insert>	↓ CUSTOMER.YTDPURCH	[ ] More Than	1000	[ ]	<Remove>
Field Name	NOT	Example	U=L	Select Criteria													
↓ CUSTOMER.STATE	[ ] In	OH, MI	[ ]	<Insert>													
↓ CUSTOMER.YTDPURCH	[ ] More Than	1000	[ ]	<Remove>													
< Or >																	

Figure 22: RQBE Window

QUERY

Company	Phone	City	State	Ytdpurch
Baptist Im-pak	313/769-3038	Ann Arbor	MI	3276.16
Calif Beauty Inc.	616/241-3767	Grand Rapids	MI	2304.08
California Alarm	313/356-5421	Southfield	MI	1982.12
Computer Logic Hurdman	517/393-9037	Lansing	MI	3132.42
Data White Truck Steel	313/668-2612	Ann Arbor	MI	8876.77
Hennekee House World	517/351-6079	East Lansing	MI	1921.83
Legal Inc	313/624-3487	Farmington Hill	MI	9521.57
Financial Stamps Of Builders	513/434-5036	Dayton	OH	1915.58
Legal Corp.	513/731-8895	Cincinnati	OH	3743.70
Maximal Computing Prosthesis	614/261-4356	Hilliard	OH	1656.95
PC Bogg Center	419/629-6499	New Bremen	OH	5419.24
Raymond Computing	513/229-2046	Dayton	OH	8996.02
Sacred City Steel Inc.	216/292-4892	Cleveland	OH	1355.19
Steven Software Solutions	614/445-1107	Columbus	OH	3638.58

Figure 23: Companies in Michigan or Ohio with Year-to-Date Purchases &gt; \$1000

Consider this scenario. You spoke to a man on a plane about an order and you entered his information into your CUSTOMER database file. Nine months later he calls and says, “I talked to you on the plane from Denver and if you can tell me my name, I will give you a one million dollar order.”

“Oh my gosh!” you think. But you don’t remember anything about him except that his company’s name begins with “Tr”. Aren’t you glad that you have RQBE?

### Gathering Specific Information With RQBE

1. Close the Browse window.
2. Check the **Select Fields...** check box then select CUSTOMER.CONTACT and choose **Move** →. Rearrange the fields so that CONTACT is below COMPANY in the **Selected Output** list. Choose **OK**.
3. Select CUSTOMER.YTDPURCH from the **Field Name** popup then choose the **Remove** push button under Select Criteria.
4. Change CUSTOMER.STATE to CUSTOMER.COMPANY on the **Field Name** popup control.
5. Select **Like** from the comparison popup.
6. Type Tr in the **Example** text box.
7. When the RQBE window appears as in Figure 24, choose **Do Query**. The Browse window appears as in Figure 25.

Query output lists only companies beginning with “Tr” so you can scroll until you find the right name.

“Mr. Kieckheser, how could I forget you. How are things at Triad Resort Computers?”

This is when you write Fox Software with your “unsolicited” testimonial.

RQBE - SESSION2

Databases	Output Fields	Output To										
▶CUSTOMER < Add > < Clear >	<table style="width: 100%;"> <tr> <td style="width: 50%;">               ‡ Z↑ COMPANY                ‡ CONTACT                ‡ PHONE                ‡ CITY                ‡ 1↑ STATE                ‡ YTDPURCH             </td> <td style="width: 50%;">               [X] Select Fields...                [X] Order By...                [ ] Group By...                [ ] Having...             </td> </tr> </table>	‡ Z↑ COMPANY ‡ CONTACT ‡ PHONE ‡ CITY ‡ 1↑ STATE ‡ YTDPURCH	[X] Select Fields... [X] Order By... [ ] Group By... [ ] Having...	Browse QUERY [ ] Options... < See SQL > « Do Query »								
‡ Z↑ COMPANY ‡ CONTACT ‡ PHONE ‡ CITY ‡ 1↑ STATE ‡ YTDPURCH	[X] Select Fields... [X] Order By... [ ] Group By... [ ] Having...											
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Field Name</th> <th style="width: 10%;">NOT</th> <th style="width: 20%;">Example</th> <th style="width: 10%;">U=L</th> <th style="width: 30%;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>‡ CUSTOMER.COMPANY</td> <td>[ ] Like</td> <td>Tr</td> <td>[ ]</td> <td>&lt;Insert&gt; &lt;Remove&gt; &lt; Or &gt;</td> </tr> </tbody> </table>		Field Name	NOT	Example	U=L	Select Criteria	‡ CUSTOMER.COMPANY	[ ] Like	Tr	[ ]	<Insert> <Remove> < Or >	
Field Name	NOT	Example	U=L	Select Criteria								
‡ CUSTOMER.COMPANY	[ ] Like	Tr	[ ]	<Insert> <Remove> < Or >								

Figure 24: RQBE Window

QUERY			
Company	Contact	Phone	City
Tri-Chem Systems	Charlie Dobos	415/941-2488	Los Alt
True Computer	Bill Olsen	415/943-0436	Walnut
Triad Systems	Marion Albright	309/734-6280	Monmout
Tri-3 Latent Software	Jeff Lund	212/689-2370	New Yor
True DSSD	Bill Griffin	516/231-5288	Hauppau
Tri-8 Data Data-Corp	Paul Hedgepath	215/868-7225	Bethleh
Triad Resort Computers	Frank Kieckheser	215/328-8070	Springf

Figure 25: Query Results

When you close the RQBE window, FoxPro asks if you want to save your changes. This allows you to use a specific RQBE window many times without re-entering all of the same information. Go ahead and save this RQBE window — you will use it again.

### Closing the RQBE Window

1. Close the Browse window.
2. Close the RQBE window then choose **Yes** from the Save Changes alert. The Save As dialog appears.
3. Make sure **TUTORIAL** appears on the **Directory** popup control, type `Session2` in the text box as shown in Figure 27 then choose **Save**.

You have worked hard and deserve another break. But try not to take as long as last time.

In this session you set out to learn that Queries are Easily Done. As they say in Latin, Q.E.D.

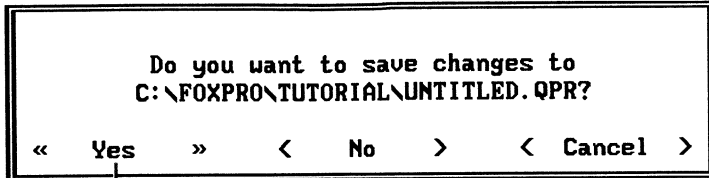


Figure 26: Save Changes Alert

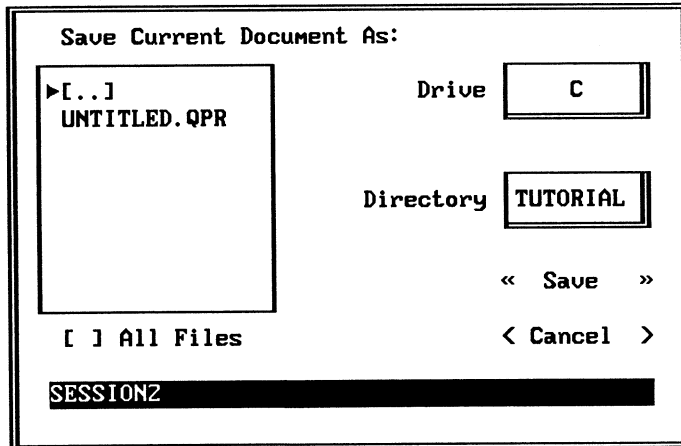


Figure 27: Save As Dialog



# Session 3

## Reporting on Your Data

In this session you 'll learn how to use FoxPro's RQBE to quickly design and generate professional reports from your data.

- Opening an existing query . . . . . page 2
- Generating a report . . . . . page 6
- Modifying a report . . . . . page 10

## Reporting on Your Data

---

In the last session you used RQBE to display information in a Browse window. Another way to present information is in a printed report.

You can use the RQBE facility to create reports for every situation. You can then customize the report using FoxPro's powerful Report Writer.

The first report you'll create is a phone list of all of the customers located in California. You'll begin with the query that you created in Session 2.

### Opening an Existing Query

1. Close the Command window.
2. Choose **Open...** from the **File** menu popup and make sure **Query** is showing on the **Type** popup control in the Open File dialog. (Figure 1)
3. Select SESSION2.QPR, then choose **Open**.

You'll include the following fields in your phone list: COMPANY, PHONE, CONTACT, CITY and STATE. The information should be presented in alphabetical order by company.

### Generating a Report with RQBE

1. Choose the **Select Fields...** check box.
2. Select CUSTOMER.YTDPURCH from the **Selected Output** list and choose **Remove**.
3. Rearrange the order of your fields in the **Selected Output** list so that CONTACT is below PHONE and choose **OK**.
4. Change CUSTOMER.COMPANY to CUSTOMER.STATE on the **Field Name** popup.
5. Type CA in the text box below **Example**.
6. Choose **Report/Label** on the **Output To** popup.
7. When the RQBE window appears as in Figure 2, choose **Do Query**.



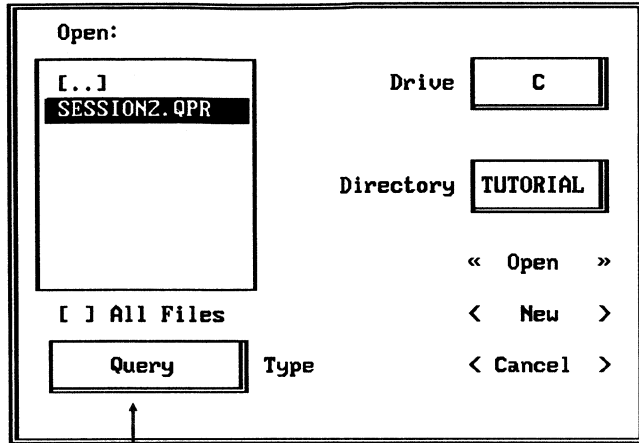


Figure 1: Open File Dialog

Type Popup Control

Output To Popup Control

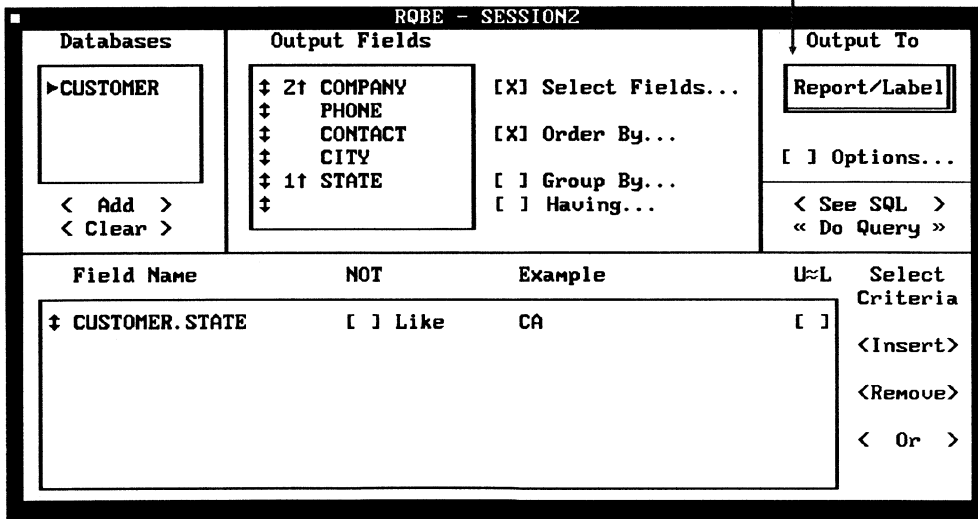


Figure 2: RQBE Window

Take a look at the report that is generated from these settings as shown in Figure 3.

This initial report includes all of the correct information, but a clearer layout will enhance its effectiveness.

**Viewing the Report and Returning to RQBE**

To scroll through the entire report:

- Continue to press any key until you return to the RQBE window.

To return immediately to the RQBE window:

- Press Escape.

System	File	Edit	Database	Record	Program	Window
Add Associates				415/897		
CA						Press any key to continue ...
Advantage Computer School				408/946		se
CA						
American Forum				805/682-5580	Gui Dupuy	Santa Bar
bara	CA					
Atec Data Service				408/246-5353	Randy Keji	Santa Cla
ra	CA					
Automated Mayo Miley				714/540-6062	Bill Hopkins	Orange
CA						
Azimuth Bavis & Systems				415/989-1603	Chuck Heltmeier	San Franc
isco	CA					
Azimuth Corp				619/271-8518	Al Reetz	San Diego
CA						
Battery Weaver				415/952-7761	Brian Case	S. San Fra
ncisco	CA					
Belmar Fishing Systems				415/323-2469	Mike Ozer	Menlo Par
k	CA					
Belmar Tronixs Computer Compuserve				213/452-9369	Andy Rigney	Santa Mon
ica	CA					
Big Incorporated				818/762-5886	Bert Dalgleish	N. Hollyw
ood	CA					
Blake Inc.				415/992-0710	Bob Dot	Daly City
CA						

Figure 3: Initial Report Displayed on Screen

You can create a custom layout by making a few selections in the RQBE Display Options dialog.

This is done by telling FoxPro what report form to use to display the data. RQBE can also automatically create a report form for you based on the information that you specify in the RQBE window.

For example, your Session 3 report will include the fields you select, in the order you specify.

### Generating a Report with RQBE

1. Choose the **Options...** check box in the RQBE window. (Figure 4)
2. Choose the **Report** radio button in the RQBE Display Options dialog and check the **Quick Report...** check box. (Figure 5)
3. In the RQBE Quick Report dialog, type `SESSION3` in the Save as text box (Figure 6) then choose **OK**.
4. Notice that the **Preview Report/Label** check box is automatically checked. Choose **OK** in the RQBE Display Options dialog.

RQBE - SESSION2

<p>Databases</p> <p>▶CUSTOMER</p> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p>Output Fields</p> <table style="width: 100%;"> <tr> <td>‡ Z‡ COMPANY</td> <td><input type="checkbox"/> Select Fields...</td> </tr> <tr> <td>‡ PHONE</td> <td></td> </tr> <tr> <td>‡ CONTACT</td> <td><input type="checkbox"/> Order By...</td> </tr> <tr> <td>‡ CITY</td> <td></td> </tr> <tr> <td>‡ 1‡ STATE</td> <td><input type="checkbox"/> Group By...</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Having...</td> </tr> </table>	‡ Z‡ COMPANY	<input type="checkbox"/> Select Fields...	‡ PHONE		‡ CONTACT	<input type="checkbox"/> Order By...	‡ CITY		‡ 1‡ STATE	<input type="checkbox"/> Group By...		<input type="checkbox"/> Having...	<p>Output To</p> <p>Report/Label</p> <p><input type="checkbox"/> Options...</p> <p>&lt; See SQL &gt; « Do Query »</p>
‡ Z‡ COMPANY	<input type="checkbox"/> Select Fields...													
‡ PHONE														
‡ CONTACT	<input type="checkbox"/> Order By...													
‡ CITY														
‡ 1‡ STATE	<input type="checkbox"/> Group By...													
	<input type="checkbox"/> Having...													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Field Name</th> <th style="text-align: left;">NOT</th> <th style="text-align: left;">Example</th> <th style="text-align: left;">U=L</th> <th style="text-align: left;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>‡ CUSTOMER.STATE</td> <td><input type="checkbox"/> Like</td> <td>CA</td> <td><input type="checkbox"/></td> <td></td> </tr> </tbody> </table>			Field Name	NOT	Example	U=L	Select Criteria	‡ CUSTOMER.STATE	<input type="checkbox"/> Like	CA	<input type="checkbox"/>		<p>&lt; Insert &gt; &lt; Remove &gt; &lt; Or &gt;</p>	
Field Name	NOT	Example	U=L	Select Criteria										
‡ CUSTOMER.STATE	<input type="checkbox"/> Like	CA	<input type="checkbox"/>											

Figure 4: RQBE Window

RQBE Display Options:

<p>Formatting Options</p> <p>&lt; &gt; Screen Display &lt; &gt; Report &lt; &gt; Label</p> <p><input checked="" type="checkbox"/> Report/Label Form Name SESSION3</p> <p><input type="checkbox"/> Quick Report... <input type="checkbox"/> Overwrite</p> <p><input checked="" type="checkbox"/> Preview Report/Label</p> <p><input type="checkbox"/> Show Summary Info Only</p> <p><input type="checkbox"/> Eject Page Before Report</p> <p><input type="checkbox"/> Report Heading</p> <p><input type="checkbox"/> Suppress Column Headings</p> <p>&lt; &gt; Console On ( ) Console Off</p> <p><input checked="" type="checkbox"/> Pause Between Screens</p>	<p>Output Destinations</p> <p><input type="checkbox"/> To Printer <input type="checkbox"/> To File <input type="checkbox"/> Overwrite File</p> <p style="text-align: center;">« OK » &lt; Cancel &gt;</p>
---	---

Figure 5: RQBE Display Options Dialog

RQBE Quick Report:

<p>&lt; &gt; Column Layout &lt; &gt; Form Layout</p> <p>Report Width 80</p> <p>Save as SESSION3</p> <p style="text-align: center;">« OK » &lt; Clear &gt;</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Field1</td> <td style="padding: 2px;">Field2</td> </tr> <tr> <td style="padding: 2px;">xxxxxx</td> <td style="padding: 2px;">xxxxxx</td> </tr> <tr> <td style="padding: 2px;">xxxxxx</td> <td style="padding: 2px;">xxxxxx</td> </tr> <tr> <td style="padding: 2px;">xxxxxx</td> <td style="padding: 2px;">xxxxxx</td> </tr> </table>	Field1	Field2	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Field1	Field2								
xxxxxx	xxxxxx								
xxxxxx	xxxxxx								
xxxxxx	xxxxxx								

Figure 6: Quick Report Dialog

**Doing the Query**

Choose **Do Query**.

Remember the **Preview Report/Label** check box that was automatically checked? This is why the output appears in a Page Preview window, with columns and headings, rather than on the screen. See Figure 7.

Company	Phone	Contact	City
Add Associates	415/897-2810	Len Silverman	Novato
Advantage Computer School	408/946-1317	Duane Marshall	San Jose
American Forum	805/682-5580	Gui Dupuy	Santa Barbara
Atec Data Service	408/246-5353	Randy Keji	Santa Clara
Automated Mayo Miley	714/540-6062	Bill Hopkins	Orange
Azimuth Bavis & Systems	415/989-1603	Chuck Heitmeier	San Francisco
Azimuth Corp	619/271-8518	Al Reetz	San Diego
Battery Weaver	415/952-7761	Brian Case	S. San Francisco
Belmar Fishing Systems	415/323-2469	Mike Ozer	Menlo Park
Belmar Tronixs Computer	213/452-9369	Andy Rigney	Santa Monica
Big Incorporated	818/762-5886	Bert Dalglish	N. Hollywood
Blake Inc.	415/992-0710	Bob Dot	Daly City
Bob Lewis Walker & Jackson	213/533-7332	Dan Tillotson	Long Beach
Bulldog Inc.	415/864-7557	Bill Kane	San Francisco
Business M. Business	619/564-2809	Larry Van Lockern	San Diego
C & S Computing & Systems	415/325-4305	Parky Knickle	Menlo Park
« Done » < More > Column: 0			

Figure 7: Session 3 Report in the Page Preview Window

Let's look at the report form you've just created and spruce it up in the Report Layout window.

### Opening a Report Form

1. Choose the **Done** push button at the bottom of the Page Preview window to return to the RQBE window.
2. Choose **Open...** from the **File** menu popup then make sure **Report** is showing on the **Type** popup control. (Figure 8)
3. Select SESSION3.FRX then choose **Open**.

A Session 3 report form appears as in Figure 9. The report form is divided into three sections or *bands*:

- The PgHead band contains information that appears at the top of each page in the report.
- The Detail band is printed once for each record that meets the selection criteria.
- The PgFoot band contains information that appears at the bottom of each page in the report.

The overall appearance of the report *form* matches the appearance of the printed report.



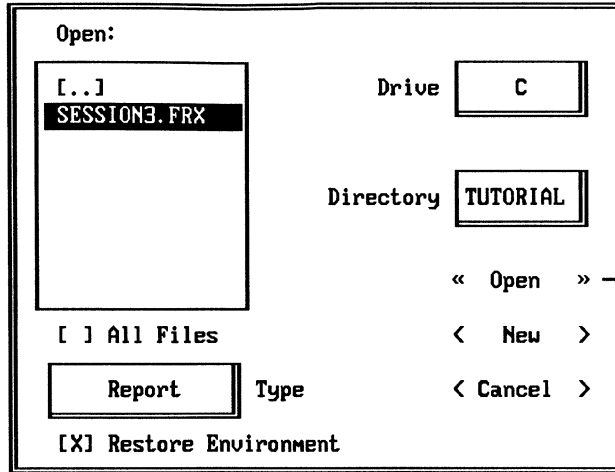


Figure 8: Open File Dialog

SESSION3.FR3

R: 0 C: 0 || Move || Page Header ||

PgHead	Company	Phone	Contact	City
PgHead				
PgHead				
PgHead				
Detail	company	phone	contact	city
PgFoot				
PgFoot				
PgFoot				
PgFoot	DATE<>			

Figure 9: Session 3 Report Form

You can change the appearance of the report by adding, moving or deleting items from the report form. These items can be plain text, fields from databases, expressions or functions. For now, you'll experiment with the text and fields.

### Moving Field Headings in a Report Form

With the keyboard:

1. Place the cursor on each field heading and press the Spacebar to select it, then press the arrow keys to center the field heading over the appropriate field. Be sure to scroll right to see all of the headings.
2. Press Enter to confirm the move.

With the mouse:

1. Point to each field heading and click to select it, then drag the heading until it is centered over the appropriate field. Be sure to scroll right to see all of the headings.
2. Press Enter to confirm the move.

### Creating and Centering Titles in a Report Form

1. Place the cursor on the top line of the PgHead band, type `Customer Phone List` then press Enter.
2. To center the title, select it and choose **Center** from the **Report** menu popup. (Figure 10)

SESSION3.FRX

R: 4 C: 62 || Move || Detail ||

Customer Phone List			
Company	Phone	Contact	Cit
company	phone	contact	city
DATE			

Figure 10: Session 3 Report Form Showing Centered Headings

**Doing the Query**

1. Choose **RQBE - SESSION 2** from the bottom of the **Window** menu popup.
2. Choose **Do Query**.

Notice that the report now reflects the changes that you made to the Session 3 report form. See Figure 11.

System File Edit Database Record Program Window RQBE

---

**Customer Phone List**

Company	Phone	Contact	City
Add Associates	415/897-2810	Len Silverman	Novato
Advantage Computer School	408/946-1317	Duane Marshall	San Jose
American Forum	805/682-5580	Gui Dupuy	Santa Barbara
Atec Data Service	408/246-5353	Randy Keji	Santa Clara
Automated Mayo Miley	714/540-6062	Bill Hopkins	Orange
Azimuth Bavis & Systems	415/989-1603	Chuck Heitmeier	San Francisco
Azimuth Corp	619/271-8518	Al Reetz	San Diego
Battery Weaver	415/952-7761	Brian Case	S. San Francisco
Belmar Fishing Systems	415/323-2469	Mike Ozer	Menlo Park
Belmar Tronixs Computer	213/452-9369	Andy Rigney	Santa Monica
Big Incorporated	818/762-5886	Bert Dalgleish	N. Hollywood
Blake Inc.	415/992-0710	Bob Dot	Daly City
Bob Lewis Walker & Jackson	213/533-7332	Dan Tillotson	Long Beach
Bulldog Inc.	415/864-7557	Bill Kane	San Francisco
Business M. Business	619/564-2809	Larry Van Lockern	San Diego
C & S Computing & Systems	415/325-4305	Parky Knickle	Menlo Park

« Done » < More > Column: 0

Figure 11: Page Preview Window Showing Centered Headings

Try making a few changes to achieve an even more professional look.

### Placing and Sizing a Box in a Report Form

1. Choose **Done** from the bottom of the Page Preview window then choose **SESSION3.FRX** from the **Window** menu popup.
2. Position the cursor in the Report Layout window where you want the box to appear.
3. Choose **Box** from the **Report** menu popup.
4. Size the blinking box so that it frames the field headings. (Figure 12)
  - With the keyboard, press the Right and Down Arrow keys to stretch the box, then press Enter.
  - With the mouse, click on the box and drag, then release the mouse button.

### Moving Fields in a Report Form

1. Move the `DATE()` field to the top left corner of the PgHead band. (Figure 12)
  - With the keyboard, position the cursor on `DATE()`, press the Spacebar to select it then press the arrow keys to move `DATE()` to the top left corner of the PgHead band.
  - With the mouse, point to `DATE()`, click to select it then drag `DATE()` to the top left corner of the PgHead band.
2. Repeat the above steps to move `PAGE` and `_PAGENO` to the top right corner of the PgHead band. You'll need to scroll right to see these fields.

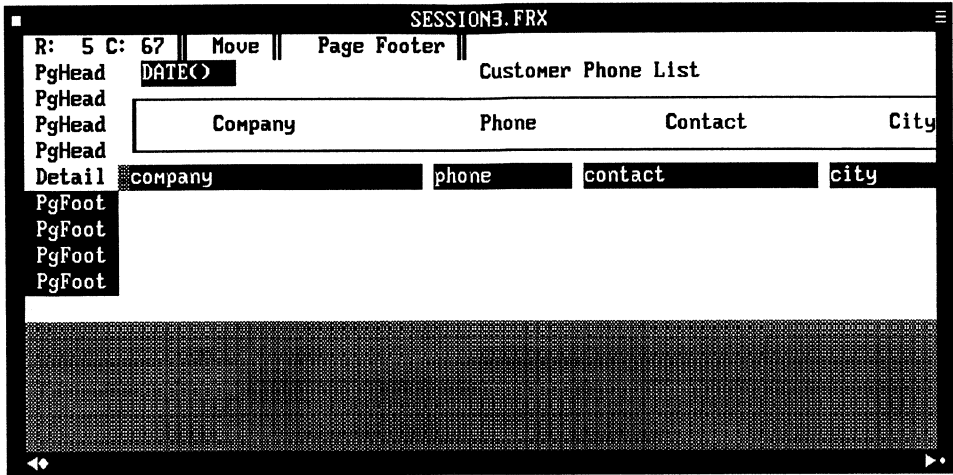


Figure 12: Report Layout Window with Box and Moved DATE( ) Field

**Doing the Query**

Choose **RQBE - SESSION 2** from the bottom of the **Window** menu popup then choose **Do Query**.

Again, the changes you made to the Session 3 report form are reflected in the report that is displayed. See Figure 13.



System File Edit Database Record Program Window RQBE				
04/04/91		Customer Phone List		Page
Company	Phone	Contact	City	S
Add Associates	415/897-2810	Len Silverman	Novato	C
Advantage Computer School	408/946-1317	Duane Marshall	San Jose	C
American Forum	805/682-5580	Gui Dupuy	Santa Barbara	C
Atec Data Service	408/246-5353	Randy Keji	Santa Clara	C
Automated Mayo Miley	714/540-6062	Bill Hopkins	Orange	C
Azimuth Bavis & Systems	415/989-1603	Chuck Heitmeier	San Francisco	C
Azimuth Corp	619/271-8518	Al Reetz	San Diego	C
Battery Weaver	415/952-7761	Brian Case	S. San Francisco	C
Belmar Fishing Systems	415/323-2469	Mike Ozer	Menlo Park	C
Belmar Tronixs Computer	213/452-9369	Andy Rigney	Santa Monica	C
Big Incorporated	818/762-5886	Bert Dalgleish	N. Hollywood	C
Blake Inc.	415/992-0710	Bob Dot	Daly City	C
Bob Lewis Walker &	213/533-7332	Dan Tillotson	Long Beach	C
Bulldog Inc.	415/864-7557	Bill Kane	San Francisco	C
Business M. Business	619/564-2809	Larry Van Lockern	San Diego	C
C & S Computing & Systems	415/325-4305	Parky Kmickle	Menlo Park	C
« Done » < More > Column: 0				

Figure 13: Page Preview Showing Box and Moved Fields

Once the report looks exactly the way that you want it to, you can change the output destination so the report is actually sent to the printer, if you have one available. If you don't have a printer, choose **Done** to return to the RQBE window then skip to the last step box.

### Changing the Output Destination

1. Choose **Done** to return to the RQBE window.
2. Check the **Options...** check box.
3. Deselect the **Preview Report/Label** check box.
4. Check the **To Printer** check box in the Output Destinations area of the RQBE Display Options dialog (Figure 14) then choose **OK**.
5. Make sure your printer is ready. If not, nothing will happen.
6. Choose **Do Query**. Figure 15 shows the printed report.

Save this report and query for later use.

### Closing RQBE and the Report Layout Window

1. Choose **Save as...** from the **File** menu popup.
2. Type `Session3` in the text box then choose **Save**.
3. Close the RQBE window.
4. Close the report window then choose **Yes** when FoxPro asks about saving changes.

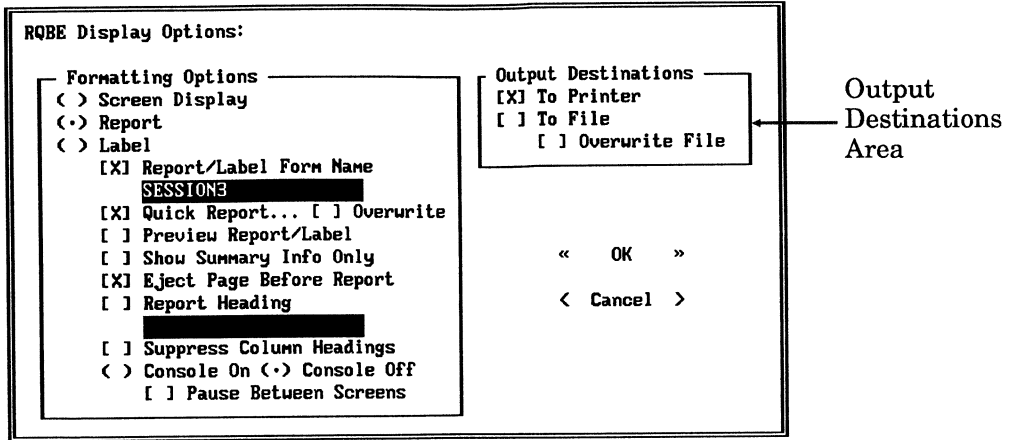


Figure 14: RQBE Display Options Dialog

04/04/91		Customer Phone List		Page	1
Company	Phone	Contact	City	St	
Add Associates	415/897-2818	Len Silverman	Novato	CA	
Advantage Computer School	408/946-1317	Duane Marshall	San Jose	CA	
American Forum	805/682-5580	Gui Dupuy	Santa Barbara	CA	
Atec Data Service	408/246-5353	Randy Keji	Santa Clara	CA	
Automated Mayo Miley	714/540-6062	Bill Hopkins	Orange	CA	
Azimuth Bavis & Systems	415/989-1603	Chuck Heitmeier	San Francisco	CA	
Azimuth Corp	619/271-8518	Al Reetz	San Diego	CA	
Battery Weaver	415/952-7761	Brian Case	S. San Francisco	CA	
Belmar Fishing Systems	415/323-2469	Mike Ozer	Menlo Park	CA	
Belmar Tronix Computer	213/452-9369	Andy Rigney	Santa Monica	CA	
Big Incorporated	818/762-5886	Bert Dalglish	N. Hollywood	CA	
Blake Inc.	415/992-0710	Bob Dot	Daly City	CA	
Bob Lewis Walker &	213/533-7332	Dan Tillotson	Long Beach	CA	
Bulldog Inc.	415/864-7557	Bill Kane	San Francisco	CA	
Business M. Business	619/564-2809	Larry Van Lockern	San Diego	CA	
C & S Computing & Systems	415/325-4305	Parky Knickle	Menlo Park	CA	
C. Graph Systems	415/229-1408	Cindy Summerley	Martinez	CA	
Cameron Design Vogelanz	714/850-4656	John Wigal	Huntington Bch	CA	
Canadian International	415/781-4504	Jerry Aluiston	San Francisco	CA	
Carolina Systems	619/481-4894	Rich Schwartz	Solano Beach	CA	
Carsonville W. B.	415/283-7568	David Reiss	Lafayette	CA	
Cascade Rumberg &	415/863-8219	Greg Gubboney	San Francisco	CA	
Cezar Beach Services	619/265-5983	Zarina Marshall	San Diego	CA	
Clover Data Inc.	415/651-8696	Bob Kieckheser	Fremont	CA	
Coleman Ltd	707/444-3350	Adam H. Weinsaft	Eureka	CA	
Computeach	415/881-2383	George Hedgepath	Hayward	CA	
Computer Bud	415/825-7484	Phil Linak	Concord	CA	
Computer Technologies	415/276-7860	John Mowery	San Leandro	CA	
Control Communication &	818/796-5398	Robert Totah	Arcadia	CA	
Corporate Romtec	714/544-2134	Kevin Driemeir	Tustin	CA	
Designer Greenhouses	714/553-5905	Bill Mostov	Irvine	CA	
Designer Computers Group	209/477-5675	Alan Au	Stockton	CA	
... Inc.	213/865-2650	Howard Stevens	Cerritos	CA	

Figure 15: Printed Report



## Reporting with Multiple Databases

In this session you'll see how easy it is to use FoxPro's RQBE to design and generate reports from multiple databases.

- Connecting multiple databases . . . page 4
- Grouping your data . . . . . page 12
- Changing band size . . . . . page 14
- Creating a computed field . . . . . page 16
- Suppressing repeated values . . . page 20

## Reporting with Multiple Databases

---

In the last session you created a phone list report using one database and RQBE. In this session you will gather information from two databases to create a report.

Begin with the query that you saved at the end of Session 3.

### Opening an Existing Query

1. Choose **Open...** from the **File** menu popup and make sure **Query** is showing on the **Type** popup control.
2. Open SESSION3.QPR. (Figure 1)

**ROBE - SESSION3**

Databases	Output Fields	Output To
<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">▶CUSTOMER</div> <div style="display: flex; justify-content: space-between;"> <span>&lt; Add &gt;</span> <span>&lt; Clear &gt;</span> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">                 ‡ 2‡ COMPANY    <input checked="" type="checkbox"/> Select Fields...                  ‡    PHONE        <input checked="" type="checkbox"/> Order By...                  ‡    CONTACT       <input checked="" type="checkbox"/> Order By...                  ‡    CITY            <input type="checkbox"/> Group By...                  ‡ 1‡ STATE         <input type="checkbox"/> Having...                  ‡             </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Report/Label</div> <div style="display: flex; justify-content: space-between;"> <span>[X] Options...</span> <span>&lt; See SQL &gt;</span> </div> <div style="display: flex; justify-content: space-between;"> <span>&lt; Or &gt;</span> <span>&lt; Do Query &gt;</span> </div>
<b>Field Name</b>	<b>NOT</b>	<b>Example</b>
<div style="border: 1px solid black; padding: 2px;">                 ‡ CUSTOMER.STATE             </div>	<div style="border: 1px solid black; padding: 2px;"> <input type="checkbox"/> Like             </div>	<div style="border: 1px solid black; padding: 2px;">                 CA             </div>
		U=L <b>Select Criteria</b> <Insert> <Remove> < Or >

Figure 1: SESSION3.QPR

You'll send the output to a Browse window first so that you can scroll through the data, then you'll add the INVOICES database.

To report on multiple databases, the databases must have something in common. CUSTOMER.DBF and INVOICES.DBF both have CNO, a customer number, in common. CNO is a link between CUSTOMER.DBF and INVOICES.DBF that is sometimes called the *join condition*.

Your report will list invoices for each company in California.

### Connecting Multiple Databases

1. Choose **Browse** from the **Output To** popup.
2. Choose the **Add** push button below the **Databases** list, then choose INVOICES.DBF. The RQBE Join Condition dialog appears.
3. Select INVOICES.CNO from the left popup. **Like** appears on the center popup by default. Select CUSTOMER.CNO from the right popup. (Figure 2)
4. Choose **OK**. The solid bar next to INVOICES.CNO indicates that CUSTOMER.DBF and INVOICES.DBF are linked. (Figure 3)
5. Choose the **Select Fields...** check box in the RQBE window.
6. Remove CUSTOMER.CITY and CUSTOMER.STATE from the **Selected Output** list.
7. Select INVOICES.IDATE and INVOICES.ITOTAL from the **Database Fields** list and choose **Move** →. You'll have to scroll to see these fields.
8. Choose **OK**. The RQBE window appears as in Figure 3.
9. Choose **Do Query**. The results appear in a Browse window as in Figure 4.



**RQBE Join Condition:**

NOT

Ignore Upper/Lower Case

< OK >

< Cancel >

Figure 2: RQBE Join Condition Dialog

**RQBE - SESSION3**

<p><b>Databases</b></p> <p>CUSTOMER ▶ INVOICES</p> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <p>‡ 1† COMPANY ‡ PHONE ‡ CONTACT ‡ IDATE ‡ ITOTAL</p> <p><input type="checkbox"/> Select Fields... <input type="checkbox"/> Order By... <input type="checkbox"/> Group By... <input type="checkbox"/> Having...</p>	<p><b>Output To</b></p> <p><input type="text" value="Browse"/></p> <p><input type="checkbox"/> Options...</p> <p>&lt; See SQL &gt; &lt;&lt; Do Query &gt;&gt;</p>
---	--	---

Field Name	NOT	Example	U=L	Select Criteria
‡ INVOICES.CNO	<input type="checkbox"/> Like	CUSTOMER.CNO	<input type="checkbox"/>	<Insert>
‡ CUSTOMER.STATE	<input type="checkbox"/> Like	CA	<input type="checkbox"/>	<Remove>

< Or >

Figure 3: RQBE Window

SESSION3			
Company	Phone	Contact	Idate
Atec Data Service	408/246-5353	Randy Keji	05/17/
Atec Data Service	408/246-5353	Randy Keji	05/30/
Atec Data Service	408/246-5353	Randy Keji	05/26/
Atec Data Service	408/246-5353	Randy Keji	05/31/
Atec Data Service	408/246-5353	Randy Keji	05/28/
Automated Mayo Miley	714/540-6862	Bill Hopkins	05/08/
Azimuth Corp	619/271-8518	Al Reetz	05/08/
Belmar Tronixs Computer Compuserve	213/452-9369	Andy Rigney	05/10/
C. Graph Systems	415/229-1408	Cindy Summerley	05/12/
Carsonville W. B. Associates	415/283-7568	David Reiss	05/07/
Computeach	415/881-2383	George Hedgepath	05/18/
Computer Technologies	415/276-7860	John Mowery	05/11/
Designer Greenhouses	714/553-5905	Bill Mostov	05/09/
Designer Greenhouses	714/553-5905	Bill Mostov	05/19/
Designer Komputers Group	209/477-5675	Alan Au	05/12/
Dr. Micro Consulting	408/733-1479	Oliver Ansarti	05/15/

Figure 4: Query Results

The fields look fine but if a company has more than one invoice, the invoices are not in any particular order.

Let's order the invoices according to company and invoice date and do the query again.

### Ordering Fields

1. Close the Browse window.
2. Choose the **Order By...** check box.
3. Select INVOICES.IDATE in the **Selected Output** list and choose **Move** →.
4. Choose **OK**. The RQBE window appears. (Figure 5)
5. Choose **Do Query**. The data appears in a Browse window. (Figure 6)

**RQBE - SESSION3**

<p><b>Databases</b></p> <p>CUSTOMER ▶ INVOICES</p> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <p>↓ ↑ COMPANY [X] Select Fields...          ↓ PHONE [X] Order By...          ↓ CONTACT [ ] Group By...          ↓ ↑ IDATE [ ] Having...          ↓ ITOTAL</p>	<p><b>Output To</b></p> <p>Browse</p> <p>SESSION3 [ ] Options...</p> <p>&lt; See SQL &gt; &lt;&lt; Do Query &gt;&gt;</p>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Field Name</th> <th style="text-align: left;">NOT</th> <th style="text-align: left;">Example</th> <th style="text-align: left;">U=L</th> <th style="text-align: left;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>↓ INVOICES.CNO</td> <td>[ ] Like</td> <td>CUSTOMER.CNO</td> <td>[ ]</td> <td>&lt;Insert&gt;</td> </tr> <tr> <td>↓ CUSTOMER.STATE</td> <td>[ ] Like</td> <td>CA</td> <td>[ ]</td> <td>&lt;Remove&gt;</td> </tr> </tbody> </table> <p style="text-align: right;">&lt; Or &gt;</p>			Field Name	NOT	Example	U=L	Select Criteria	↓ INVOICES.CNO	[ ] Like	CUSTOMER.CNO	[ ]	<Insert>	↓ CUSTOMER.STATE	[ ] Like	CA	[ ]	<Remove>
Field Name	NOT	Example	U=L	Select Criteria													
↓ INVOICES.CNO	[ ] Like	CUSTOMER.CNO	[ ]	<Insert>													
↓ CUSTOMER.STATE	[ ] Like	CA	[ ]	<Remove>													

Figure 5: RQBE Window

**SESSION3**

Company	Phone	Contact	Idate
Atec Data Service	408/246-5353	Randy Keji	05/17/
Atec Data Service	408/246-5353	Randy Keji	05/26/
Atec Data Service	408/246-5353	Randy Keji	05/28/
Atec Data Service	408/246-5353	Randy Keji	05/30/
Atec Data Service	408/246-5353	Randy Keji	05/31/
Automated Mayo Miley	714/540-6062	Bill Hopkins	05/08/
Azimuth Corp	619/271-8518	Al Reetz	05/08/
Belmar Tronixs Computer Compuserve	213/452-9369	Andy Rigney	05/10/
C. Graph Systems	415/229-1408	Cindy Summerley	05/12/
Carsonville W. B. Associates	415/283-7568	David Reiss	05/07/
Computeach	415/881-2383	George Hedgepath	05/18/
Computer Technologies	415/276-7860	John Mouery	05/11/
Designer Greenhouses	714/553-5905	Bill Mostov	05/09/
Designer Greenhouses	714/553-5905	Bill Mostov	05/19/
Designer Computers Group	209/477-5675	Alan Au	05/12/
Dr. Micro Consulting	408/733-1479	Oliver Ansarti	05/15/

Figure 6: Query Results

Now that the information is well organized, let RQBE build a report for you.

### Generating a Report with RQBE

1. Close the Browse window.
2. Choose **Report/Label** on the **Output To** popup in the RQBE window.
3. Check the **Options...** check box in the RQBE window.
4. Choose the **Report** radio button in the RQBE Display Options dialog.
5. Choose the **Quick Report...** check box.
6. In the RQBE Quick Report dialog, type `SESSION4` in the Save as text box (Figure 7) then choose **OK**.
7. Choose **OK** in the RQBE Display Options dialog.
8. Choose **Do Query**. The Page Preview window appears. (Figure 8)

**RQBE Quick Report:**

(.) Column Layout      **Field1 Field2**  
 ( ) Form Layout        xxxxxx xxxxxx  
                              xxxxxx xxxxxx  
                              xxxxxx xxxxxx

Report Width **80**

Save as **SESSION4**

«    OK    »      <    Clear    >

Figure 7: RQBE Quick Report Dialog

System File Edit Database Record Program Window RQBE

Company	Phone	Contact	Idate	Itotal
Atec Data Service	408/246-5353	Randy Keji	05/17/90	2721.
Atec Data Service	408/246-5353	Randy Keji	05/26/90	441.
Atec Data Service	408/246-5353	Randy Keji	05/28/90	744.
Atec Data Service	408/246-5353	Randy Keji	05/30/90	163.
Atec Data Service	408/246-5353	Randy Keji	05/31/90	762.
Automated Mayo Miley	714/540-6062	Bill Hopkins	05/08/90	2336.
Azimuth Corp	619/271-8518	Al Reetz	05/08/90	2047.
Belmar Tronixs Computer	213/452-9369	Andy Rigney	05/10/90	2353.
C. Graph Systems	415/229-1408	Cindy Summerley	05/12/90	1642.
Carsonville W. B. Associates	415/283-7568	David Reiss	05/07/90	1100.
Computeach	415/881-2383	George Hedgepath	05/18/90	1379.
Computer Technologies	415/276-7860	John Mowery	05/11/90	1716.
Designer Greenhouses	714/553-5905	Bill Mostov	05/09/90	1543.
Designer Greenhouses	714/553-5905	Bill Mostov	05/19/90	1262.
Designer Computers Group	209/477-5675	Alan Au	05/12/90	1104.
Dr. Micro Consulting	408/733-1479	Oliver Ansarti	05/15/90	1614.

« Done » < More > Column: 0

Figure 8: Session 4 Report Form in the Page Preview Window

Now try some cosmetic work.

### **Moving Fields and Placing a Box in a Report**

1. Choose **Done** in the Page Preview window.
2. Choose **Open...** from the **File** menu popup and make sure **Report** is showing on the **Type** popup control.
3. Select SESSION4.FRX then choose **Open**. The Report Layout window appears. (Figure 9)
4. Move the field headings down to the third PgHead band over the appropriate fields.
5. Move the DATE( ) field to the top left corner of the PgHead band. Scroll right to see the \_PAGENO field. Move \_PAGENO to the top right corner of the PgHead band. Move PAGE also.
6. Type Invoice Report on the top line of the PgHead band and press Enter.
7. Center the title.
8. Place and size a box so that it frames the field headings. Your screen should look like Figure 10.

SESSION4.FRX

R: 4 C: 0 || Move || Detail ||

PgHead	Company	Phone	Contact	Idate
PgHead				
PgHead				
PgHead				
Detail	company	phone	contact	idate
PgFoot				
PgFoot				
PgFoot				
PgFoot	DATE()			

Figure 9: Session 4 Report Form

SESSION4.FRX

R: 4 C: 0 || Move || Detail ||

PgHead	DATE()	Invoice Report		
PgHead				
PgHead	Company	Phone	Contact	Idate
PgHead				
Detail	company	phone	contact	idate
PgFoot				
PgFoot				
PgFoot				
PgFoot				

Figure 10: Session 4 Report Form with Title, Centered Headings and Box

When your data is ordered by a field, such as **COMPANY**, you can use the Report Writer to group all the information about each company.

In these next few steps you will create a data grouping for the **COMPANY** field. Let's do it now.

### **Grouping Your Data**

1. Choose **Data Grouping...** from the **Report** menu popup. The Group dialog appears.
2. Choose the **Add** push button in the Group dialog. The Group Info dialog appears.
3. Type `company` in the Group... text box. (Figure 11)
4. Choose **OK** in the Group Info dialog. The Group dialog appears. (Figure 12)
5. Choose **OK** in the Group dialog.



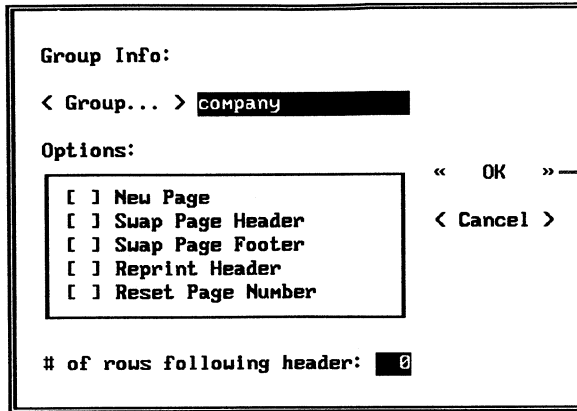


Figure 11: Group Info Dialog

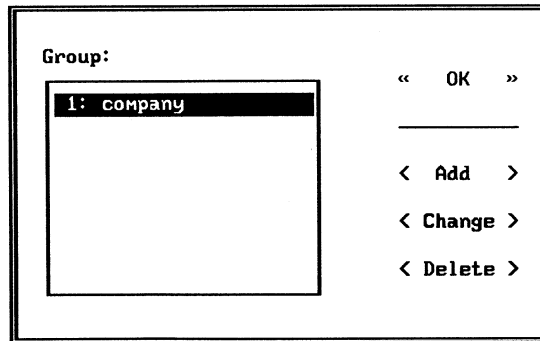


Figure 12: Group Dialog

When you grouped the data, the Report Writer added two bands to the report form:

- The *group header band*, just above the detail band, is printed each time the group changes.
- The *group footer band*, just below the detail band, is printed each time the group changes.

In the current example, the group header and group footer will be printed each time COMPANY changes.

### Changing Band Size and Copying a Field

1. Change the size of the group footer band.
  - With the keyboard, place the cursor in the group footer area of the report form and choose **Add Line** from the **Report** menu popup.
  - With the mouse, point to “1-company” in the group footer band and drag the mouse down.
2. Select ITOTAL and choose **Copy** from the **Edit** menu popup. Place the cursor in the bottom line of the group footer band directly beneath the “I” in the ITOTAL field and choose **Paste** from the **Edit** menu popup. (Figure 13)

Once information is grouped, you can perform calculations on each group, put headers and footers on each group, and so on.

Group Header Band

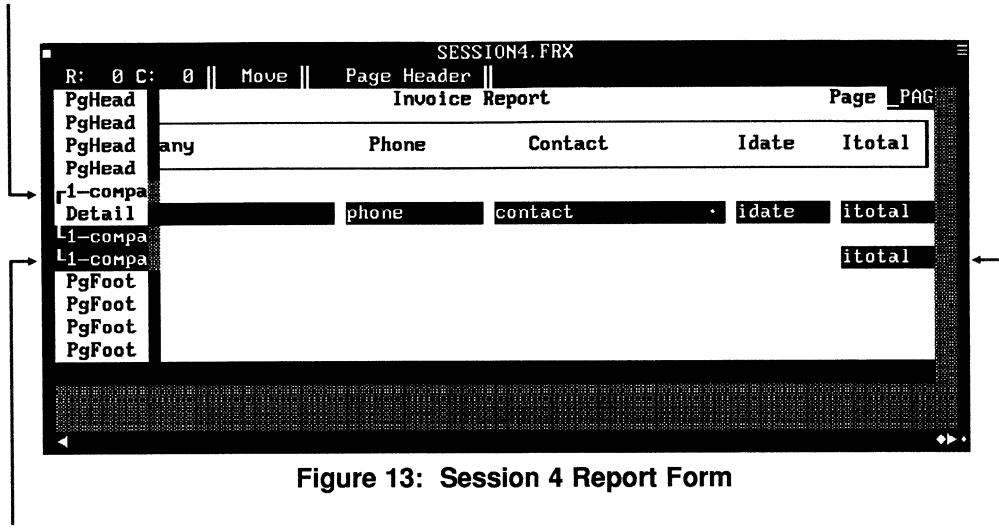


Figure 13: Session 4 Report Form

Group Footer Band with Added Line

Copied ITOTAL Field

The group footer is also used to do calculations on the information that appears in the details for the group.

In the group footer for ITOTAL, let's add the data in all the ITOTAL fields in the group.

#### **Creating a Computed Field**

1. In the group footer, choose **ITOTAL** to display the Report Expression dialog.
2. Choose the **Calculate...** check box to display the Calculate Field dialog. (Figure 14)
3. Choose the **Sum** radio button then choose **OK**. The Report Expression dialog reappears. (Figure 15)
4. Choose **OK**.

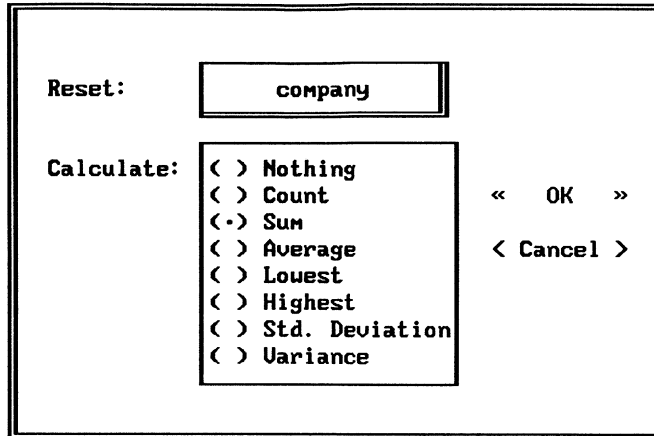


Figure 14: Calculate Field Dialog

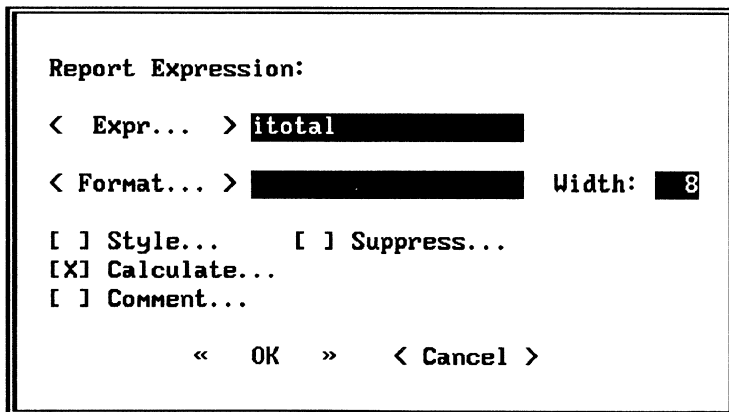


Figure 15: Report Expression Dialog

Place a line between the two ITOTAL fields, then do the query to see the results of your handiwork.

### **Drawing a Line**

1. Place the cursor below the "I" in the top ITOTAL field.
2. Choose **Box** from the **Report** menu popup.
3. Turn the blinking box into a line. (Figure 16)
  - With the keyboard, use the arrow keys to shrink the box to a line, press the Right Arrow until the line is the desired length then press Enter.
  - With the mouse, click on the box and drag until the box has no depth and the line is the desired length, then release the mouse button.

SESSION4.FRX

R: 0 C: 0 || Move || Page Header ||

Invoice Report					Page PAG
any	Phone	Contact	Idate	Itotal	
r1-compa					
Detail	phone	contact	idate	itotal	
l1-compa					
l1-compa				itotal	
PgFoot					
PgFoot					
PgFoot					
PgFoot					

Figure 16: Session 4 Report Form

### Doing the Query

1. Choose **RQBE – SESSION3** from the **Window** menu popup.
2. Choose **Do Query**. The Page Preview window appears. (Figure 17)

The report looks very good, but let's make it even better.

When a company has more than one invoice, the company information is repeated for each invoice.

Your report will be easier to read if this information is not repeated for each invoice.

### Suppressing Repeated Values in a Report

1. Choose **Done** in the Page Preview window.
2. Choose **SESSION4.FRX** from the **Window** menu popup.
3. Select **COMPANY** and choose **Field...** from the Report menu popup. The Report Expression dialog appears.
4. Check the **Suppress...** check box. The Suppress Repeated Values dialog appears.
5. Choose the **On** radio button in the Suppress Repeated Values dialog (Figure 18) then choose **OK**.
6. Choose **OK** in the Report Expression dialog.



System File Edit Database Record Program Window RQBE

04/30/91 Invoice Report Page

Company	Phone	Contact	Idate	Itotal
Atec Data Service	408/246-5353	Randy Keji	05/17/90	2721.
Atec Data Service	408/246-5353	Randy Keji	05/26/90	441.
Atec Data Service	408/246-5353	Randy Keji	05/28/90	744.
Atec Data Service	408/246-5353	Randy Keji	05/30/90	163.
Atec Data Service	408/246-5353	Randy Keji	05/31/90	762.
				4833.
Automated Mayo Miley	714/540-6062	Bill Hopkins	05/08/90	2336.
				2336.
Azimuth Corp	619/271-8518	Al Reetz	05/08/90	2047.
				2047.
Belmar Tronixs Computer	213/452-9369	Andy Rigney	05/10/90	2353.
				2353.

<< Done >> < More > Column: 0

Figure 17: Session 4 Report in Page Preview Window

Suppress Repeated Values:

On       Off

<< OK >>

Reset:      < Cancel >

company

Figure 18: Suppress Repeated Values Dialog

This report will look better with a blank line between the invoices for each different company.

Add a line to the group footer band to place a space between groups.

### **Changing the Size of a Band**

1. Add a line to the group footer band. (Figure 19)
2. Move ITOTAL back up to the second group footer band, under the line. (Figure 19)
3. Choose **RQBE – SESSION3** from the **Window** menu popup.
4. Choose **Do Query**. Your report should appear as in Figure 20.

SESSION4.FRX  
R: 0 C: 0 || Move || Page Header ||

Invoice Report Page PAG

any	Phone	Contact	Idate	Itotal
1-compa				
Detail				
	phone	contact	idate	itotal
1-compa				
1-compa				itotal
1-compa				
PgFoot				
PgFoot				
PgFoot				
PgFoot				

Figure 19: Session 4 Report Form

Group Footer Band with Added Line

Space Added by Group Footer Band

System File Edit Database Record Program Window RQBE

04/30/91 Invoice Report Page

Company	Phone	Contact	Idate	Itotal
Atec Data Service	408/246-5353	Randy Keji	05/17/90	2721.
	408/246-5353	Randy Keji	05/26/90	441.
	408/246-5353	Randy Keji	05/28/90	744.
	408/246-5353	Randy Keji	05/30/90	163.
	408/246-5353	Randy Keji	05/31/90	762.
				4833.
Automated Mayo Miley	714/540-6062	Bill Hopkins	05/08/90	2336.
				2336.
Azimuth Corp	619/271-8518	Al Reetz	05/08/90	2047.
				2047.

<< Done >> < More > Column: 0

Figure 20: Session 4 Report with Repeated Values Suppressed

Now that's a polished report! Go ahead and send this report to the printer, if you have one available. If you don't have a printer, choose **Done** from the Page Preview window then skip to the last step box.

### **Sending a Report to the Printer**

1. Choose **Done** from the Page Preview window.
2. Choose the **Options...** check box in the RQBE window.
3. *Uncheck* the **Preview Report/Label** check box in the RQBE Display Options dialog.
4. Choose the **To Printer** check box in the Output Destinations area. (Figure 21)
5. Choose **OK**.
6. Choose **Do Query**. The printed report is represented in Figure 22.

Save this report and query and take a break.

### **Saving a Report and Query**

1. Choose **Save as...** from the **File** menu popup.
2. Type `Session 4` in the text box, then choose **Save**.
3. Close the RQBE window.
4. Close the report window then choose **Yes** when FoxPro asks about saving changes.

**RQBE Display Options:**

<p><b>Formatting Options</b></p> <p><input type="checkbox"/> Screen Display</p> <p><input checked="" type="checkbox"/> Report</p> <p><input type="checkbox"/> Label</p> <p><input checked="" type="checkbox"/> Report/Label Form Name SESSION4.FRX</p> <p><input checked="" type="checkbox"/> Quick Report... <input type="checkbox"/> Overwrite</p> <p><input type="checkbox"/> Preview Report/Label</p> <p><input type="checkbox"/> Show Summary Info Only</p> <p><input checked="" type="checkbox"/> Eject Page Before Report</p> <p><input type="checkbox"/> Report Heading</p> <p><input type="checkbox"/> Suppress Column Headings</p> <p><input type="checkbox"/> Console On <input checked="" type="checkbox"/> Console Off</p> <p><input type="checkbox"/> Pause Between Screens</p>	<p><b>Output Destinations</b></p> <p><input checked="" type="checkbox"/> To Printer</p> <p><input type="checkbox"/> To File</p> <p><input type="checkbox"/> Overwrite File</p>
---	--

« OK »

< Cancel >

Figure 21: RQBE Display Options Dialog

05/01/91		Invoice Report		Page	1
Company	Phone	Contact	IDate	ITotal	
Atec Data Service	408/246-5353	Randy Keji	05/17/90	2721.19	
		Randy Keji	05/26/90	441.91	
		Randy Keji	05/28/90	744.49	
		Randy Keji	05/30/90	163.72	
		Randy Keji	05/31/90	762.56	
				4833.87	
Automated Mayo Miley	714/540-6062	Bill Hopkins	05/08/90	2336.34	
				2336.34	
Azimuth Corp	619/271-8518	Al Reetz	05/08/90	2047.08	
				2047.08	
Belmar Tronixs Computer	213/452-9369	Andy Rigney	05/10/90	2353.43	
				2353.43	
C. Graph Systems	415/229-1408	Cindy Summerley	05/12/90	1642.05	
				1642.05	
Carsonville W. B. Associates	415/283-7568	David Reiss	05/07/90	1100.24	
				1100.24	
Computeach	415/881-2383	George Hedgepath	05/18/90	1379.92	
				1379.92	
er Technologies	415	Query	05/11/90		

Figure 22: Printed Report



## More Reporting

In this session you'll learn to include formatted fields, functions and summary bands in your reports — with ease.

- Including functions in a query . . . . page 4
- Grouping data . . . . . page 8
- Ordering data by functions . . . . page 10
- Formatting data . . . . . page 18
- Creating a summary band . . . . . page 24

## More Reporting

---

In the last session you used RQBE to design and generate a report using information from two databases. In this session you'll learn to include functions and group the data in your query.

Begin by creating a new query.

### Opening the RQBE Window

1. Choose **New...** from the **File** menu popup, choose the **Query** radio button then choose **OK**.
2. Select **CUSTOMER.DBF** then choose **Open**. The RQBE window appears as in Figure 1.



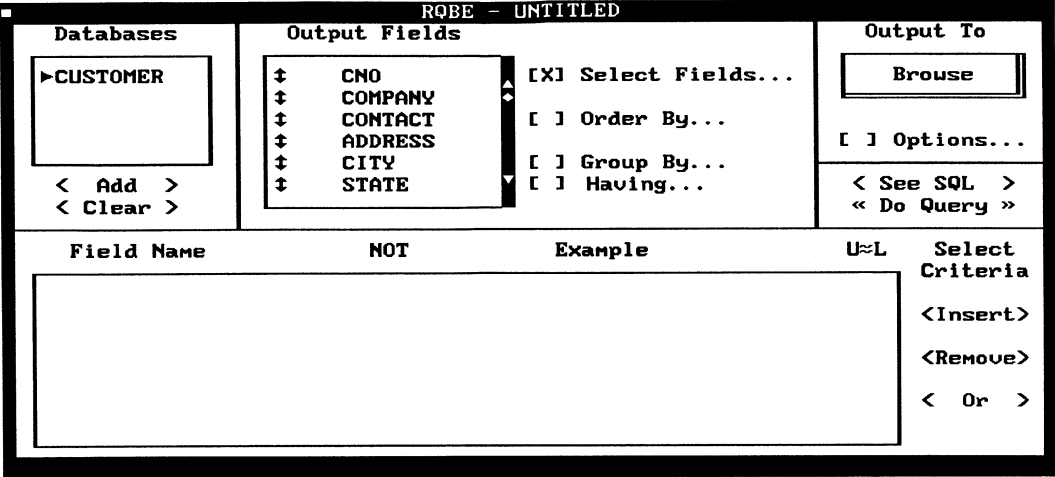


Figure 1: RQBE Window

Previously, you've specified fields to include in the query output. You'll now learn to include *functions*. The Sum function is one type of function that adds information in a field.

The results of a specified function appear as a column in your Browse window or report. Try specifying a few functions.

### Including Functions in a Query

1. Choose the **Select Fields...** check box, then choose **Remove All** to clear the **Selected Output** list.
2. Choose CUSTOMER.STATE from the **Database Fields** list and choose **Move** →.
3. For each bullet line below, select the first item from the **Functions** popup and select the second item from the corresponding submenu (Figure 2) then choose **Move** →.
  - **AVG( )** and **CUSTOMER.YTDPURCH**
  - **COUNT( )** and \*
  - **SUM( )** and **CUSTOMER.YTDPURCH**
  - **MIN( )** and **CUSTOMER.YTDPURCH**
  - **MAX( )** and **CUSTOMER.YTDPURCH**
4. When the RQBE Select Fields dialog appears as in Figure 3, choose **OK**.

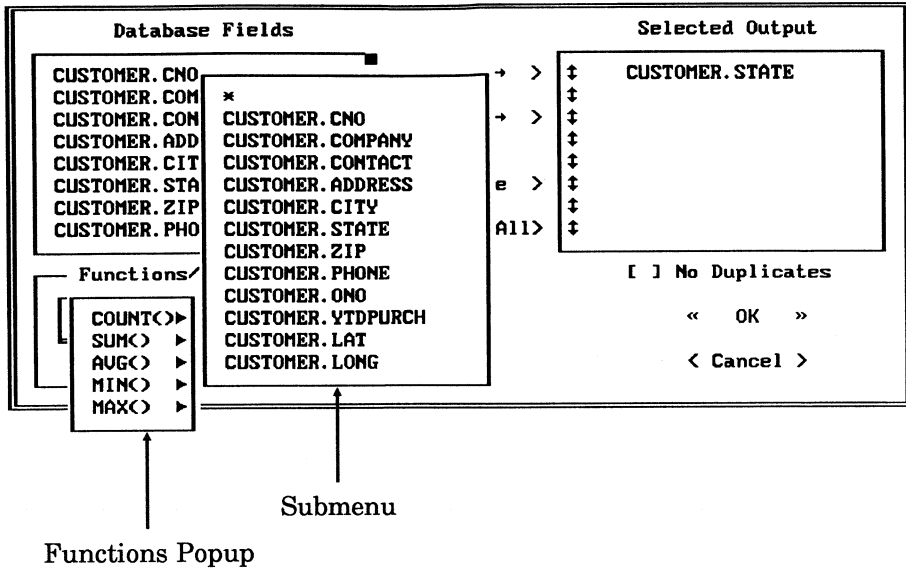


Figure 2: RQBE Select Fields Dialog

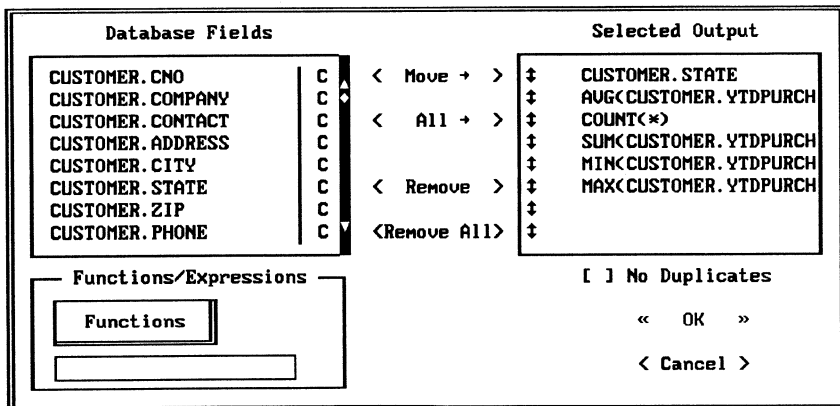


Figure 3: RQBE Select Fields Dialog with Functions/Fields Selected

Now that you have selected the fields, you can order them by state.

**Ordering the Data by State**

1. Choose the **Order By...** check box in the RQBE window.
2. Move CUSTOMER.STATE to the **Ordering Criteria** list (Figure 4), then choose **OK**.

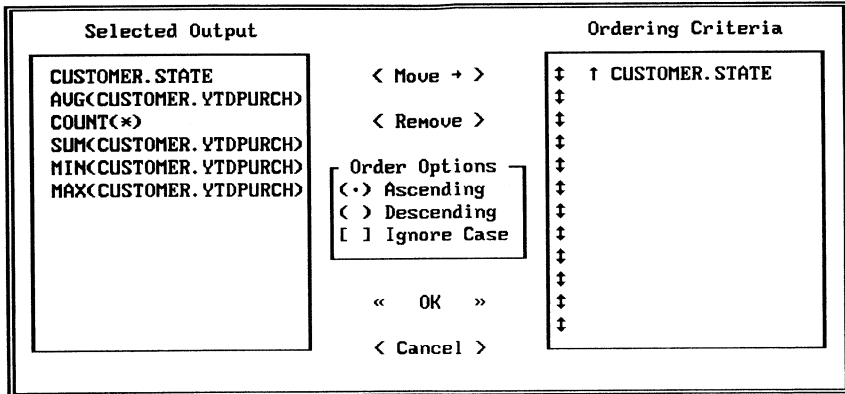


Figure 4: RQBE Order By Dialog

**Group By....** is the next new feature that you'll use. **Group By...** takes your data and groups it based on fields and functions that you specify.

In this report you want the information grouped by state. Go ahead and group the data by state.

#### **Grouping the Data by State**

1. Choose the **Group By...** check box in the RQBE window.
2. Move CUSTOMER.STATE to the **Group By Fields** list (Figure 5), then choose **OK**.

You are now ready to do the query and see the results.

#### **Doing the Query**

1. Choose **Do Query**.
2. Size the Browse window so that it stretches across your screen. (Figure 6)

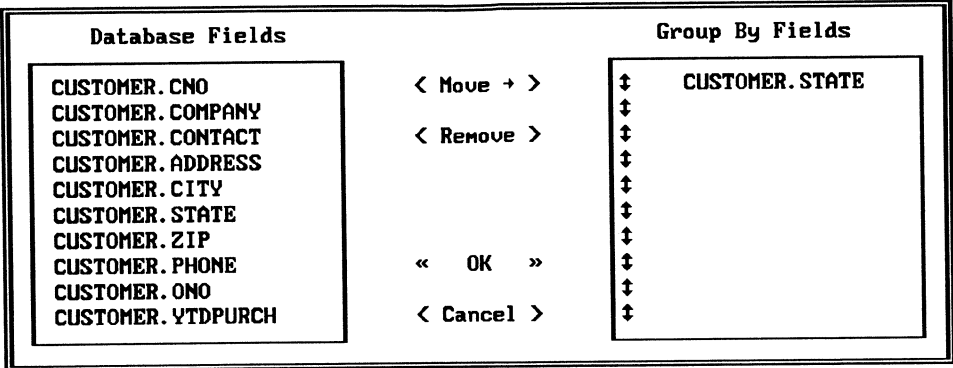


Figure 5: RQBE Group By Dialog

QUERY A					
State	Avg_ytdpur	Cnt	Sum_ytdpur	Min_ytdpur	Max_ytdpur
AK	14820.12	1	14820.12	14820.12	14820.12
AL	6271.24	2	12542.48	2244.58	10297.90
AR	1688.07	1	1688.07	1688.07	1688.07
AZ	3910.37	8	31282.95	348.34	17777.06
BC	2200.21	1	2200.21	2200.21	2200.21
CA	3713.22	123	456726.45	18.16	17623.25
CO	2916.69	9	26250.20	161.70	12995.31
CT	1843.28	9	16589.55	80.04	3452.82
DC	44.50	1	44.50	44.50	44.50
DL	283.93	1	283.93	283.93	283.93
FL	3237.44	25	80936.02	129.22	16005.92
GA	3224.21	12	38690.51	205.14	12277.45
HI	7296.10	3	21888.29	2982.70	9829.03
IA	1947.91	2	3895.81	335.37	3560.44
ID	4399.12	1	4399.12	4399.12	4399.12
IL	3266.08	24	78386.02	58.89	7919.49
IN	2430.33	5	12151.66	1336.81	5311.38
KS	956.69	3	2870.07	247.08	2074.65

Figure 6: Browse Window with Functions

That was pretty amazing, but “you ain’t seen nothin’ yet!” How about organizing the data by average so that the company with the highest average year-to-date purchases is displayed first, followed by the company with the next highest average, and so on.

As it is written, so it shall be.

**Ordering the Data by Average Year-to-Date Purchases**

1. Close the Browse window.
2. Choose the **Order By...** check box.
3. Remove CUSTOMER.STATE from the **Ordering Criteria** list.
4. Choose the **Descending** radio button in the Order Options area of the RQBE Order By dialog.
5. Move **AVG(CUSTOMER.YTDPURCH)** to the **Ordering Criteria** list (Figure 7) then choose **OK**.
6. Choose **Do Query**. The Browse window appears. (Figure 8)

You can order by functions as easily as by fields!



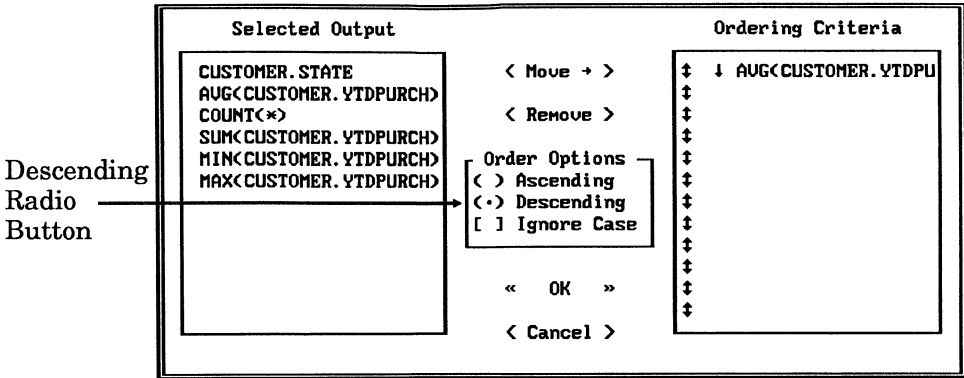


Figure 7: RQBE Order By Dialog

QUERY					
State	Avg_ytdpur	Cnt	Sum_ytdpur	Min_ytdpur	Max_ytdpur
AK	14820.12	1	14820.12	14820.12	14820.12
WV	9558.62	2	19117.23	4323.57	14793.66
HI	7296.10	3	21888.29	2982.70	9829.03
AL	6271.24	2	12542.48	2244.58	10297.90
KY	5638.50	1	5638.50	5638.50	5638.50
MN	5276.38	6	31658.29	1123.43	11707.61
NM	5019.53	1	5019.53	5019.53	5019.53
ID	4399.12	1	4399.12	4399.12	4399.12
PA	4185.73	14	58600.16	595.46	11606.18
WA	4132.30	7	28926.07	1210.92	11433.87
UT	4033.53	6	24201.20	1187.86	12485.77
AZ	3910.37	8	31282.95	348.34	17777.06
LA	3838.72	4	15354.89	926.39	10974.47
CA	3713.22	123	456726.45	18.16	17623.25
OH	3628.33	16	58053.23	136.77	11174.70
NY	3628.19	46	166896.89	32.50	17548.14
MT	3601.33	1	3601.33	3601.33	3601.33
MI	3293.63	10	32936.34	350.34	9521.57

Figure 8: Browse Window with Companies Ordered By Average Year-to-Date Purchases

Now that you have the data you want, try putting it into a report form and massaging it into shape.

### Generating a Report

1. Close the Browse window.
2. Select **Report/Label** from the **Output To** popup.
3. Choose the **Options...** check box to display the RQBE Display Options dialog.
4. Choose the **Report** radio button.
5. Choose the **Quick Report...** check box.
6. Type `SESSION5` in the Save as text box in the RQBE Quick Report dialog (Figure 9) then choose **OK**.
7. Choose **OK** in the RQBE Display Options dialog.
8. Choose **Do Query**. The Page Preview window displays your results. (Figure 10)

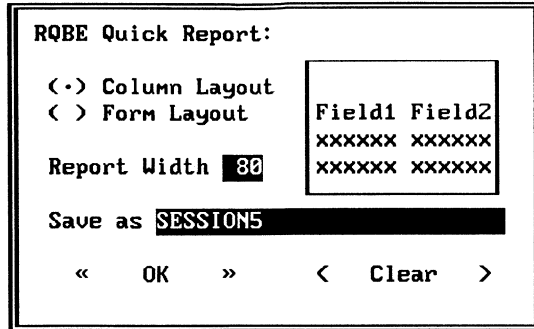


Figure 9: RQBE Quick Report Dialog

State	Avg_ytdpur	Cnt	Sum_ytdpur	Min_ytdpur	Max_ytdpur
AK	14820.12	1	14820.12	14820.12	14820.12
WU	9558.62	2	19117.23	4323.57	14793.66
HI	7296.10	3	21888.29	2982.70	9829.03
AL	6271.24	2	12542.48	2244.58	10297.90
KY	5638.50	1	5638.50	5638.50	5638.50
MN	5276.38	6	31658.29	1123.43	11707.61
NM	5019.53	1	5019.53	5019.53	5019.53
ID	4399.12	1	4399.12	4399.12	4399.12
PA	4185.73	14	58600.16	595.46	11606.18
WA	4132.30	7	28926.07	1210.92	11433.87
UT	4033.53	6	24201.20	1187.86	12485.77
AZ	3910.37	8	31282.95	348.34	17777.06
LA	3838.72	4	15354.89	926.39	10974.47
CA	3713.22	123	456726.45	18.16	17623.25
OH	3628.33	16	58053.23	136.77	11174.70
NY	3628.19	46	166896.89	32.50	17548.14

« Done » < More > Column: 0

Figure 10: Page Preview Window with Session 5 Report

Let's make the data really look great.

Take a look at the report form you just created.

### **Opening a Report Form**

1. Choose **Done** in the Page Preview window.
2. Choose **Open...** from the **File** menu popup and make sure **Report** is showing on the **Type** popup control.
3. Select `SESSION5.FRX` then choose **Open**. The report is displayed. (Figure 11)

As you can see, **Quick Report...** places fields into the Report Layout window in a predictable way.

The screenshot shows a report window titled "SESSION5.FRX". At the top, it displays "R: 4 C: 0" and "Move" and "Detail" options. The table structure is as follows:

PgHead	State	Avg_ytdpur	Cnt	Sum_ytdpur	Min_ytdpur	Max_ytd
PgHead						
PgHead						
PgHead						
Detail	st	avg_ytdpur	cnt	sum_ytdpur	min_ytdp	max_ytd
PgFoot						
PgFoot						
PgFoot						
PgFoot	DATE(<)					

The bottom portion of the report area is filled with a dense grid of small, illegible characters, likely representing a large volume of data or a corrupted printout.

Figure 11: Session 5 Report Form

Take a moment to rearrange the header information to suit your tastes. (Because we weren't sure what flavors you prefer, our example may look a little different than yours.)

### **Rearranging and Editing Fields in a Report Form**

1. Edit five of the field headings:
  - Select the avg\_ytdpur heading and choose **Text** from the **Report** menu popup. You can now backspace, delete and type just as you would in a word processor. Change the heading to Avg and press Enter.
  - Repeat the previous step for the cnt, sum\_ytdpur, min\_ytdpur and max\_ytdpur field headings so they appear as Count, Sum, Min and Max.
2. Move the field headings down to the third Page Header band then center them over the appropriate fields.
3. Draw a box around the field headings. You may have to move the fields and field headings to the right slightly before you draw the box, as Figure 12 shows.
4. Move the DATE(), PAGE and \_PAGENO fields to the top line in the Page Header.

The screenshot shows a report window titled "SESSION5.FRX". The window contains a table with the following structure:

State	Avg	Count	Sum	Min	Max
st	avg_ytdpur	cnt	sum_ytdpur	min_ytdp	max_ytdp

The table is displayed in a window with a menu bar and a status bar. The menu bar includes "R: 0 C: 58", "Move", and "Page Header". The status bar includes "DATE" and "Page\_PAG".

Figure 12: Session 5 Report Form with Edited and Rearranged Headings and Box

Because the numbers in this report represent dollar amounts, it would be nice if they *looked* like dollar amounts in the report. To accomplish this, you need to use formats.

When you specify a format, you tell FoxPro how the information in a field should appear. In your report, you want the information to appear like a dollar amount. Follow these steps, then we'll discuss them in more detail.

### **Formatting Data in a Report**

1. Choose the AVG\_YTDPUR field. Be sure to select the field and not the field heading.
  - With the keyboard, position the cursor on the field and press Enter.
  - With the mouse, double-click on the field.
2. The Report Expression dialog appears with the field automatically entered in the **Expr...** text box. (Figure 13) Choose the **Format...** push button.
3. In the Format dialog, choose the **Currency** check box, type 999,999,999.99 in the Format text box (Figure 14) and choose **OK**.
4. When the Report Expression dialog appears as in Figure 15, choose **OK**.
5. Repeat the steps above for the SUM\_YTDPURCH field.



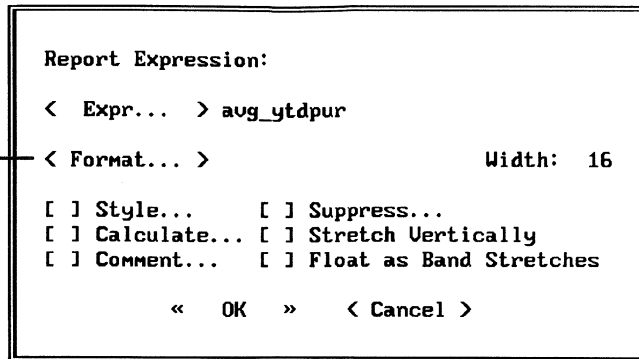


Figure 13: Report Expression Dialog

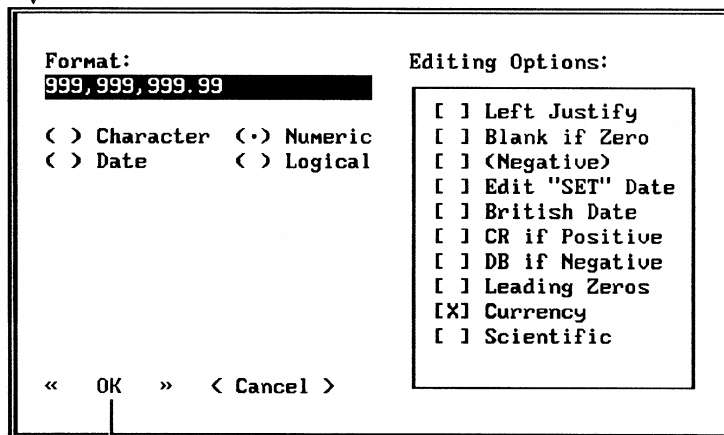


Figure 14: Format Dialog

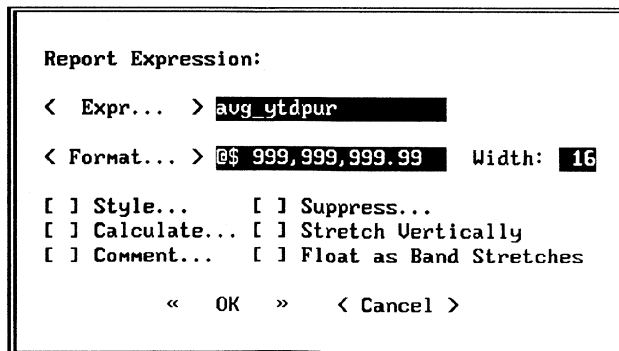


Figure 15: Report Expression Dialog

The format that you specified for these two fields has two parts:

- @\$ is entered automatically for you when you choose the **Currency** check box. This represents the floating dollar sign so that the dollar sign is printed just before the beginning of the number displayed in the field. (For example: 4536292 is displayed \$45,362.92)
- 999,999,999.99 determines how the number is displayed. Each nine shows where the digits are displayed. The period shows where the decimal point goes. The commas show where commas are placed, if the number of digits warrants their use.

This will become more clear when you see how the formatting affects the output.

Practice on a few more fields.

### **Formatting Data in a Report**

1. Choose the MIN\_YTDP field. The report form shows MIN\_YTDP because of the width of the field.
2. Choose the **Format...** push button in the Report Expression dialog.
3. Choose the **Currency** check box in the Format dialog, type 999,999.99 into the text box at the top of the dialog then choose **OK**.
4. Type 10 in the Width text box in the Report Expression dialog (Figure 16) then choose **OK**. Now the report form shows MIN\_YTDPUR because the field width has been increased.
5. Repeat the steps above for the MAX\_YTDPURCH field.

When specifying the last two formats, you needed to change the *width* of the displayed field because you added a comma to the size of the output.

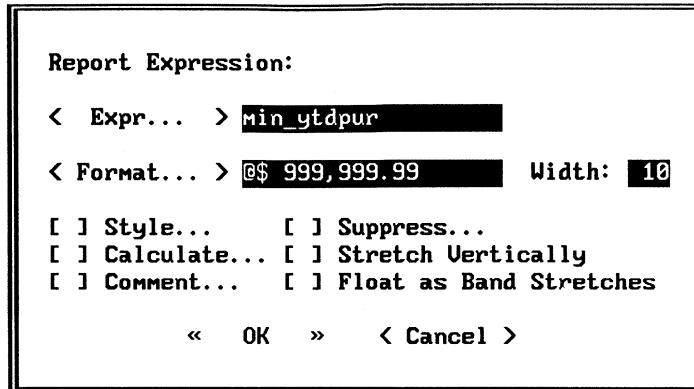


Figure 16: Report Expression Dialog

## More Reporting

Run the report and take a look at how the formatting affected the numbers.

### Generating a Report

1. Choose **RQBE - UNTITLED** from the **Window** menu popup.
2. Choose **Do Query**. The Page Preview window appears. (Figure 17)

Look at that!

05/01/91						Page 1
State	Avg	Count	Sum	Min	Max	
AK	\$14,820.12	1	\$14,820.12	\$14,820.12	\$14,820.12	
WV	\$9,558.62	2	\$19,117.23	\$4,323.57	\$14,793.66	
HI	\$7,296.10	3	\$21,888.29	\$2,982.70	\$9,829.03	
AL	\$6,271.24	2	\$12,542.48	\$2,244.58	\$10,297.90	
KY	\$5,638.50	1	\$5,638.50	\$5,638.50	\$5,638.50	
MN	\$5,276.38	6	\$31,658.29	\$1,123.43	\$11,707.61	
NM	\$5,019.53	1	\$5,019.53	\$5,019.53	\$5,019.53	
ID	\$4,399.12	1	\$4,399.12	\$4,399.12	\$4,399.12	
PA	\$4,185.73	14	\$58,600.16	\$595.46	\$11,606.18	
WA	\$4,132.30	7	\$28,926.07	\$1,210.92	\$11,433.87	
UT	\$4,033.53	6	\$24,201.20	\$1,187.86	\$12,485.77	
AZ	\$3,910.37	8	\$31,282.95	\$348.34	\$17,777.06	
LA	\$3,838.72	4	\$15,354.89	\$926.39	\$10,974.47	
CA	\$3,713.22	123	\$456,726.45	\$18.16	\$17,623.25	
OH	\$3,628.33	16	\$58,053.23	\$136.77	\$11,174.70	
NY	\$3,628.19	46	\$166,896.89	\$32.50	\$17,548.14	
<< Done >>	< More >	Column:	0			

Figure 17: Page Preview of Report 5 with Formatted Currency Fields

There are two special bands that you haven't seen yet. They are the Title and Summary bands. These optional bands are used to create a title and summary for your report.

Switch back to the report form and you'll find out how to create an end-of-report summary.

### Creating a Summary Band

1. Choose **Done** in the Page Preview window.
2. Choose **SESSION5.FRX** from the **Window** menu popup.
3. Choose **Title/Summary...** from the **Report** menu popup. The Title/Summary dialog appears.
4. Choose the **Summary Band** check box (Figure 18) then choose **OK**. A Summary band is added. (Figure 19)
5. You may want to change the size of the PgFoot band so that it's only one line wide. (Figure 19)

Report Title:

Title Band  
 New Page

Report Summary:

Summary Band  
 New Page

« OK »

< Cancel >

Figure 18: Title/Summary Dialog

Summary Band

SESSION5.FRX

R: 6 C: 6 Move Summary Page

PgHead DATEC

PgHead

State	Avg	Count	Sum	Min	Max
st	avg_ytdpur	cnt	sum_ytdpur	min_ytdpur	max_ytd

PgHead

Detail

PgFoot

Summary

Figure 19: Session 5 Report Form with Summary Band

Now that you have a Summary band, you need to decide what information to put in it.

You've already computed a total field. Now you'll place computed fields in the Summary band.

### Placing Calculated Fields in a Summary Band

1. Add an extra line to the Summary band.
2. Copy all of the fields except STATE and paste them in the appropriate spot on the bottom line of the Summary band.
3. Draw a line above the fields in the Summary band. (Figure 20)
4. Choose the AVG\_YTDPUR field in the Summary band.
5. Choose **Calculate....**
6. In the Calculate Field dialog, choose the **Average** radio button (Figure 21) then choose **OK**.
7. Choose **OK** in the Report Expression dialog.
8. Choose the CNT field and repeat steps 5-7 except choose the **Sum** radio button.
9. Choose the SUM\_YTDPUR field and repeat steps 5-7 except choose the **Sum** radio button.
10. Choose the MIN\_YTDPUR field and repeat steps 5-7 except choose the **Lowest** radio button
11. Choose the MAX\_YTDPUR field and repeat steps 5-7 except choose the **Highest** radio button.



SESSIONS.FRX

R: 0 C: 0 Move Page Header

PgHead DATE<> Page

State	Avg	Count	Sum	Min	Max
st	avg_ytdpur	cnt	sum_ytdpur	min_ytdpur	max_ytd
Summary					
	avg_ytdpur	cnt	sum_ytdpur	min_ytdpur	max_ytd

Figure 20: Session 5 Report Form with Added Summary Band and Copied Fields

Reset:

Calculate:

- Nothing
- Count
- Sum
- Average
- Lowest
- Highest
- Std. Deviation
- Variance

<< OK >>

< Cancel >

Figure 21: Calculate Field Dialog

You now have a Summary band with information calculated from the data in the Detail band. Try it and see how it looks.

**Doing the Query**

1. Choose **RQBE - UNTITLED** from the **Window** menu popup.
2. Choose **Do Query**. The Page Preview window appears.
3. Choose **More** until you reach the bottom of the report where you can see the Summary band. (Figure 22)

IA	\$1,947.91	2	\$3,895.81	\$335.37	\$3,560.44
CT	\$1,843.28	9	\$16,589.55	\$80.04	\$3,452.82
MO	\$1,785.27	8	\$14,282.17	\$133.76	\$5,297.09
UT	\$1,691.14	2	\$3,382.27	\$1,496.42	\$1,885.85
AR	\$1,688.07	1	\$1,688.07	\$1,688.07	\$1,688.07
NU	\$1,612.00	1	\$1,612.00	\$1,612.00	\$1,612.00
ME	\$1,476.57	2	\$2,953.14	\$947.43	\$2,005.71
MS	\$974.06	2	\$1,948.12	\$372.64	\$1,575.48
KS	\$956.69	3	\$2,870.07	\$247.08	\$2,074.65
RI	\$678.30	1	\$678.30	\$678.30	\$678.30
DL	\$283.93	1	\$283.93	\$283.93	\$283.93
DC	\$44.50	1	\$44.50	\$44.50	\$44.50
	<hr/>				
	\$3,337.06	500	\$1,663,206.74	\$18.16	\$17,777.06

« Done » < More > Column: 8

Figure 22: Page Preview of Report 5 Showing Summary Band

Now that you have the data right where it wants you, it's time to go to press. If you don't have a printer, choose **Done** in the Page Preview window and skip to the step box at the bottom of this page.

### **Sending the Report to the Printer**

1. Choose **Done** in the Page Preview window to return to the RQBE window. (Figure 23)
2. Choose the **Options...** check box.
3. *Uncheck* the **Preview Report/Label** check box.
4. Choose the **To Printer** check box in the Output Destinations area.
5. Choose **OK**.
6. Choose **Do Query**. The report is printed.

In a later session you will learn about commands. But just for fun take a look at the command that is behind the fantastic things you have been doing with the RQBE.

### **Looking at the SELECT Command**

Choose the **See SQL** push button – above the **Do Query** push button in the RQBE window. The See SQL window appears as in Figure 24.

One tutorialite saw this and ran around shouting, “I can do SQL! Look at my SELECT command! I can do SQL!” So don't be embarrassed if that is what you did.

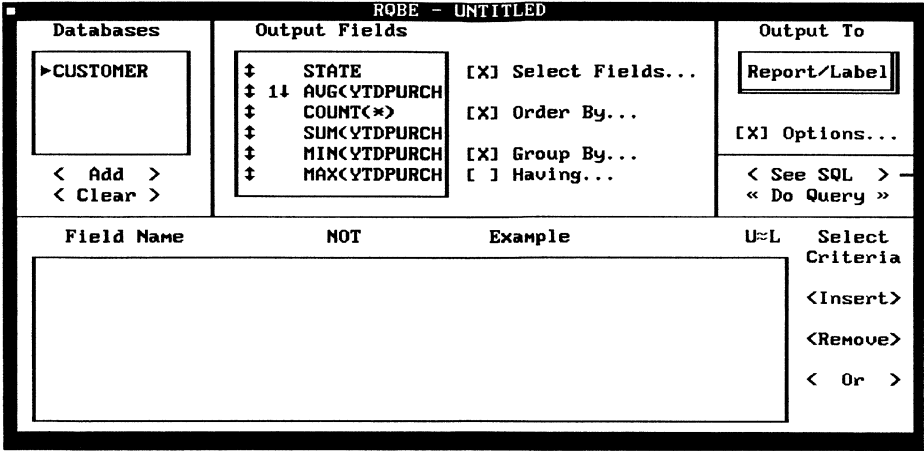


Figure 23: RQBE Window

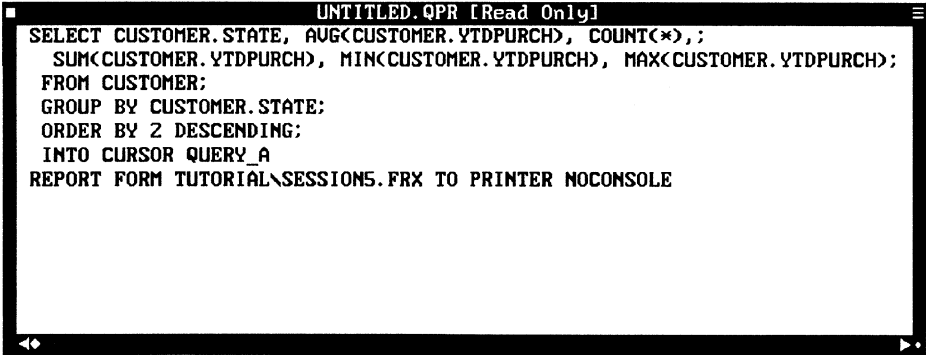


Figure 24: SELECT Command

You have worked hard and created a wonderful report. Save your creations and gloat for a short time on your success.

### **Saving the Report**

1. Close the See SQL window.
2. Choose **Save as...** from the **File** menu popup, type `Session5` in the text box then choose **Save**.
3. Close the RQBE window.
4. Close the Session 5 report form and choose **Yes** when FoxPro asks about saving changes.

# Session 6

## RQBE and the Report Writer in Action

In this session you'll see a five step example of how FoxPro's RQBE and Report Writer can be used as analytical tools.

- Sample databases . . . . . page 2
- Step 1 . . . . . page 4
- Step 2 . . . . . page 6
- Step 3 . . . . . page 8
- Step 4 . . . . . page 12
- Step 5 . . . . . page 16

## **RQBE and the Report Writer in Action**

---

In this session you'll see RQBE and the Report Writer used to perform a sales analysis. RQBE enables you to extract data from several databases and the Report Writer allows even more refined reporting.

The examples in this session use the six databases shown in Figure 1. Figure 1 also shows the fields that the six databases have in common. Common fields are used to join databases.

The CUSTOMER database can be joined to the INVOICES database by the customer number field, CNO. The INVOICES database can be joined to the DETAIL database by the invoice number field, INO. The DETAIL database can be joined to the PARTS database by the part number field, PNO. The INVOICES database can also be joined to the SALESMAN database by the SALESMAN field. The SALESMAN database can be joined to the OFFICES database by the office number field, ONO.



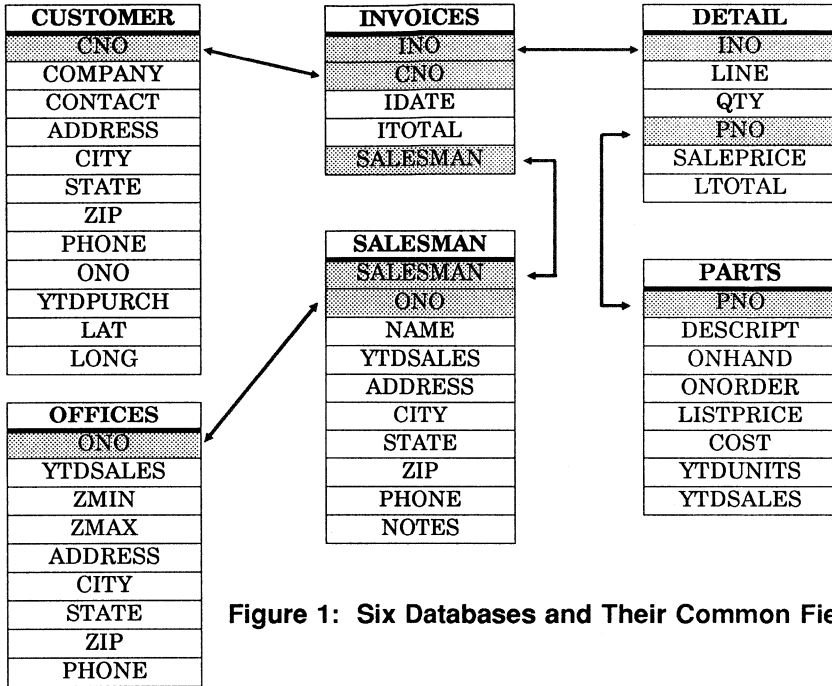


Figure 1: Six Databases and Their Common Fields

Let's begin with a query that shows the total sales for each salesman.

Note that FoxPro may ask you to locate one of the databases used in these queries. If so, simply select the database that FoxPro is requesting.

### Opening STEP1.QPR

1. Choose **Open...** from the **File** menu popup. Make sure that **Query** appears on the **Type** popup control.
2. Select STEP1.QPR and choose **Open**. The RQBE window appears as in Figure 2.

### Doing the Query

Choose **Do Query**. Query results appear in the Browse window. (Figure 3)

The total sales for each salesman are extracted from the INVOICES database. The output fields are the salesman number and the sum of the invoice totals. The results are grouped by salesman so that a total invoice amount is shown for each salesman.

### Closing Browse and RQBE

1. Close the Browse window.
2. Close the RQBE window.

**RQBE - STEP1**

<p><b>Databases</b></p> <p>► INVOICES</p> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <p>↓ SALESMAN [X] Select Fields...          ↓ SUM&lt;ITOTAL&gt; [ ] Order By...          ↓ [X] Group By...          ↓ [ ] Having...</p>	<p><b>Output To</b></p> <p>Browse</p> <p>STEP1 [ ] Options...</p> <p>&lt; See SQL &gt; « Do Query »</p>										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Field Name</th> <th style="width: 10%;">NOT</th> <th style="width: 20%;">Example</th> <th style="width: 10%;">U≈L</th> <th style="width: 10%;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="height: 100px;"> </td> </tr> </tbody> </table>		Field Name	NOT	Example	U≈L	Select Criteria						<p>&lt; Insert &gt; &lt; Remove &gt; &lt; Or &gt;</p>
Field Name	NOT	Example	U≈L	Select Criteria								

Figure 2: STEP1.QPR

**STEP1**

Salesman	Sum_itotal	
117	282.22	
150	1919.39	
175	3022.40	
180	2952.55	
240	3855.19	
271	11110.85	
281	11447.51	
294	5748.20	
322	7216.84	
328	7567.48	
353	5721.11	
360	8898.29	
366	1749.90	
391	11681.77	
410	4721.99	
423	8814.33	

Figure 3: Step1 Query Results in Browse Window

Suppose that you want to break this information down by the office in which the salesmen work. To obtain this information, you need to use the SALESMAN database. By joining the SALESMAN database with the INVOICES database, you can extract specific information about each salesman — in this case, the office number.

### Opening STEP2.QPR

1. Choose **Open...** from the **File** menu popup.
2. Open STEP2.QPR. The RQBE window appears as in Figure 4.

Besides being used to join SALESMAN and INVOICE, the office number field, ONO, has been added to the **Output Fields** list. ONO is also being used in addition to SALESMAN to group the query results.

### Doing the Query

Choose **Do Query**. The Browse window appears as in Figure 5.

### Closing the Browse Window and RQBE

1. Close the Browse window.
2. Close the RQBE window.

**ROBE - STEP2**

<p><b>Databases</b></p> <div style="border: 1px solid black; padding: 2px;">                 ▶ INVOICES                  SALESMAN             </div> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <div style="border: 1px solid black; padding: 2px;">                 ↓ ONO            [X] Select Fields...                  ↓ SALESMAN       [ ] Order By...                  ↓ SUM&lt;ITOTAL&gt;    [X] Group By...                  ↓                    [ ] Having...             </div>	<p><b>Output To</b></p> <div style="border: 1px solid black; padding: 2px; text-align: center;">                 Browse             </div> STEP2 [ ] Options... < See SQL > « Do Query »										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Field Name</th> <th style="text-align: left;">NOT</th> <th style="text-align: left;">Example</th> <th style="text-align: left;">U=L</th> <th style="text-align: left;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>↓ SALESMAN.SALESMAN</td> <td>[ ] Like</td> <td>INVOICES.SALESMAN</td> <td>[ ]</td> <td>&lt;Insert&gt; &lt;Remove&gt; &lt; Or &gt;</td> </tr> </tbody> </table>			Field Name	NOT	Example	U=L	Select Criteria	↓ SALESMAN.SALESMAN	[ ] Like	INVOICES.SALESMAN	[ ]	<Insert> <Remove> < Or >
Field Name	NOT	Example	U=L	Select Criteria								
↓ SALESMAN.SALESMAN	[ ] Like	INVOICES.SALESMAN	[ ]	<Insert> <Remove> < Or >								

Figure 4: STEP2.QPR

**STEP2**

Ono	Salesman	Sum_itotal
1	117	282.22
1	150	1919.39
1	175	3022.40
1	180	2952.55
2	240	3855.19
2	271	11110.85
2	281	11447.51
2	294	5748.20
3	322	7216.84
3	328	7567.48
3	353	5721.11
3	360	8898.29
3	366	1749.90
3	391	11681.77
4	410	4721.99
4	423	8814.33

Figure 5: STEP2 Query Results in Browse Window

In STEP3.QPR, the OFFICES database is joined to the SALESMAN database in order to extract the city where each office is located.

#### **Opening STEP3.QPR**

1. Choose **Open...** from the **File** menu popup.
2. Open STEP3.QPR. The RQBE window appears as in Figure 6.

In addition, the report STEP3.FRX is used to enhance the appearance of the output. Using a report also allows the secondary grouping of the information by the office number field, ONO. A report allows you to get many levels of group totals as well as totals for an entire report.

#### **Opening STEP3.FRX**

1. Choose **Open...** from the **File** menu popup. Make sure **Report** is showing on the **Type** popup control.
2. Select STEP3.FRX and choose **Open**. The Report Layout window appears as in Figure 7.
3. Take a few moments to examine STEP3.FRX.
4. Close STEP3.FRX.

**RQBE - STEP3**

<p><b>Databases</b></p> <div style="border: 1px solid black; padding: 2px;">             ▶ INVOICES              SALESMAN              OFFICES           </div> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <div style="border: 1px solid black; padding: 2px;">             ↓ CITY      <input checked="" type="checkbox"/> Select Fields...              ↓ ONO        <input type="checkbox"/> Order By...              ↓ SALESMAN              ↓ NAME              ↓ SUM&lt;ITOTAL&gt;    <input checked="" type="checkbox"/> Group By...              ↓                    <input type="checkbox"/> Having...           </div>	<p><b>Output To</b></p> <div style="border: 1px solid black; padding: 2px; text-align: center;">             Report/Label           </div> <p><input checked="" type="checkbox"/> Options...</p> <p>&lt; See SQL &gt; &lt;&lt; Do Query &gt;&gt;</p>																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Field Name</th> <th style="width: 15%;">NOT</th> <th style="width: 25%;">Example</th> <th style="width: 10%;">U≈L</th> <th style="width: 10%;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>↓ SALESMAN.SALESMAN</td> <td><input type="checkbox"/> Like</td> <td>INVOICES.SALESMAN</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>↓ OFFICES.ONO</td> <td><input type="checkbox"/> Like</td> <td>SALESMAN.ONO</td> <td><input type="checkbox"/></td> <td>&lt;Insert&gt;</td> </tr> <tr> <td colspan="4"></td> <td>&lt;Remove&gt;</td> </tr> <tr> <td colspan="4"></td> <td>&lt; Or &gt;</td> </tr> </tbody> </table>			Field Name	NOT	Example	U≈L	Select Criteria	↓ SALESMAN.SALESMAN	<input type="checkbox"/> Like	INVOICES.SALESMAN	<input type="checkbox"/>		↓ OFFICES.ONO	<input type="checkbox"/> Like	SALESMAN.ONO	<input type="checkbox"/>	<Insert>					<Remove>					< Or >
Field Name	NOT	Example	U≈L	Select Criteria																							
↓ SALESMAN.SALESMAN	<input type="checkbox"/> Like	INVOICES.SALESMAN	<input type="checkbox"/>																								
↓ OFFICES.ONO	<input type="checkbox"/> Like	SALESMAN.ONO	<input type="checkbox"/>	<Insert>																							
				<Remove>																							
				< Or >																							

Figure 6: STEP3.QPR

**STEP3.FRX**

R: 0 C: 0	Move	Page Header			
PgHead	Office	Salesman		Total Sales	
PgHead					
1-ono					
Detail	city	sal name		sum_itotal	
L1-ono				sum_itotal	
L1-ono					
L1-ono					
PgFoot					
PgFoot	DATE				
Summary					
Summary					
Summary		Total Sales All Offices		sum_itotal	

Figure 7: STEP3 Report in Report Layout Window

**Doing the Query**

1. Choose **Do Query**. The Page Preview window appears as in Figure 8.
2. Choose **More** to view the entire report.
3. Choose **Done** to return to the RQBE window.
4. Close the RQBE window.

Notice how the Report Writer has permitted you to:

- Change the headings to be more informative
- Provide totals for each office
- Provide a grand total for all offices
- Put spaces between office groups
- Use the box drawing facility to provide the line between the office figures and the office total



Office	Salesman	Total Sales
1 Boston	117 Janet A. McCarthy	282.22
1 Boston	150 Robert Watters	1,919.39
1 Boston	175 Doris Dupuy	3,022.40
1 Boston	180 T Staziola Tounsend	2,952.55
		<hr/>
		8,176.56
2 New York	240 John Hodge	3,855.19
2 New York	271 Howard Schneider	11,110.85
2 New York	281 Jay Kennedy	11,447.51
2 New York	294 Tom Caravello	5,748.20
		<hr/>
		32,161.75
3 Atlanta	322 E. Faulkner	7,216.84
3 Atlanta	328 Keith Sutherland	7,567.48
3 Atlanta	353 Jim Surbrook	5,721.11
3 Atlanta	360 Ned Hicks	8,898.29
« Done »	< More >	Column: 0

Figure 8: STEP3 Report in Page Preview Window

In STEP4.QPR, the CUSTOMER database joins the party so that the report can show a breakdown of data by company for each salesman.

**Opening STEP4.QPR**

1. Choose **Open...** from the **File** menu popup. Make sure **Query** appears on the **Type** popup control.
2. Select STEP4.QPR and choose **Open**. The RQBE window appears as in Figure 9.

**RQBE - STEP4**

<p><b>Databases</b></p> <div style="border: 1px solid black; padding: 2px;">             ▶ INVOICES              SALESMAN              OFFICES              CUSTOMER         </div> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <div style="border: 1px solid black; padding: 2px;">             ‡ CITY [X] Select Fields...              ‡ ONO [ ] Order By...              ‡ SALESMAN [X] Group By...              ‡ NAME [ ] Having...              ‡ COMPANY              ‡ SUM&lt;ITOTAL&gt;         </div>	<p><b>Output To</b></p> <div style="border: 1px solid black; padding: 2px; text-align: center;">             Report/Label         </div> <p>[X] Options...</p> <p>&lt; See SQL &gt; &lt;&lt; Do Query &gt;&gt;</p>																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;">Field Name</th> <th style="width: 15%;">NOT</th> <th style="width: 25%;">Example</th> <th style="width: 10%;">U=L</th> <th style="width: 15%;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>‡ SALESMAN.SALESMAN</td> <td>[ ] Like</td> <td>INVOICES.SALESMAN</td> <td>[ ]</td> <td></td> </tr> <tr> <td>‡ OFFICES.ONO</td> <td>[ ] Like</td> <td>SALESMAN.ONO</td> <td>[ ]</td> <td>&lt;Insert&gt;</td> </tr> <tr> <td>‡ CUSTOMER.CNO</td> <td>[ ] Like</td> <td>INVOICES.CNO</td> <td>[ ]</td> <td>&lt;Remove&gt;</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: center;">&lt; Or &gt;</td> </tr> </tbody> </table>			Field Name	NOT	Example	U=L	Select Criteria	‡ SALESMAN.SALESMAN	[ ] Like	INVOICES.SALESMAN	[ ]		‡ OFFICES.ONO	[ ] Like	SALESMAN.ONO	[ ]	<Insert>	‡ CUSTOMER.CNO	[ ] Like	INVOICES.CNO	[ ]	<Remove>					< Or >
Field Name	NOT	Example	U=L	Select Criteria																							
‡ SALESMAN.SALESMAN	[ ] Like	INVOICES.SALESMAN	[ ]																								
‡ OFFICES.ONO	[ ] Like	SALESMAN.ONO	[ ]	<Insert>																							
‡ CUSTOMER.CNO	[ ] Like	INVOICES.CNO	[ ]	<Remove>																							
				< Or >																							

Figure 9: STEP4.QPR

### **Opening STEP4.FRX**

1. Choose **Open...** from the **File** menu popup. Make sure **Report** is showing on the **Type** popup control.
2. Open STEP4.FRX. The Report Layout window appears as in Figure 10.
3. Examine STEP4.FRX.
4. Close STEP4.FRX to return to the RQBE window.

### **Doing STEP4.QPR**

1. Choose **Do Query**. The Page Preview window appears as in Figure 11.
2. Choose **More** to view the entire report
3. Choose **Done** to return to the RQBE window.
4. Close the RQBE window.

Notice how the **Suppress...** option clarifies the report by eliminating duplicates of cities and salesmen's names.

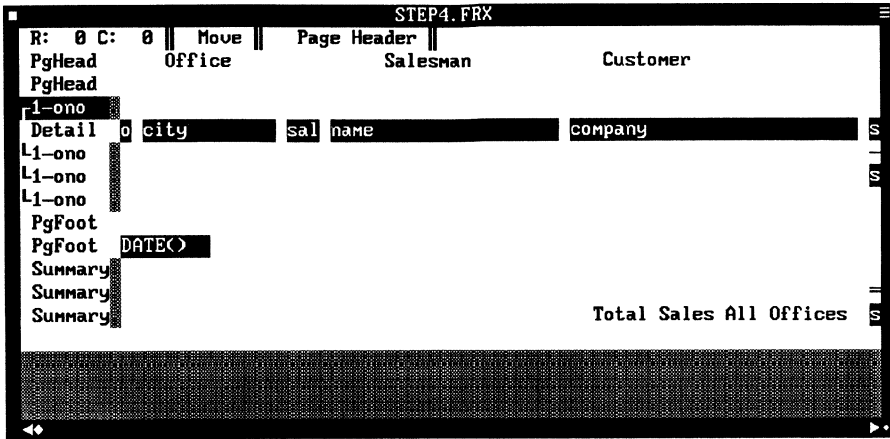


Figure 10: STEP4 Report in Report Layout Window

Office	Salesman	Customer	Total Sal
1 Boston	117 Janet A. McCarthy	Snow Aerial Realtors	282.
		Balance Computing Systems	480.
	175 Doris Dupuy	Posna Associates	441.
		Silicon Computer Calgary	996.
	180 T Staziola Townsend	Award Ammonia Greenhouses	175.
		A. Arts Computers	1,493.
		Print Mayo Consultation	1,353.
		Boehringer PCA	1,282.
		Ross & Associates Products	1,670.
2 New York	240 John Hodge	Systems Poetics and	756.
		The Circle Distributing	2,086.
	271 Howard Schneider	Wilson Solutions	1,012.
		Business State Computers	2,134.
		Bob Produce	1,557.
		Clover Office Shooters	1,590.

« Done » < More > Column: 0

Figure 11: STEP4 Report in Page Preview Window

STEP5.QPR concludes the analysis process by adding the DETAILS and PARTS databases. These databases are added to display more detailed information for each invoice.

**Opening STEP5.QPR**

1. Choose **Open...** from the **File** menu popup. Make sure **Query** is showing on the **Type** popup control.
2. Open STEP5.QPR. The RQBE window appears as in Figure 12.

**RQBE - STEP5**

<p><b>Databases</b></p> <p>▶SALESMAN OFFICES INVOICES CUSTOMER</p> <p>&lt; Add &gt; &lt; Clear &gt;</p>	<p><b>Output Fields</b></p> <p>↓ 1↑ CITY    <input checked="" type="checkbox"/> Select Fields...          ↓ 2↑ NAME    <input checked="" type="checkbox"/> Order By...          ↓ 3↑ COMPANY    <input type="checkbox"/> Group By...          ↓ 4↑ INO    <input type="checkbox"/> Having...          ↓ 5↑ DESCRIPT</p>	<p><b>Output To</b></p> <p>Report/Label</p> <p><input checked="" type="checkbox"/> Options...</p> <p>&lt; See SQL &gt; « Do Query »</p>																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Field Name</th> <th style="text-align: left;">NOT</th> <th style="text-align: left;">Example</th> <th style="text-align: left;">U&amp;L</th> <th style="text-align: left;">Select Criteria</th> </tr> </thead> <tbody> <tr> <td>↓ OFFICES.ONO</td> <td><input type="checkbox"/> Like</td> <td>SALESMAN.ONO</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>↓ INVOICES.SALESMAN</td> <td><input type="checkbox"/> Like</td> <td>SALESMAN.SALESMAN</td> <td><input type="checkbox"/></td> <td>&lt;Insert&gt;</td> </tr> <tr> <td>↓ CUSTOMER.CNO</td> <td><input type="checkbox"/> Like</td> <td>INVOICES.CNO</td> <td><input type="checkbox"/></td> <td>&lt;Remove&gt;</td> </tr> <tr> <td>↓ DETAIL.INO</td> <td><input type="checkbox"/> Like</td> <td>INVOICES.INO</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>↓ PARTS.PNO</td> <td><input type="checkbox"/> Like</td> <td>DETAIL.PNO</td> <td><input type="checkbox"/></td> <td>&lt; Or &gt;</td> </tr> </tbody> </table>			Field Name	NOT	Example	U&L	Select Criteria	↓ OFFICES.ONO	<input type="checkbox"/> Like	SALESMAN.ONO	<input type="checkbox"/>		↓ INVOICES.SALESMAN	<input type="checkbox"/> Like	SALESMAN.SALESMAN	<input type="checkbox"/>	<Insert>	↓ CUSTOMER.CNO	<input type="checkbox"/> Like	INVOICES.CNO	<input type="checkbox"/>	<Remove>	↓ DETAIL.INO	<input type="checkbox"/> Like	INVOICES.INO	<input type="checkbox"/>		↓ PARTS.PNO	<input type="checkbox"/> Like	DETAIL.PNO	<input type="checkbox"/>	< Or >
Field Name	NOT	Example	U&L	Select Criteria																												
↓ OFFICES.ONO	<input type="checkbox"/> Like	SALESMAN.ONO	<input type="checkbox"/>																													
↓ INVOICES.SALESMAN	<input type="checkbox"/> Like	SALESMAN.SALESMAN	<input type="checkbox"/>	<Insert>																												
↓ CUSTOMER.CNO	<input type="checkbox"/> Like	INVOICES.CNO	<input type="checkbox"/>	<Remove>																												
↓ DETAIL.INO	<input type="checkbox"/> Like	INVOICES.INO	<input type="checkbox"/>																													
↓ PARTS.PNO	<input type="checkbox"/> Like	DETAIL.PNO	<input type="checkbox"/>	< Or >																												

Figure 12: STEP5.QPR

### Opening STEP5.FRX

1. Choose **Open...** from the **File** menu popup. Make sure **Report** is showing on the **Type** popup control.
2. Open STEP5.FRX. The Report Layout window appears as in Figure 13.
3. Examine STEP5.FRX.
4. Close STEP5.FRX.

### Doing the Query

1. Choose **Do Query**. The Page Preview window appears as in Figure 14.
2. Choose **More** to view the entire report.
3. Choose **Done** to return to the RQBE window.

The final result is a report that organizes the information by sales office. Within each sales office, the information is broken down by salesman. For each salesman, the information is broken down by company. For each company, the information is broken down by invoice. For each invoice, information is given on the parts contained in that invoice.

The report also lists overall totals as well as totals by invoice, company, and salesman.

Notice how boxes can be used to further clarify the data being presented in the report.

This should give you an idea about how to use RQBE and the Report Writer to analyze your data and quickly extract the data that you want to see.



STEPS.FRX

R: 0 C: 0 || Move || Page Header ||

PgHead

r1-city SALES OFFICE: city

Office	Company Name	Inv#	Item Description	Qty
SALES ACTIVITY FOR name				
city	company	ino	descript	qty
TOTAL FOR company				qty

Figure 13: STEP5 Report in Report Layout Window

SALES OFFICE: Atlanta

Office	Company Name	Inv#	Item Description	Qty	Price
SALES ACTIVITY FOR E. Faulkner					
Atlanta	First Computer	1142	Cursive irishman	4	34.
			Defeat confocal	5	11.
			Holst rash	6	8.
			Runty riordan	2	122.
			Skimpy ampex	4	29.
			Soiree intuit	2	11.
			Suit bead corvus	1	130.
			Sulfate images	1	27.
			Woodyard lizard	1	98.

<< Done >> < More > Column: 0

Figure 14: STEP5 Report in Page Preview Window



## Working With Your Own Database

In this session you'll learn to create your own database and add, delete and modify records.

- Creating a database structure . . . . page 2
- Defining a database structure . . . . page 4
- Entering data in a database . . . . . page 6
- Modifying a database structure . . . page 10
- Marking records for deletion . . . . page 16
- Packing a database . . . . . page 20

## Working With Your Own Database

---

So far, you've been using databases that we've provided. Now, it's time to create and manipulate your own database.

The first step in creating a database is to decide what information you want to store in the database. Suppose you want to keep track of information about wine. You must decide what information about your wines that you want to save.

You decide that winery, type, flavor, origin, date of purchase, date of corking, cost and present value are important. Each of these pieces of information will be one field in your database. You may also want a field for some other comments about your wine.

Go ahead and start building a database called CELLAR.

### Creating a Database Structure

1. Choose **New...** from the **File** menu popup. The New File dialog appears. (Figure 1)
2. The **Database** radio button is chosen by default, so choose **OK**. The Structure dialog appears. (Figure 2)

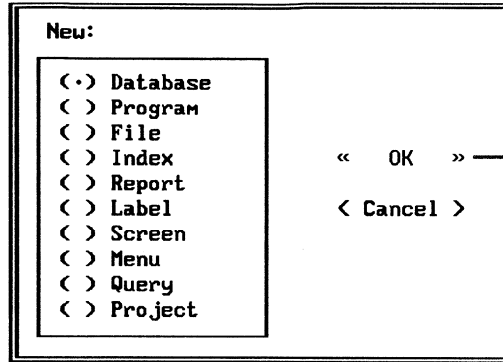


Figure 1: New File Dialog

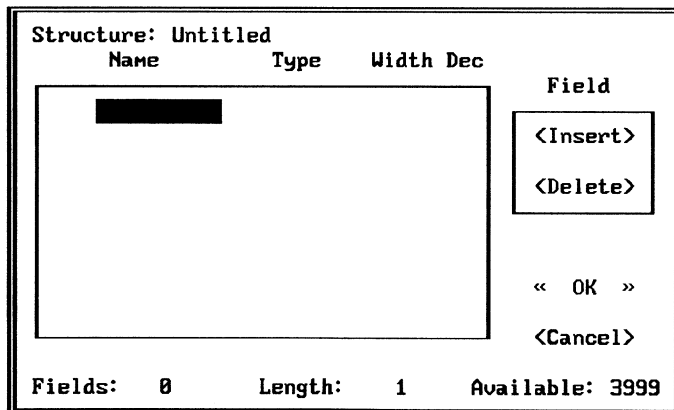


Figure 2: Structure Dialog

The cursor appears in the Name field. Now you can add the name, type and width of each of the fields shown in Figure 3. For more information on field types, see the *FoxPro Interface Guide*.

As you define your fields, the Structure dialog's status line displays how many fields you have defined, the total length of all defined fields and how much space is still available for more field definitions.

### Defining a Database Structure

1. Type `Winery` in the Name field; **Character** appears on the **Type** popup by default; type `20` in the Width field; skip the Dec field.
2. Using Figure 3 as a guide, define the remaining fields.
3. When the Structure dialog appears as in Figure 3, choose **OK**. The Save As dialog appears.

### Naming a Database and Preparing to Add Records

1. Type `CELLAR` in the Save As dialog text box (Figure 4) then choose **Save**.
2. FoxPro asks if you want to input records now (Figure 5). Choose **Yes**.

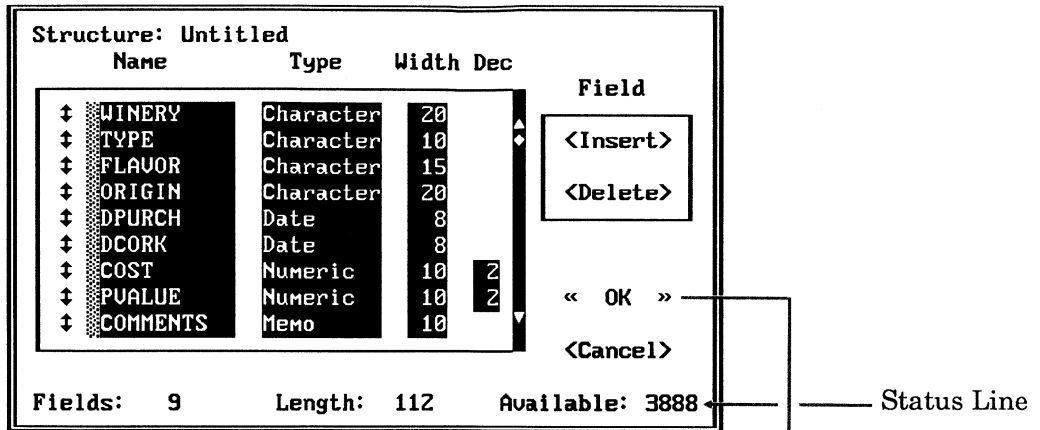


Figure 3: Structure Dialog with Field Information

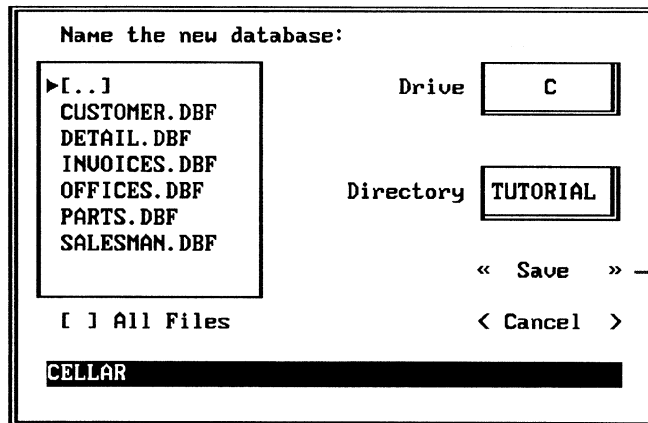


Figure 4: Save As Dialog

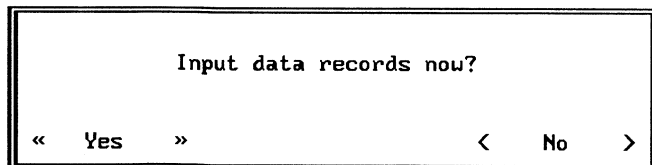


Figure 5: Input Records Alert

A Browse window appears, in Change mode, with the cursor in the first field of the first record. In Figures 6 and 7, the COMMENTS memo field has been opened, resized and moved to the location shown.

Go ahead and add the following information.

### **Entering Data in a Database Structure**

1. Type Mogen David and press Enter.
2. Type Generic and press Enter.
3. Type Concord and press Enter.
4. Type ? and press Enter.
5. Type 02 12 91. You do not need to type the /. The cursor moves to the next field automatically.
6. Press Enter to skip the DCORK field.
7. Type 3.59. The cursor moves to the next field.
8. Type 3.59. The cursor moves to the next field.
9. Open the memo window by pressing Ctrl+PgDown or double-clicking with the mouse. Type This was a gift from Bert. Close the memo window.
10. Press Enter to position the cursor in the first field of the second record.
11. Using Figure 7 as a guide, add the following information to the next record: MD 20/20, Generic, Grape, ?, 03 23 91, skip the DCORK field, 3.25, 3.25, This was a gift from Ernie. Close the memo window.
12. Figures 6 and 7 show how the Browse windows and associated memo windows appear after you add information. We've rearranged the windows on the screen so they appear side by side.
13. Close the Browse window.



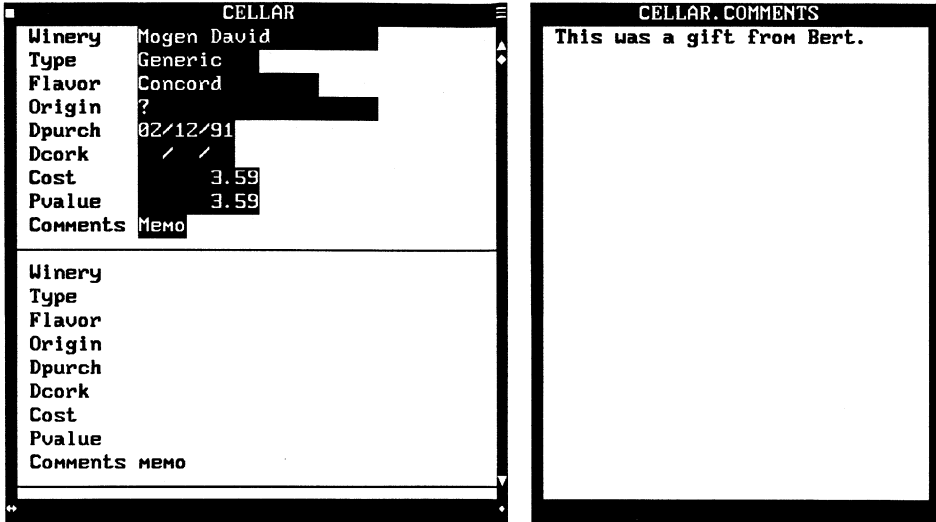


Figure 6: CELLAR.DBF

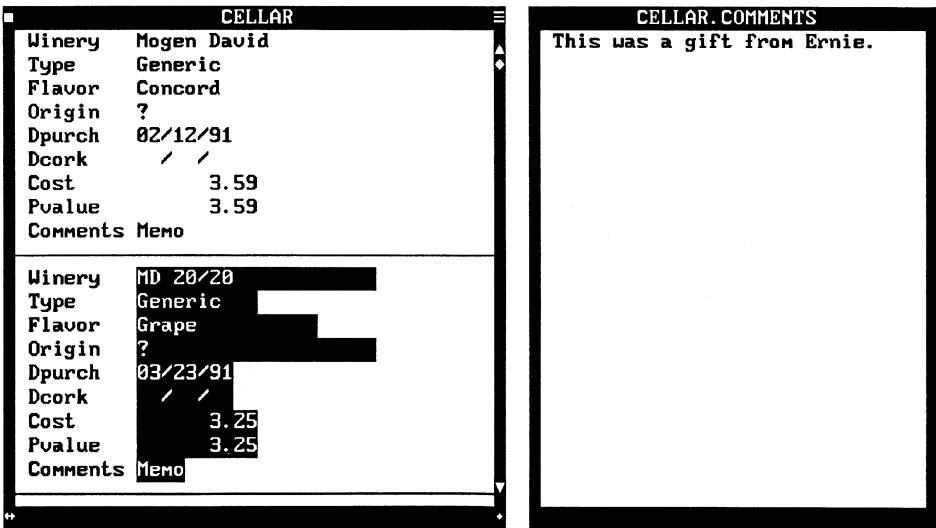


Figure 7: CELLAR.DBF

You have just added records to your database during the creation process. You can also append records to a database that already exists through the **Record** menu popup.

### **Adding Records to a Database**

1. Choose **Append** from the **Record** menu popup. The Browse window appears in Append mode.
2. Using Figure 8 as a guide, add the following data to **record three**: Boone's, Generic, Wild Mountain, California, 03/24/91, **skip the DCORK field**, 2.39, 2.39, Present from Mom and Dad.
3. Using Figure 9 as a guide, add the following data to **record four**: Barton & Guestier, Chablis, White, France, 08/22/89, 01/01/87, 11.36, 17.95, My first real investment.

Figures 8 and 9 show how information in your Browse window and associated memo windows appear.

CELLAR		CELLAR.COMMENTS
Winery	Boone's	Present from Mom and Dad.
Type	Generic	
Flavor	Wild Mountain	
Origin	California	
Dpurch	03/24/91	
Dcork	/ /	
Cost	2.39	
Pvalue	2.39	
Comments	Memo	
Winery		
Type		
Flavor		
Origin		
Dpurch		
Dcork		
Cost		
Pvalue		
Comments	MEMO	

Figure 8: CELLAR.DBF

CELLAR		CELLAR.COMMENTS
Winery	Boone's	My first real investment.
Type	Generic	
Flavor	Wild Mountain	
Origin	California	
Dpurch	03/24/91	
Dcork	/ /	
Cost	2.39	
Pvalue	2.39	
Comments	Memo	
Winery	Barton & Guestier	
Type	Chablis	
Flavor	White	
Origin	France	
Dpurch	03/22/89	
Dcork	01/01/87	
Cost	11.36	
Pvalue	17.95	
Comments	Memo	

Figure 9: CELLAR.DBF

FoxPro gives you the flexibility to change the structure of your database as your needs change. Suppose that you want to use this database not only for wines that you are collecting but also for wines that you have tasted.

To do this, you need to add a consumption date and a rating field. Because you've learned at a recent wine-tasting that wines are categorized by class, not flavor, you also decide to change the FLAVOR field to CLASS.

Let's make these modifications.

### Modifying a Database Structure

1. Close the Browse window.
2. Choose **Setup...** from the **Database** menu popup. The Setup dialog appears as in Figure 10.
3. Choose the **Modify** push button in the *upper left corner* of the Setup dialog. The Structure dialog appears.
4. Position the cursor on the FLAVOR field and change it to CLASS as shown in Figure 11.
5. Position the cursor on the COST field and choose the **Insert** push button. NEWFIELD appears above the COST field. (Figure 11) Change NEWFIELD to DCONSUM, then choose **Date** from the **Type** popup.
6. Position the cursor on COST and choose **Insert**. Change NEWFIELD to RATING, choose **Numeric** from the **Type** popup then change the Width field to 1.

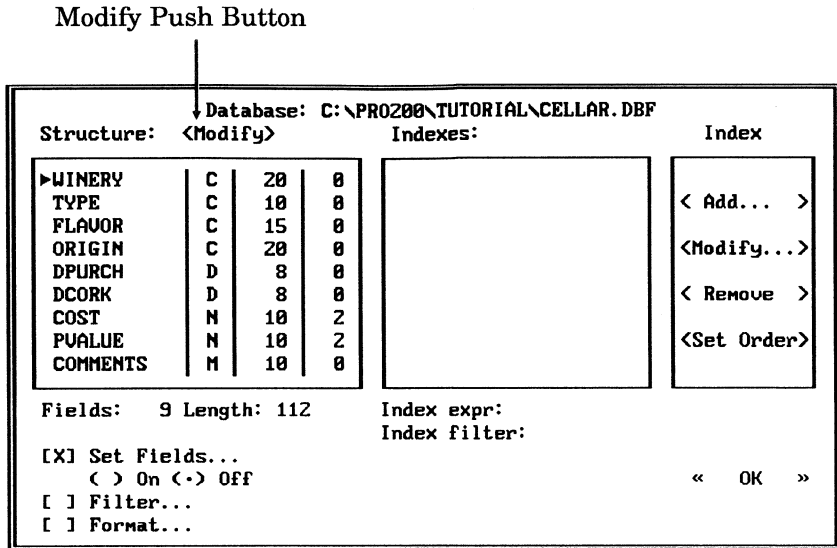


Figure 10: Setup Dialog with CELLAR.DBF Information

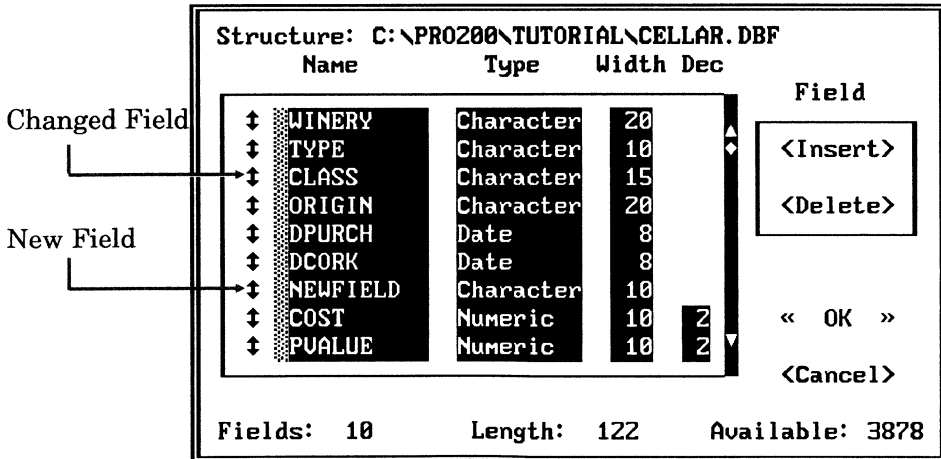


Figure 11: Structure Dialog Showing Changes to CELLAR.DBF

Now you have a database that meets your needs. If not, you can easily change it.

**Making Database Structure Changes Permanent**

1. When the Structure dialog appears as in Figure 12, choose **OK**.
2. FoxPro asks if you want to make the structure changes permanent. (Figure 13) Choose **Yes**.
3. The Setup dialog now reflects the changes you've made. (Figure 14)

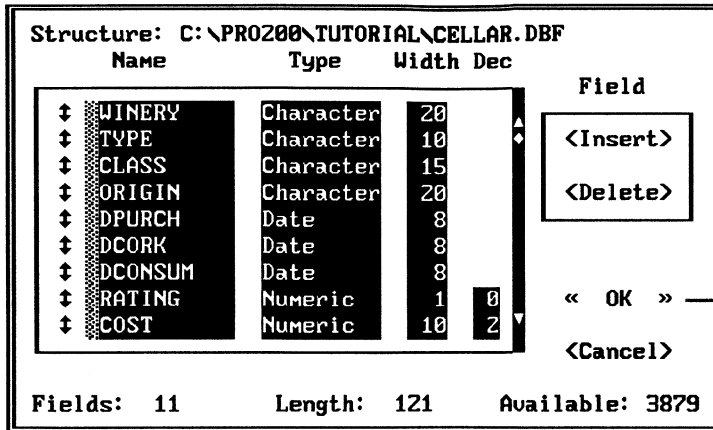


Figure 12: Structure Dialog with Changes

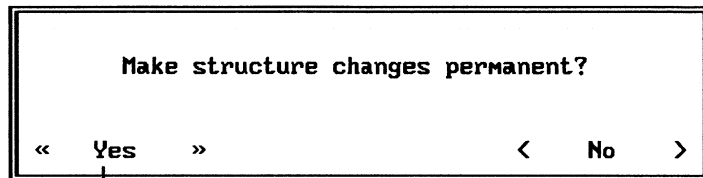


Figure 13: Structure Changes Alert

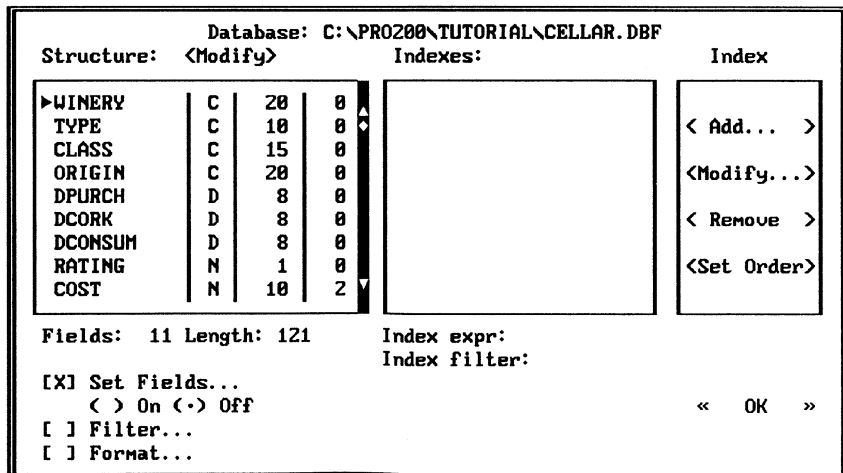


Figure 14: Setup Dialog with Changes

You've seen that adding records is a simple matter of typing in data while in Append mode. Deleting records is just as easy. First, browse the database in question.

**Browsing CELLAR.DBF**

1. Choose **OK** to exit the Setup dialog.
2. Choose **Browse** from the **Database** menu popup. An alert appears (Figure 15) to tell you that the default browse setup will be used. This is because you have changed the structure of the database since the last time you browsed the database. Your next keystroke will remove the alert from your screen.
3. Size the Browse window so it stretches across your screen as shown in Figure 16.

Notice the column between the fields and the window border. (Figure 16) A dot ( • ) appears in this delete/recall column when you mark the record for deletion.



Invalid BROWSE setup -- default setup used

Figure 15: Default Browse Setup Alert

Delete/Recall Column

CELLAR				
Winery	Type	Class	Origin	Dpurc
Mogen David	Generic	Concord	?	02/12/
MD 20/20	Generic	Grape	?	03/23/
Boone's	Generic	Wild Mountain	California	03/24/
Barton & Guestier	Chablis	White	France	08/22/

Figure 16: CELLAR.DBF Showing Delete/Recall Column

Go ahead and mark a couple of records for deletion.

### Marking Records for Deletion

With the keyboard:

1. Use the Up and Down Arrows to select the record with the name "MD 20/20."
2. Choose **Toggle Delete** from the **Browse** menu popup. A dot appears in the delete/recall column. (Figure 17)
3. Repeat steps 1 and 2 but mark "Boone's" for deletion.

With the mouse:

1. Position the pointer on the delete/recall column next to "MD 20/20" and click. A dot appears in the column. (Figure 17)
2. Repeat the step above but mark "Boone's" for deletion.

These records are only *marked* for deletion. They have not yet been deleted. FoxPro is waiting for you to give the word to delete these records. That word is *pack*.

Packing a database permanently removes all of the marked records. This process is irreversible, so you must be very sure that only those records that you really, really want to get rid of are marked for deletion.

CELLAR				
Winery	Type	Class	Origin	Dpurc
Mogen David	Generic	Concord	?	02/12/
•MD 20/20	Generic	Grape	?	03/23/
•Boone's	Generic	Wild Mountain	California	03/24/
Barton & Guestier	Chablis	White	France	08/22/

Figure 17: CELLAR.DBF with Records Marked for Deletion

Two records marked for deletion

Suppose you change your mind about deleting one of the records you have marked. Let's go in and unmark it.

### **Recalling a Record Marked for Deletion**

With the keyboard:

1. Press the Up and Down Arrows to select the record with the winery name "Boone's."
2. Choose **Toggle Delete** from the **Browse** menu popup. The dot in the delete/recall column disappears. (Figure 18)

With the mouse:

Position the pointer on the dot next to "Boone's" in the delete/recall column and click. The dot disappears. (Figure 18)

CELLAR				
Winery	Type	Class	Origin	Dpurc
Mogen David	Generic	Concord	?	02/12/
• MD 20/20	Generic	Grape	?	03/23/
Boone's	Generic	Wild Mountain	California	03/24/
Barton & Guestier	Chablis	White	France	08/22/

Figure 18: CELLAR.DBF with One Record Marked for Deletion

Now it's time to impose the sentence on the record marked for deletion.

**Packing the Database**

1. Choose **Pack** from the **Database** menu popup. An alert appears asking if you want to pack the database. (Figure 19)
2. Choose **Yes**.

Verify that the record marked for deletion is indeed gone.

**Browsing the Database**

1. Choose **Browse** from the **Database** menu popup.
2. Look high and low for the record — “MD 20/20” is gone. (Figure 20)

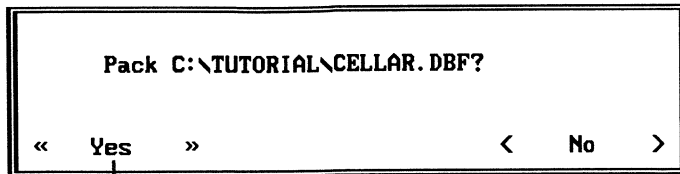


Figure 19: Pack Alert

CELLAR				
Winery	Type	Class	Origin	Dpurc
Mogen David	Generic	Concord	?	02/12/
Boone's	Generic	Wild Mountain	California	03/24/
Barton & Guestier	Chablis	White	France	08/22/

Figure 20: CELLAR.DBF Packed

Editing the data in your database is easy, too.

**Editing Data in the Database**

Position the cursor after “Concord” in the CLASS field of the first record and add “Grape” so the record appears as in Figure 21.

You’ve accomplished many tasks during this session that in the past could only have been accomplished by techno-whizzes.

Please take some time and enjoy the intermission while we rearrange the props.



Field changed from Concord to Concord Grape

The screenshot shows a database table titled "CELLAR" with the following data:

Winery	Type	Class	Origin	Dpur
Mogen David	Generic	Concord Grape	?	02/12
Boone's	Generic	Wild Mountain	California	03/24
Barton & Guestier	Chablis	White	France	08/22

Figure 21: CELLAR.DBF with Edited Field



## Designing a Custom Input Screen

In this session you'll learn to use FoxPro's powerful Screen Builder to design your own custom input screen.

- Creating a quick screen . . . . . page 2
- Placing fields in a user window . . . page 4
- Creating a scrollable list . . . . . page 12
- Generating screen code . . . . . page 14
- Creating a calculated field . . . . . page 20
- Creating a popup . . . . . page 24
- Adding a control panel . . . . . page 26
- Creating a screen set . . . . . page 26

## Designing a Custom Input Screen

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So far, you've looked at data in several ways. You've used the Browse window to view data in tabular form. Change mode allowed you to look at fields in each record one below the other. With reports, you placed data exactly where you wanted it for display and printing purposes.

The Screen Builder lets you include your data in a screen that you design — not only for display but for input and modification as well. In this session you'll create and use a screen for your CELLAR database.

Let's begin by creating a quick screen.

### Creating a Quick Screen

1. Make sure CELLAR.DBF is open.
2. Choose **New...** from the **File** menu popup, choose the **Screen** radio button then choose **OK**. An untitled Screen Design window appears. (Figure 1)
3. Choose **Quick Screen...** from the **Screen** menu popup. The Quick Screen dialog appears. (Figure 2)
4. Choose **OK** in the Quick Screen dialog. The fields from CELLAR.DBF are placed in the Screen Design window. (Figure 3)

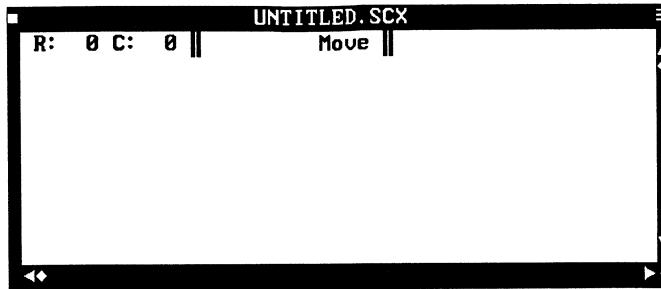


Figure 1: Screen Design Window

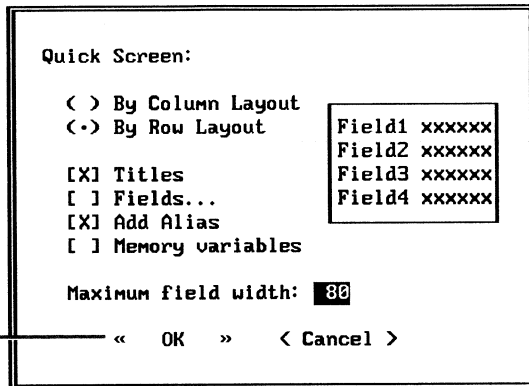


Figure 2: Quick Screen Dialog

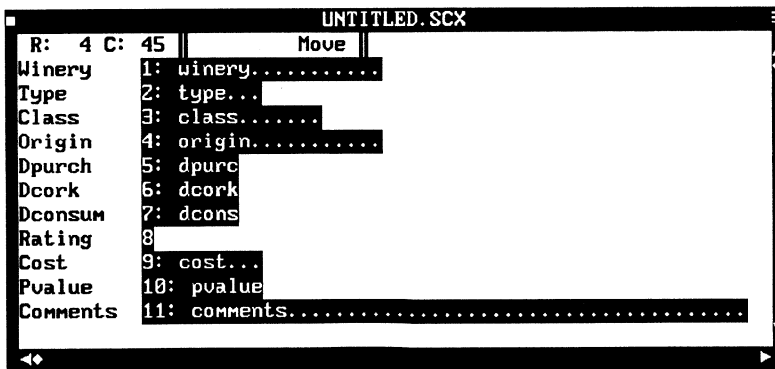


Figure 3: Screen Design Window with CELLAR.DBF Fields

With the Screen Builder, you can place fields in a window that you design.

### Placing Fields in a User Window

1. Choose **Screen Layout...** from the **Screen** menu popup. The Screen Layout dialog appears.
2. Choose the **Window** radio button at the top of the Screen Layout dialog. (Figure 4)
3. Type Wineing Is My Hobby in the Title text box. (Figure 4)
4. Type 15 in the Height text box and 64 in the Width text box. (Figure 4)
5. Choose the **Type...** push button. The Window Type dialog appears as in Figure 5.
6. Choose **Dialog** from the **Type** popup then choose **OK**.

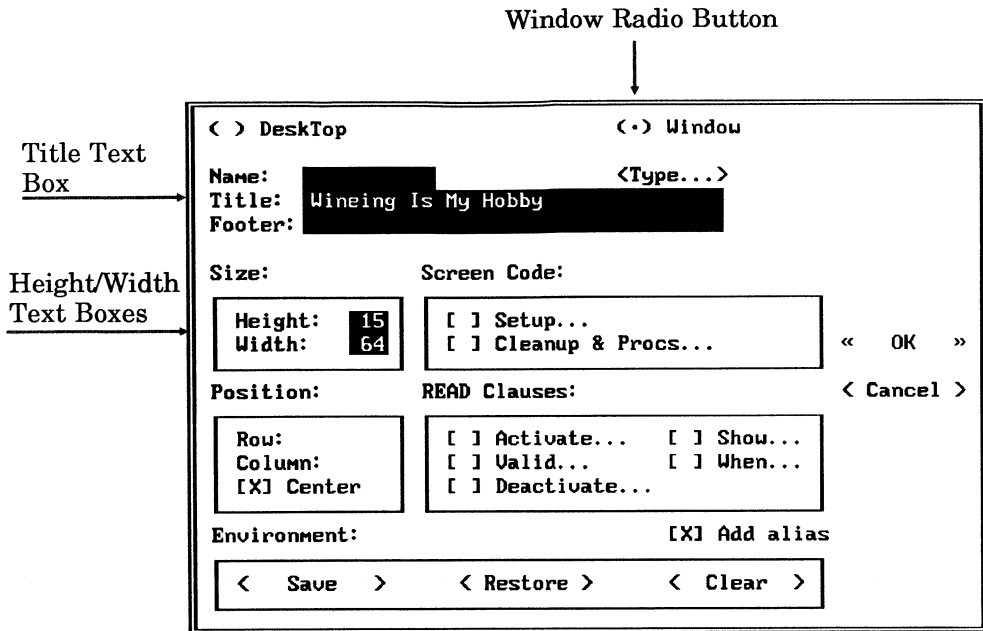


Figure 4: Screen Layout Dialog

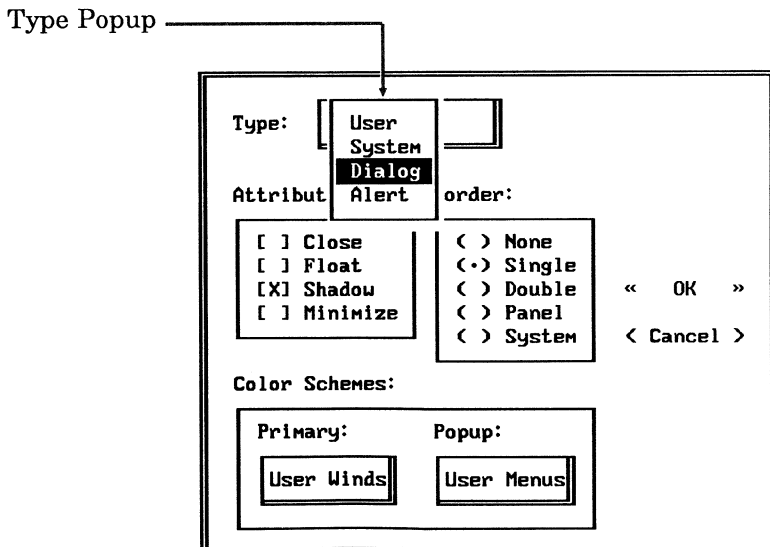


Figure 5: Window Type Dialog

### **Returning to the Screen Design Window**

Choose **OK** in the Screen Layout dialog. The Screen Design window appears as in Figure 6.

Now you can move the fields and field titles around so that they are pleasing to your eye. Figure 7 shows one possible outcome.

### **Moving Fields and Field Titles**

Move the fields and field titles to match Figure 7.

- With the keyboard, move the cursor to each field and field title, press the Spacebar then use the arrow keys to move the field or field title to the desired location. Press Enter to confirm the move.
- With the mouse, click on each field and field title and drag it to the desired location.



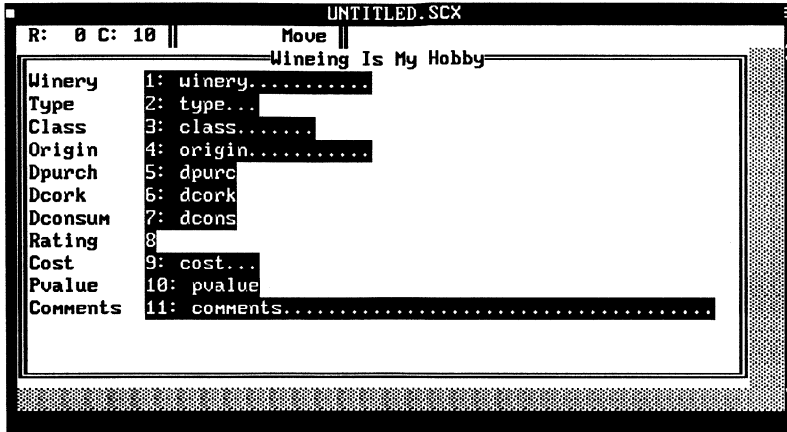


Figure 6: Screen Design Window

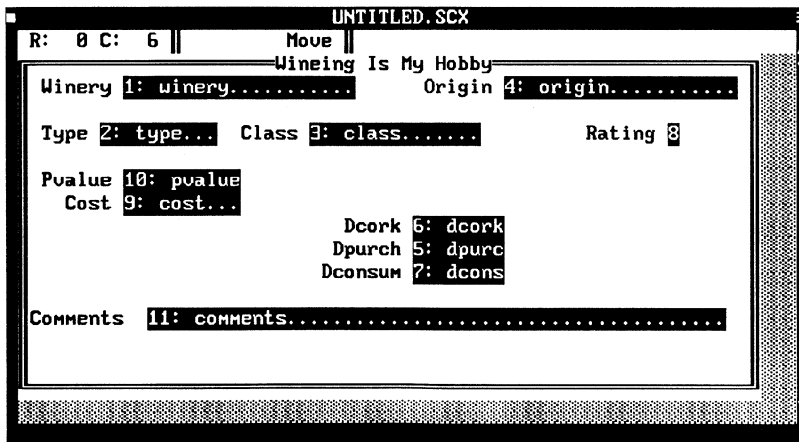


Figure 7: Screen Design Window with Moved Fields and Field Titles

It might look nicer if a few of the field titles were changed.

### **Editing Field Titles**

1. Edit the following field titles to match Figure 8: Change DPURCH to PURCHASED, DCORK to CORKED, DCONSUM to CONSUMED and PVALUE to VALUE.

To edit a title, select the field title and choose **Text** from the **Screen** menu popup. Type the desired title. Press Enter when you're finished editing each title.

2. Using Figure 8 as a guide, position the cursor where you want the text "Date" to appear, type Date then press Enter.

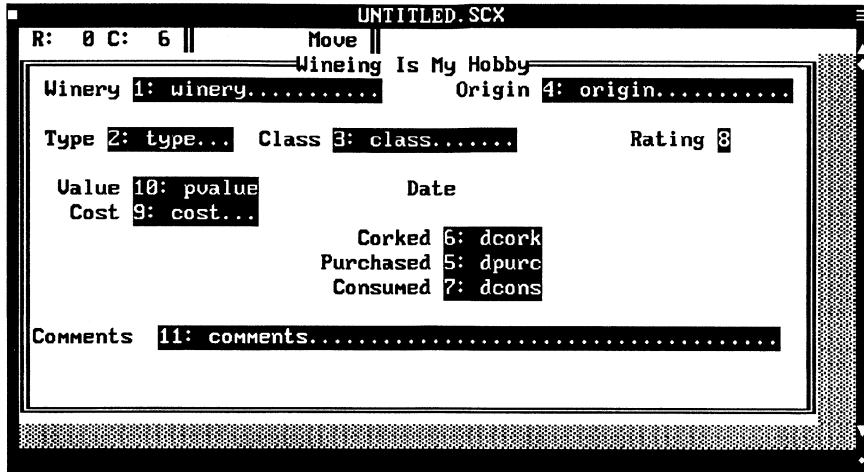


Figure 8: Screen Design Window with Edited Field Titles

Try drawing a line beneath “Date.”

### **Drawing a Line**

Add a line beneath “Date,” as shown in Figure 9, by positioning the cursor in the location you want the line to appear and choosing **Box** from the **Screen** menu popup.

- With the keyboard, use the arrow keys to shrink the blinking box to a line then press the Right Arrow key until the line is the desired length. Press Enter to confirm the action.
- With the mouse, click on the blinking box and drag until the line has no depth and is the desired length then release the mouse button.

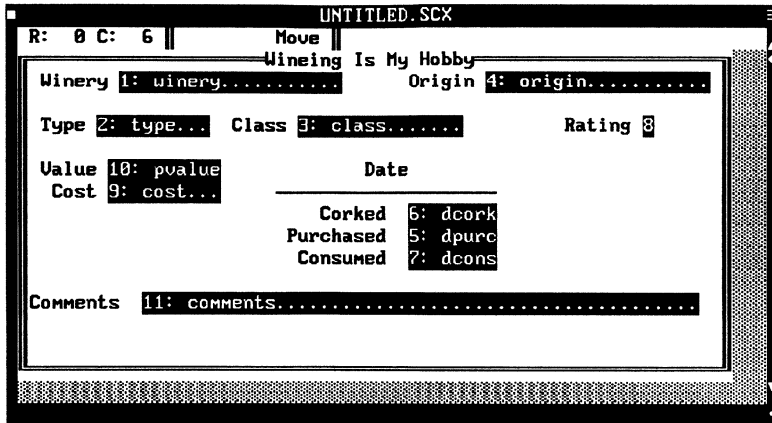


Figure 9: Screen Design Window with Line

The COMMENTS field is a memo field and can contain a variable amount of information. Let's change how this field is displayed to reflect its unique structure.

### Changing the Display of the Memo Field

1. Choose the COMMENTS field. The Screen Field dialog appears.
2. Choose the **Edit** radio button at the top of the Screen Field dialog and choose the **Scroll bar** check box. The dialog should appear as in Figure 10. Choose **OK**.
3. Size the COMMENTS field to match Figure 11.
  - With the keyboard, Ctrl+Spacebar on the field so that it blinks. Use the arrow keys to size the field then press Enter.
  - With the mouse, Ctrl+click on the field so that it blinks. Hold down the mouse button then drag until the field is the desired size.

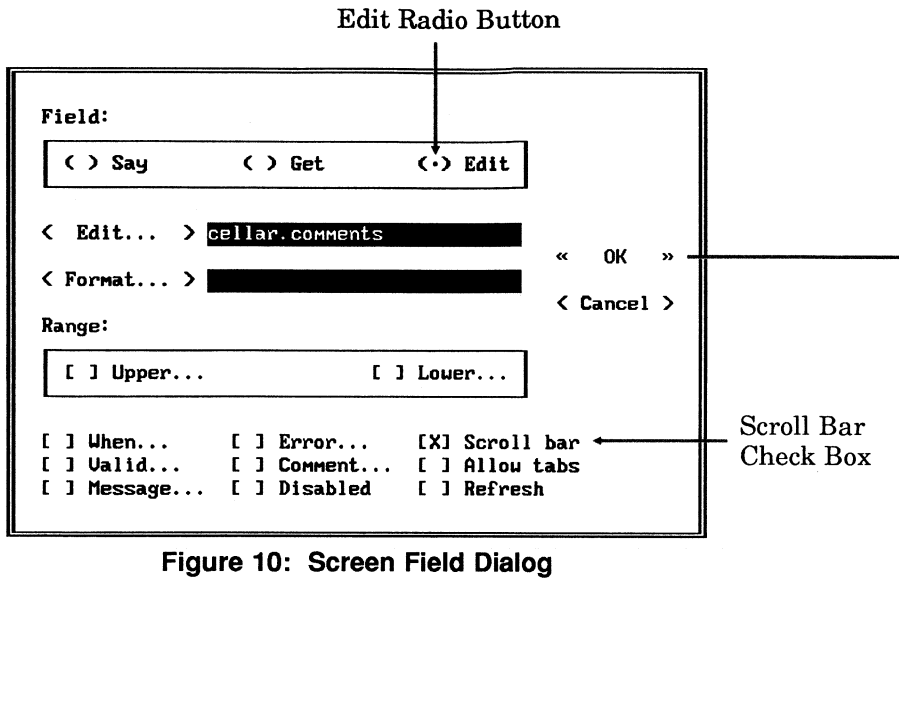


Figure 10: Screen Field Dialog

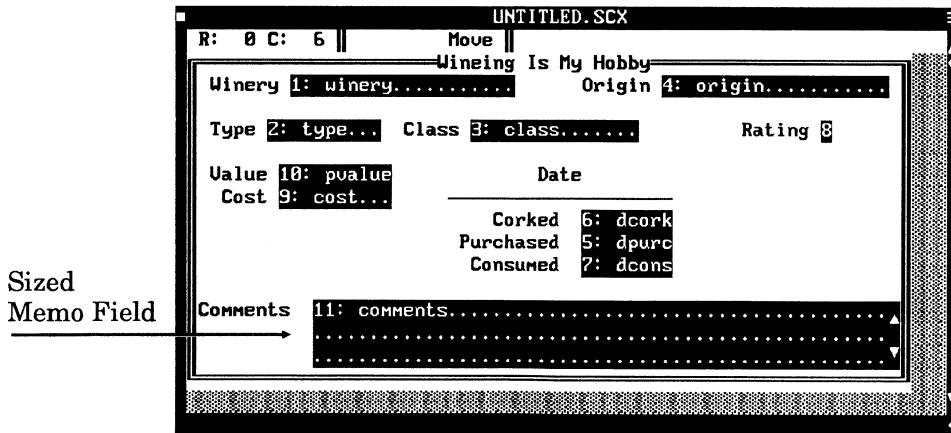


Figure 11: Screen Design Window with Sized Memo Field

To use this screen, you need to tell FoxPro to generate a program. Don't worry about the whys and hows of programs right now — you will learn about those in a little while. As your screen is generated, you will see a *thermometer* that indicates the progress of the generation.

Go ahead and generate your first screen.

### **Generating Screen Code**

1. Choose **Generate...** from the **Program** menu popup. FoxPro asks if you want to save changes to your untitled screen. Choose **Yes**.
2. In the Save As dialog, type `CELLAR` as shown in Figure 12 then choose **Save**.
3. FoxPro asks if you want to save environment information. Choose **Yes**.
4. The Generate dialog appears as in Figure 13. Choose **Generate**.



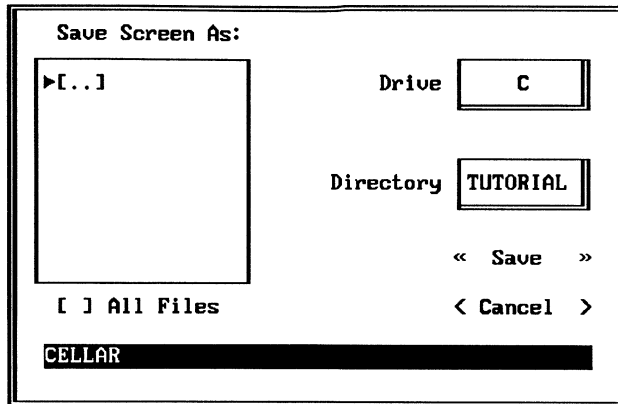


Figure 12: Save As Dialog

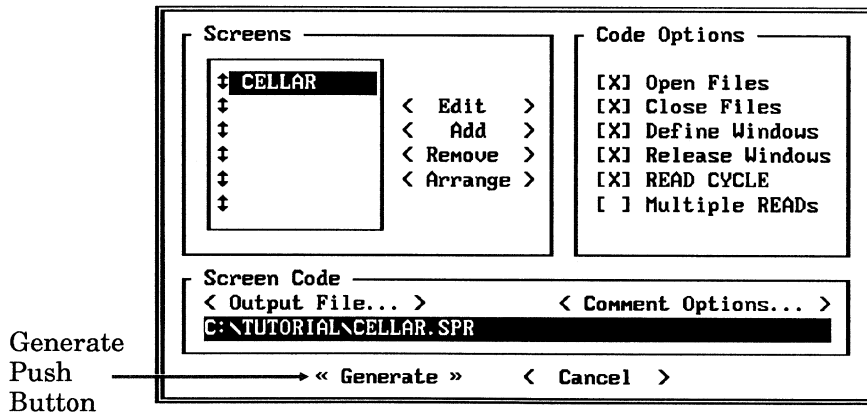


Figure 13: Generate Dialog

To see the results of your screen, close the Screen Design window and do the program CELLAR.SPR.

### **Doing CELLAR.SPR**

1. Close CELLAR.SCX.
2. Choose **Do...** from the **Program** menu popup. The Do dialog appears. (Figure 14)
3. Select CELLAR.SPR and choose **Do**.

Figure 15 shows the screen you designed. The screen contains information from the current record in CELLAR.DBF.

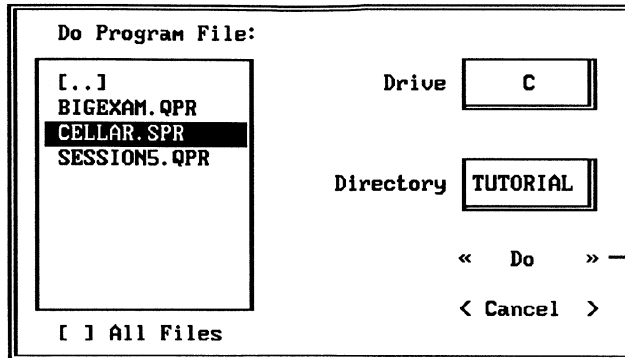


Figure 14: Do Dialog

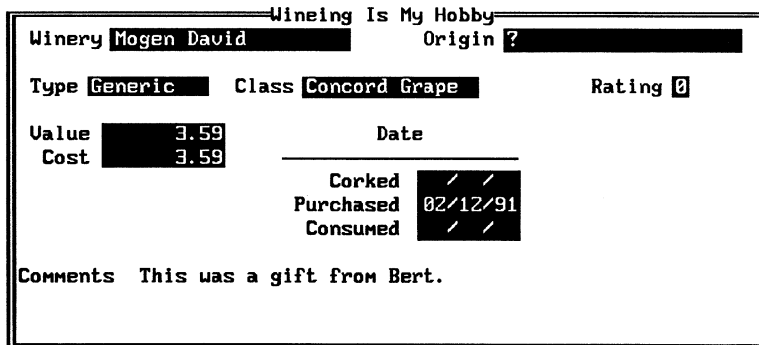


Figure 15: Screen with Fields from CELLAR.DBF

As it stands, you can only use the screen to look at one record. Let's modify the screen so that it is more flexible.

### **Opening an Existing Screen**

1. Press Escape to remove the screen from your monitor.
2. Choose **Open...** from the **File** menu popup and make sure **Screen** is showing on the **Type** popup control.
3. Select CELLAR.SCX then choose **Open**. CELLAR.SCX appears as in Figure 16.

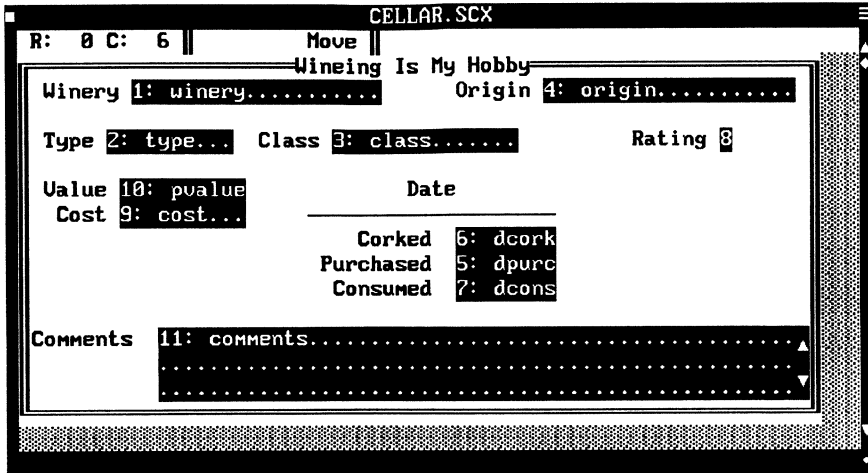


Figure 16: CELLAR.SCX

It might be useful to have your screen display the amount of money that you would make if you sold a bottle of wine. This amount can be calculated by subtracting the cost from the present value.

Create a calculated field to do this arithmetic for you.

### Creating a Calculated Field in a Screen

1. Draw a line on the screen under the **COST** field as shown in Figure 17.
2. Position the cursor where you want the text "Net" to appear as shown in Figure 17. Type `Net` then press Enter.
3. Using Figure 17 as a guide, position the cursor next to "Net" where your calculated field will appear.
4. Choose **Field...** from the **Screen** menu popup. The Screen Field dialog appears.
5. Choose the **Say** radio button at the top of the Screen Field dialog.
6. Type `CELLAR.PVALUE - CELLAR.COST` in the Say text box.
7. Choose the **Refresh** check box.
8. When the dialog appears as in Figure 18, choose **OK**.

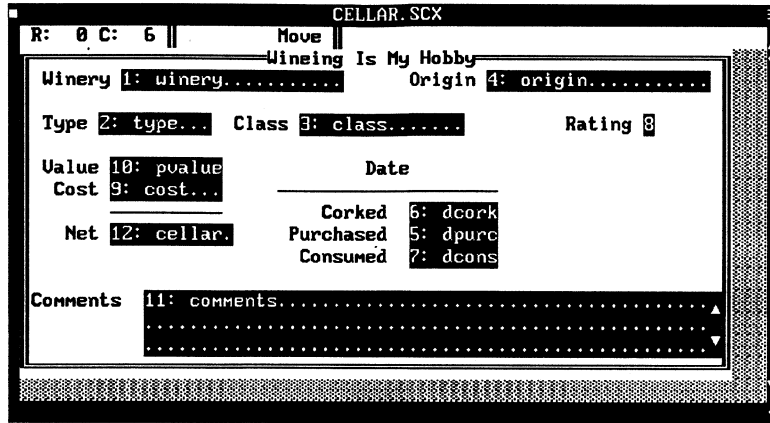


Figure 17: CELLAR.SCX with Calculated Field

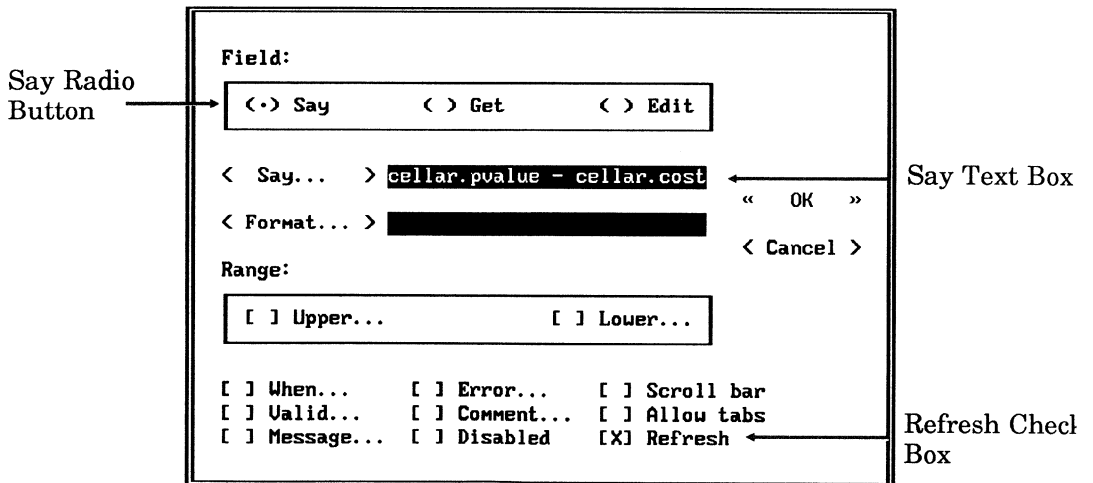


Figure 18: Screen Field Dialog

Another useful piece of information is the age of the wine. The age can be computed by subtracting the date the wine was corked from today's date.

When this calculation is performed, FoxPro returns the number of days between the corked date and today's date. If you divide this number by 365, you will get the age of the wine in years.

Create this calculated field.

### Creating Another Calculated Field

1. Position the cursor where the text "Age (years)" is to appear on the screen as shown in Figure 19, type Age (years) and press Enter.
2. Position the cursor directly beneath the "Age (years)" text.
3. Choose **Field...** from the **Screen** menu popup.
4. Choose the **Say** radio button.
5. Type `(DATE() - cellar.dcork)/365` in the **Say** text box.
6. Choose the **Refresh** check box.
7. When the Screen Field dialog appears as shown in Figure 20, choose **OK**.



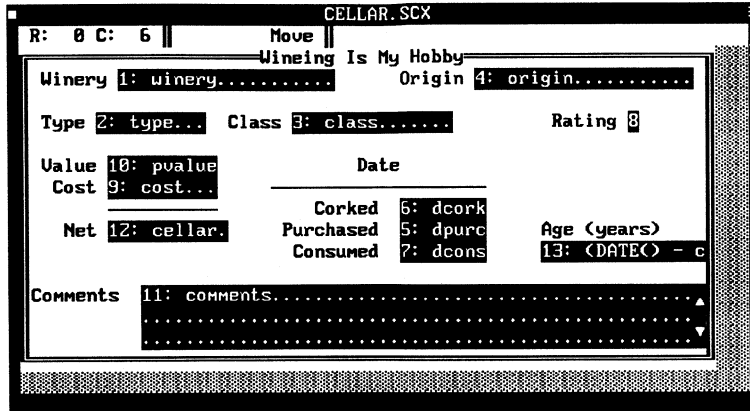


Figure 19: CELLAR.SCX with Another Calculated Field

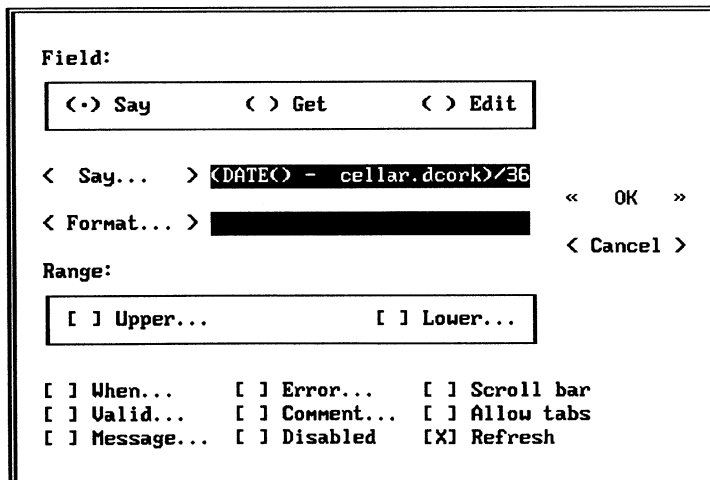


Figure 20: Screen Field Dialog

The rating system that you devised for your wines is based on a scale of 1 to 5. It would be easier to remember and rate your wines if these values were displayed as descriptive text.

Create a popup to accomplish this.

### Creating a Popup

1. Delete the **RATING** field but leave the “Rating” field title.
2. Position the cursor directly beneath the “Rating” field title.
3. Choose **Popup...** from the **Screen** menu popup. The Popup dialog appears.
4. Choose the **Choose...** push button. The Choose Field/Variable dialog appears.
5. Choose **Rating** from the **Database Fields** list so that the Choose a Field or Variable text box appears as in Figure 21, then choose **OK**.
6. Type *Fatal, Septic, Nauseating, So-so, Sublime, Intense, Awesome* in the list on the left side of the Popup dialog as shown in Figure 22.
7. Choose **So-so** from the **Initial** popup.
8. When the Popup dialog appears as shown in Figure 22, choose **OK**. **CELLAR.SCX** now contains a popup as shown in Figure 23.

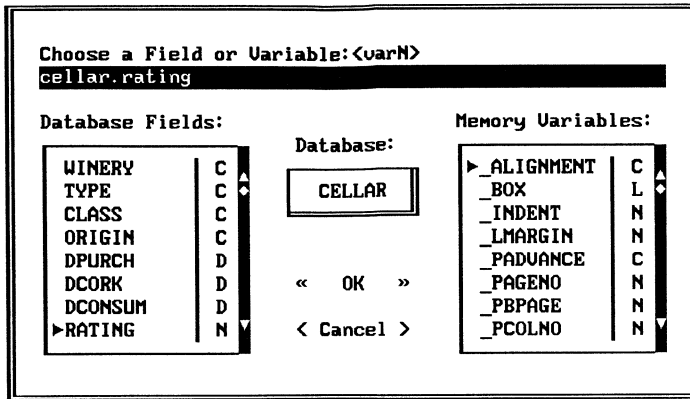


Figure 21: Choose Field/Variable Dialog

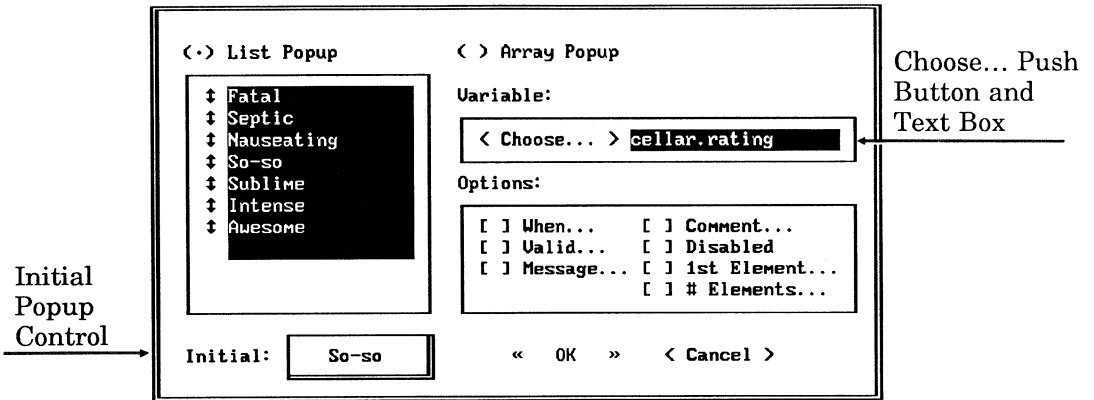


Figure 22: Popup Dialog

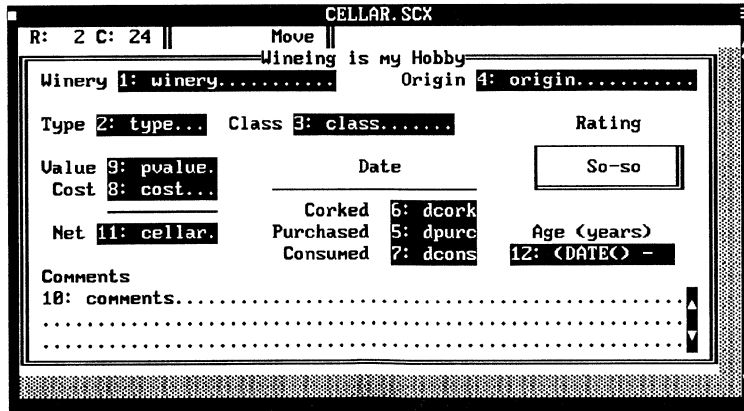


Figure 23: CELLAR.SCX with Rating Popup

To use this new screen, FoxPro must regenerate the program.

We've also provided a screen called CONTROL3.SCX that you can combine with your screen to allow you to navigate through your database.

Let's use the screen generator to combine two screens and create a program.

### Combining Two Screens

1. Choose **Generate...** from the **Program** menu popup. An alert appears asking if you want to save changes to CELLAR.SCX. Choose **Yes**.
2. Choose the **Add** push button in the Generate dialog. The Open File dialog appears. (Figure 24)
3. Select CONTROL3.SCX then choose **Add**. The Generate dialog appears as in Figure 25.
4. Choose **Arrange** from the Generate dialog.
5. Using Figure 26 as a guide, arrange the screens on your monitor.
6. Choose **Save** from the **Arrange** menu popup. The Generate dialog reappears.
7. Choose **Generate**. An alert tells you that CELLAR.SPR already exists and asks if you want to overwrite it. Choose **Yes**.

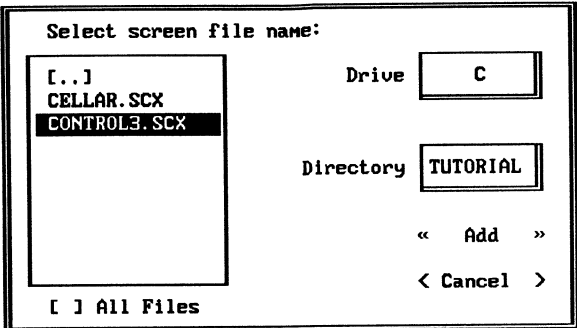


Figure 24: Open File Dialog

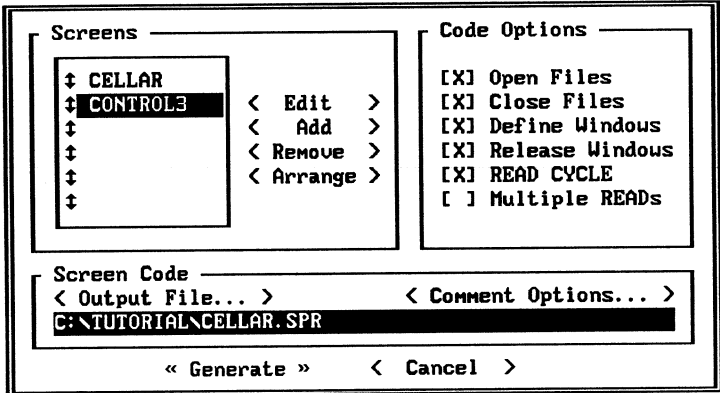


Figure 25: Generate Dialog

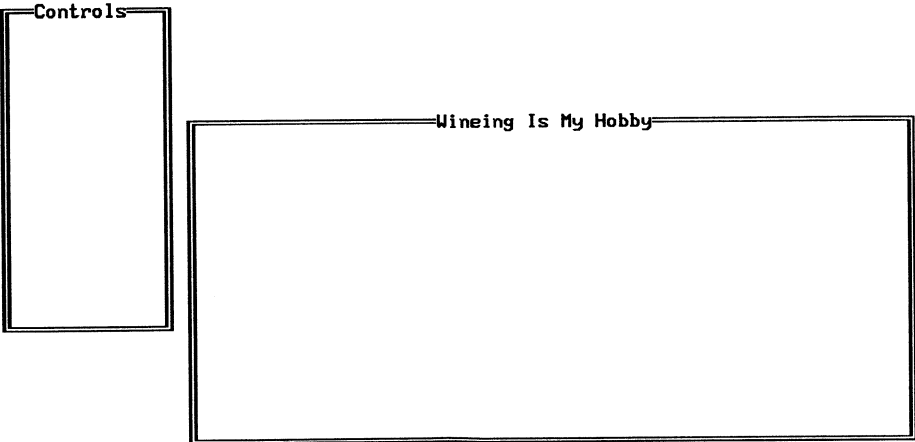


Figure 26: Screen Arrangement

To use these screens, commonly called a *screen set*, do the program CELLAR.SPR.

### Doing CELLAR.SPR

1. Close the Screen Design window.
2. Choose **Do...** from the **Program** menu popup.
3. Select CELLAR.SPR and choose **Do**. The screen set you've designed appears as in Figure 27.

Note that the windows in Figures 27 and 28 are in slightly different positions. You can move these windows just like the other windows you have encountered.

### Navigating Through Your Database

1. Choose any of the following push buttons from the Controls screen to move through CELLAR.DBF: **Top**, **Prior**, **Next** or **Bottom**.
2. Choose **Append** from the Controls screen. A blank input screen appears so you can add another record to CELLAR.DBF.
3. Type in the information as shown in Figure 28, then choose **Quit** from the Controls screen.

We know that the power of the Screen Builder can leave you breathless, so the coach calls a time out for you to catch your breath.

<b>Controls</b>		Wineing is my Hobby	
< Top >	Winery Mogen David	Origin ?	
<Prior >	Type Generic	Class Concord Grape	Rating
< Next >	Value 3.59	Date	Awesome
<Bottom>	Cost 3.59	Corked / /	Age (years)
<Append>	Net 0.00	Purchased 02/12/91	0.00
< Quit >	Consumed / /		
	Comments		
	This was a gift from Bert.		

Figure 27: Screen Set

Controls screen moved down

<b>Controls</b>		Wineing is my Hobby	
< Top >	Winery Aunt Wilma's	Origin grapes ?	
<Prior >	Type Generic	Class Grape	Rating
< Next >	Value -5.00	Date	Fatal
<Bottom>	Cost 0.00	Corked 04/09/88	Age (years)
<Append>	Net -5.00	Purchased 05/21/89	3.07
< Quit >	Consumed / /		
	Comments		
	This is one of Aunt Wilma's best!		

Figure 28: Appended Record





## Generating an Application with FoxApp

In this session you'll generate an application using FoxApp. You'll also learn more about the Command window.

- Starting FoxApp . . . . . page 2
- Using CELLAR.DBF with FoxApp . . . page 4
- Generating an application . . . . . page 6
- Starting an application . . . . . page 8
- Opening an application file . . . . . page 12
- The Command window . . . . . page 14

## Generating an Application with FoxApp

---

In Session 7 you created and modified your own database. In the last session you designed an attractive custom screen for your database. In this session you are going to “pull it all together” and learn about a program called FoxApp, the FoxPro Application Generator.

FoxApp is not really part of FoxPro — it’s one of the sample programs provided to illustrate the flexibility and power of FoxPro. Feel free to look at and change FoxApp if you so desire.

FoxApp gives you a way to organize the tools that you’ve learned about so far. FoxApp takes a database and a screen and creates an *application* that allows you to manage your database even more efficiently.

The easiest way to learn about FoxApp is to use it.

### Starting FoxApp

1. Choose **Do...** from the **Program** menu popup. The Do dialog appears. (Figure 1)
2. Select FOXAPP.APP and choose **Do**. The FoxApp dialog appears. (Figure 2)

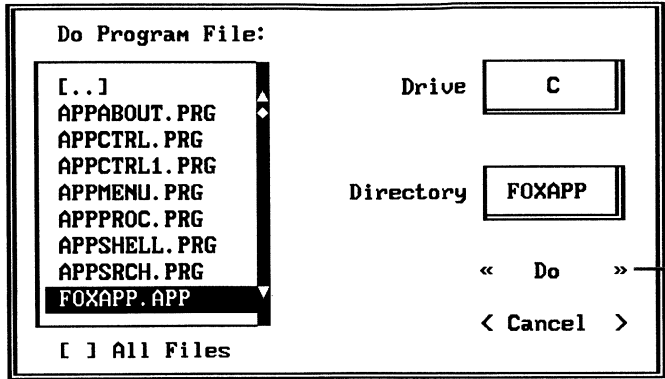


Figure 1: Do Dialog

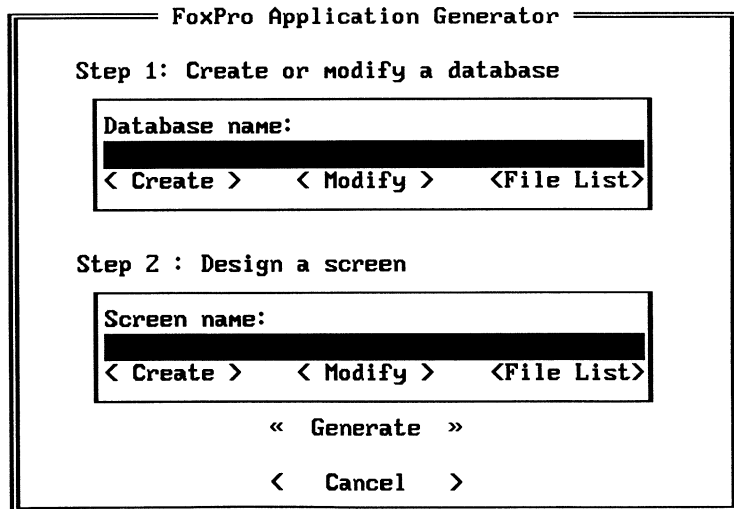


Figure 2: FoxApp Dialog

The first step when using FoxApp is to select a database. If the database does not yet exist, FoxApp allows you to create it. FoxApp also allows you to change the structure of a database.

Because the database CELLAR already exists, tell FoxApp to use it.

### Using CELLAR.DBF with FoxApp

1. Choose the **File List** push button in the Step 1 area of the FoxApp dialog. The Open File dialog appears. (Figure 3)
2. Select CELLAR.DBF then choose **Open**. The FoxApp dialog appears as in Figure 4.

When you selected your database, FoxApp found the screen with the same name and automatically placed it in the Screen Name text box in the FoxApp dialog.

If an appropriate screen is not available, FoxApp is very flexible — it allows you to access the FoxPro Screen Builder so you can design and modify a screen to use in your application.

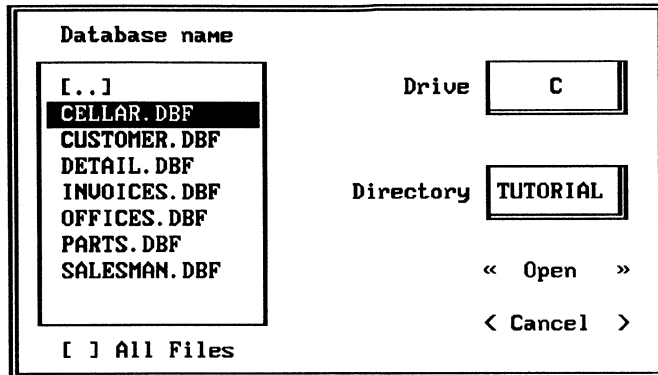


Figure 3: Open File Dialog

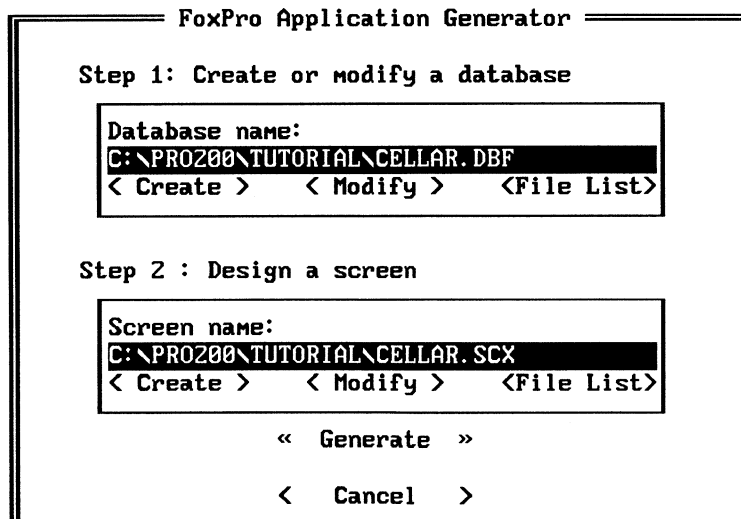


Figure 4: FoxApp Dialog with CELLAR.DBF and CELLAR.SCX Information

## Generating an Application with FoxApp

Now that you have a database and a screen to work with, tell FoxApp to generate your application.

FoxApp first asks you to name your application. In your case, the default is the name you've already given to your database and screen. This would make an ideal name for an application.

### **Generating an Application with FoxApp**

1. Choose the **Generate** push button at the bottom of the FoxApp dialog. The Save As dialog appears with CELLAR.APP entered in the text box. (Figure 5)
2. Choose **Save**. FoxApp tells you it is generating your application and displays a thermometer indicating its progress. (Figure 6)

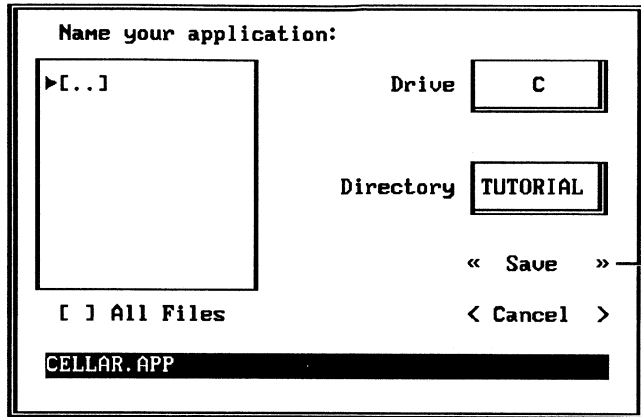


Figure 5: Save As Dialog

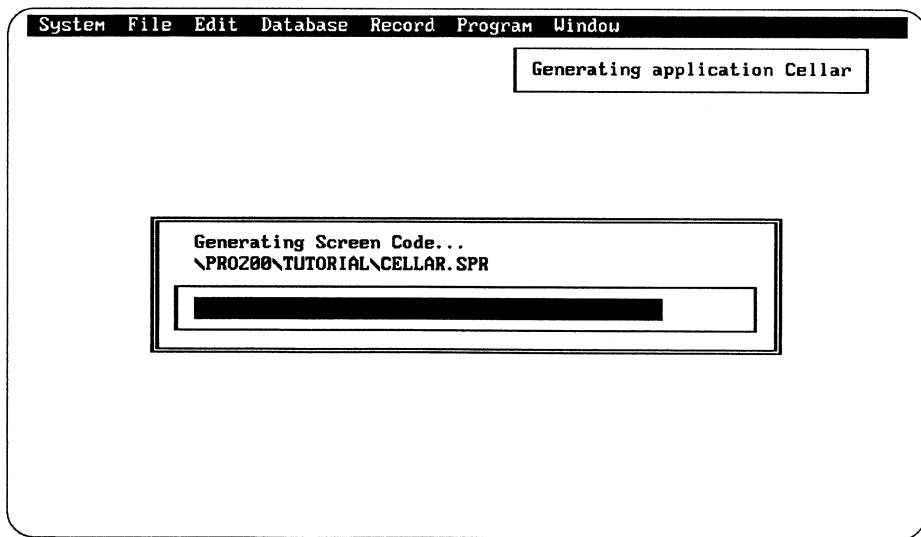


Figure 6: FoxApp's Message and Thermometer

When FoxApp finishes generating your application, a message appears on your screen telling you to press any key to start your application.

### **Starting Your Application**

Press any key. Your application appears as in Figure 7.

Your application consists of an input screen, a control screen and a menu bar.

The input screen and control screen help you to navigate easily through your database file, as you learned to do in Session 8.



Wineing is my Hobby

Winery Aunt Wilma's      Origin grapes ?

Type Generic      Class Grape      Rating

Value	-5.00	Date		Fatal
Cost	0.00			
Net	-5.00	Corked	04/09/88	Age (years)
		Purchased	05/21/89	3.07
		Consumed	/ /	

Comments  
This is one of Aunt Wilma's best!

< Top > < Prior > < Next > < Bottom > < Search > < Quit >

Figure 7: Generated Application

The **System** and **Edit** menu popups in your application are shortened versions of FoxPro's **System** and **Edit** menu popups.

The **Application** and **Utilities** menu popups contain a variety of options, as shown in Figure 8. These options enable you to perform additional operations on your database file. You're already familiar with the actions of many of the options on these popups. The **Top**, **Bottom**, **Next** and **Prior** options correspond to the push buttons on the control screen. Notice that your application allows you to add, copy and delete records as well as browse your database. You can even create a report or a query. Your application places all of these options at your fingertips!

You're probably anxious to play with your application. Go ahead and play for a while. When you're done, choose the **Quit** push button on the control screen.

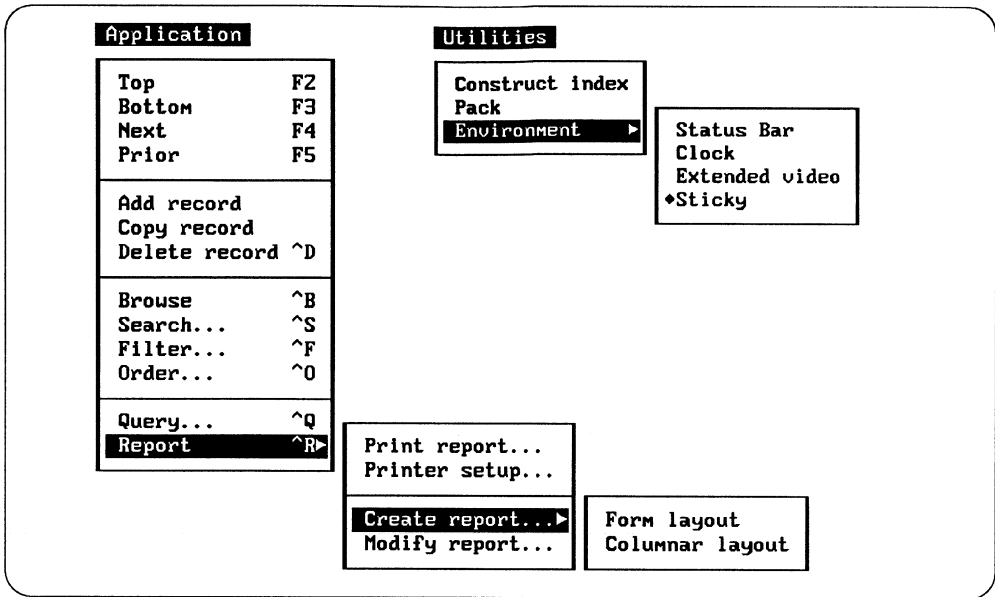


Figure 8: Application and Utilities Menu Popups

Applications are simply a series of FoxPro *commands* that have been entered into a file. Commands are statements that tell FoxPro what to do. When FoxApp generated your application, it placed many FoxPro commands into several files.

Let's look at one of these files.

### Opening an Application File

1. Choose **Open...** from the **File** menu popup. Make sure **Program** is showing on the **Type** popup control, select **STARTUP.PRG** then choose **Open**. A program editing window appears with FoxPro code in it.
2. Scroll through some of the commands. (Figure 9)
3. Close the program editing window.

```
STARTUP.PRG
SELECT 0
USE C:\FOXPRO\tUTORIAL\CELLAR.DBF
SET ORDER TO 1
ENDIF
IF RECCOUNT(<) = 0
  APPEND BLANK
ENDIF
GOTO TOP
CLEAR
DO WHILE !bailout
  * Display the screen control panel
  DO appctrl WITH 22,3
  * Display the main screen file
  DO cellar.spr
ENDDO
* Clean up after the application
RELEASE ALL LIKE *.*
SET PROCEDURE TO
CLOSE DATABASES
CLEAR ALL
```

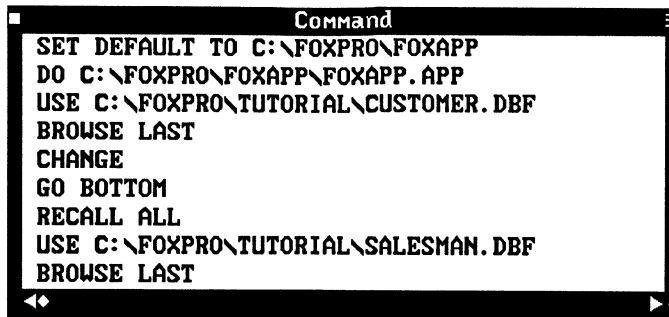
Figure 9: STARTUP.PRG

You can enter commands in the Command window.

The Command window contains a history of all the commands used since you started FoxPro. You can scroll through these commands to look at them, or even re-execute them if you desire. Figure 10 shows the Command window as it may appear during a FoxPro session.

Everything that you do when you use the interface can be accomplished by entering commands into the Command window.

FoxPro's commands are organized alphabetically and explained in detail in the FoxPro *Commands & Functions* manual. Each command is also explained in FoxPro's on-line help system.



```
Command
SET DEFAULT TO C:\FOXPRO\FOXAPP
DO C:\FOXPRO\FOXAPP\FOXAPP.APP
USE C:\FOXPRO\TUTORIAL\CUSTOMER.DBF
BROWSE LAST
CHANGE
GO BOTTOM
RECALL ALL
USE C:\FOXPRO\TUTORIAL\SALESMAN.DBF
BROWSE LAST
```

Figure 10: Command Window

If the Command window isn't visible, activate it and try out some commands.

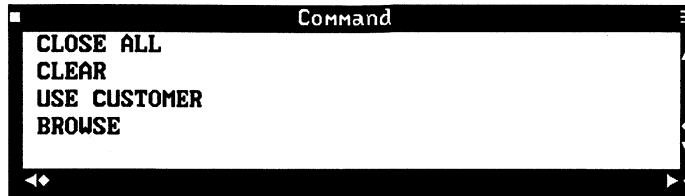
### Typing Commands in the Command Window

1. If the Command window isn't visible, choose **Command** from the **Window** menu popup.
2. Type `CLOSE ALL` in the Command window then press Enter.
3. Type `CLEAR` in the Command window then press Enter.
4. Type `USE CUSTOMER` in the Command window then press Enter.
5. Type `BROWSE` in the Command window then press Enter. The Command window appears as in Figure 11.
6. Close the Browse window.

At this point, things should look familiar. You issued the `USE` command which opened the `CUSTOMER` database. The `BROWSE` command you entered activated the Browse window. When you closed the Browse window, you returned to the Command window.

By observing what happens in the Command window when you select menu options, you can easily learn many FoxPro commands.





**Figure 11: Command Window with Commands You Typed**



# Now What?

## Now What?

This session reviews what you've learned and directs you to other sources so you can continue to learn about FoxPro.

---

## Now What?

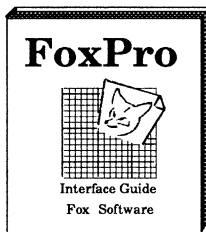
---

Congratulations! You've just been introduced to one of the most powerful database management systems in the universe. You've learned to:

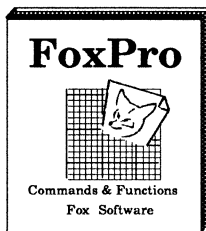
- Create databases and fill them with data
- View data in a Browse window
- Extract specific data using RQBE
- Create professional reports with the Report Writer
- Design custom screens with the Screen Builder
- Create a simple application

You can now use FoxPro's powerful tools to quickly and efficiently manage your data. But this is just the beginning. FoxPro is a dynamic and multi-faceted database management system. You can continue your studies and develop your own custom applications that utilize all of FoxPro's functionality.

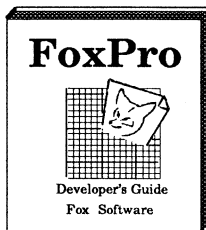
There are many places to learn more about FoxPro. The first place to look is in the remaining FoxPro manuals.



The *Interface Guide* teaches you more about FoxPro's interface, including FoxPro's menus, Report Writer, Label Designer, Screen Builder, Menu Builder, RQBE and Project Manager.



*Commands & Functions* contains FoxPro's commands, functions and system memory variables, listed alphabetically for easy access. It includes examples to demonstrate how to use the language.



The *Developer's Guide* covers topics of particular interest to those who develop applications. Topics include tips for using projects, screens, menus, browse, select, arrays, low-level file I/O, optimization, text merge and FoxDoc. Customizing help, debugging applications and customizing FoxPro are also discussed.

The following additional sources are available:

- Classes on FoxPro in your area. Consult the training list included with the product and the *Fox Software Developers Directory* for trainers in your area. Also check with local colleges and universities.
- *Fox Software Developers Directory*. This book can assist you in finding consultants and third party FoxPro applications.
- FOXFORUM on CompuServe. See the Customer Support chapter in the appendix of the *Developer's Guide*.
- Fox Software Developer Conference. Contact the Fox Software Marketing Department for registration information.
- Current FoxPro books. A third party book list is included with the product.
- User groups. Contact the Fox Software Marketing Department for a list of Fox user groups in your area.
- Database oriented magazines.

As you can see, many options are available for learning more about FoxPro. You can choose the option that meets your needs.

Good luck!



## DOS and FoxPro

This appendix section discusses how to use DOS to create and organize FoxPro files on your computer. It is not intended to be a DOS tutorial — if you are not familiar with DOS, consult your DOS manual or one of the many available DOS books.

- What is DOS? . . . . . page 2
- How does DOS organize files? . . . . . page 4

## What is DOS?

---

DOS is an acronym for Disk Operating System. DOS controls your computer and the devices connected to it (the keyboard, printers, disk drives and so on).

Your computer uses DOS to create and organize information in the form of *files* — all information on your computer is contained in files. A file can contain a program (like FoxPro), data (like a FoxPro database), text (created with the FoxPro text editor) and so on.

### DOS File Names

When you create a file in FoxPro, you are asked to supply a file name. Certain DOS rules apply to the file name.

A file name can be from one to eight characters long, and cannot contain spaces. DOS reserves certain characters for its own use, and these characters cannot be included in a file name. Reserved characters are:

DOS Reserved Characters			
.	,	;	:
"	?	\	/
*	+	=	
[	]	<	>

Any combination of letters, numbers and symbols other than the reserved characters above can be used in a file name.

### DOS File Extensions

In addition to the file name, you can include an optional extension when naming a file. A file extension is a period followed by one to three characters. The characters you can include in a file extension are the same as those allowed in a file name. The file extension usually indicates the file type. For example, FoxPro database files have a .DBF extension and program files have a .PRG extension.



The following table lists some of the default file extensions used for FoxPro files and the corresponding file type.

Extension	File Type
.CDX	Compound Index
.DBF	Database
.FRX	Report
.LBX	Label
.MNX	Menu
.PJX	Project
.PRG	Program
.QPR	Query
.SCX	Screen

## Special Files

Three special text files affect the operation and performance of FoxPro. Two of these files, CONFIG.SYS and AUTOEXEC.BAT, are used to configure your computer. The third, CONFIG.FP, is a file that configures FoxPro when FoxPro is started. These files and their use by FoxPro are discussed in greater detail in the *FoxPro Developer's Guide*.

The CONFIG.SYS system configuration file is a special file that is read whenever you turn on your computer. It initializes your computer, and can contain settings that affect FoxPro.

Two settings in your CONFIG.SYS file affect FoxPro — FILES and BUFFERS. The FILES setting determines how many files can be opened in FoxPro, and the BUFFERS setting can be adjusted to optimize FoxPro's performance.

The AUTOEXEC.BAT file contains a set of DOS commands that are executed when you turn on your computer. A DOS PATH command can be included in your AUTOEXEC.BAT file to tell DOS and FoxPro where to look for files. A DOS SET command can be included to tell FoxPro where to look for its configuration file.

CONFIG.FP, the FoxPro configuration file, can include a long list of commands that adjust FoxPro to your liking. You can also specify where the temporary files that FoxPro creates are located. Proper placement of these temporary files can greatly improve FoxPro's performance.

## **How Does DOS Organize Files?**

DOS organizes files by drive and directory.

### **Disk Drives**

Files are stored by your computer on *disk*. There are two types of disks — external floppy disks that you insert into your computer, and fixed disks permanently installed in your computer. During the FoxPro installation process, FoxPro files contained on a set of floppy disks are copied onto your computer's fixed disk. FoxPro then uses the files on your fixed disk.

Floppy and fixed disks reside in a disk drive. A disk drive is the mechanical device that writes and reads information to and from a disk. Disk drives are referenced by a *drive letter* — a single alphabetic character used to identify the drive. A and B are usually used to identify floppy disk drives, and the letters C through Z identify fixed disk drives. Fixed disks are sometimes called *hard drives*.

### **Specifying the Current Disk Drive**

During the installation of FoxPro you may have to specify a *current disk drive*. DOS commands act on the current disk drive (when a different disk drive isn't specified with the command). You can specify the current disk drive from the DOS prompt.

To make a disk drive the current drive, type the drive letter followed by a colon (:) at the DOS prompt, then press Enter. For example, to make the A drive the current drive, at the DOS prompt type

A:

and press Enter.

To make the C drive the current drive, at the DOS prompt type

C:

and press Enter.

## Disk Drive Directories

A large number of files can be stored on a disk. To organize these files, a *directory* can be created to group files together. For example, FoxPro program files are usually placed in a directory named FOXPRO.

A directory can contain files and additional directories called *sub-directories*. FoxPro demonstration files are usually placed in a subdirectory named DEMO in the FOXPRO directory, and the tutorial files are placed in a subdirectory named TUTORIAL.

Subdirectories can, in turn, contain more subdirectories. This organization of directories in other directories creates a tree-like structure. The main directory is called the *root* directory, with all other directories branching from the root directory.

## Changing Directories

You can move from directory to directory with the DOS change directory command, CHDIR. When you move to a directory, it becomes the current working directory. DOS commands act on the current directory (when a directory path isn't included with the command).

To move to the root directory, you can use the DOS command

```
CHDIR\
```

To move to another directory, place the directory name immediately after the CHDIR\ command. For example, to move to the FoxPro directory, use the command

```
CHDIR\FOXPRO
```

To move to a subdirectory in a directory, place a backslash between the directory and subdirectory names. For example, to move to the TUTORIAL subdirectory in the FOXPRO directory, use the command

```
CHDIR\FOXPRO\TUTORIAL
```

## Creating New Directories

To create a new directory or a subdirectory, use the DOS MKDIR make directory command, MKDIR. Before installing FoxPro you can create a directory to place the FoxPro program files in.

Use CHDIR to move to the directory where you create the new directory or subdirectory. Issue the command MKDIR followed by the name of the new directory or subdirectory. The following DOS commands make the FOXPRO directory the current directory, and then create a subdirectory named EXAMPLES:

```
CHDIR\FOXPRO  
MKDIR EXAMPLES
```

When naming directories and subdirectories, you must follow the same rules that apply when creating file names.

# Appendix B

---

## **Glossary**

This glossary includes basic definitions as well as more technical information.

---

**acronym** – A word formed from the initial letters of a name or phrase, such as ROM (from read-only memory).

**active window** – The foremost window on the screen, where the next action will take place. The controls on an active window are visible.

**address** – (n) A number that specifies the location of a single byte of memory. Addresses can be given as decimal integers or as hexadecimal integers. (v) The act of referring to a specific storage location.

**aggregate function** – In SQL, SUM( ), AVG( ), MIN( ), MAX( ), COUNT( ), NPV( ), STD( ), VAR( ).

**alert** – A warning or report of an error in the form of an alert box, a sound from the computer's speaker or both.

**algorithm** – A step-by-step procedure for solving a problem or accomplishing a task.

**alias** – An additional name assigned to a database. A database may be referenced by its alias and the work area it is opened in.

**AND** – A logical operator that produces a true result if both of its operands are true, and a false result if either or both of its operands are false. See also: OR, NOT.

**API** – An acronym for Application Program Interface. FoxPro's API allows your C and Assembly language routines to interact with FoxPro.

**application program** – A program written for some specific purpose such as word processing, database management, graphics, telecommunication or accounting.

**application software** – A collective term for application programs.

**argument** – A value on which a function or statement operates. It can be a number or a variable. For example, in the FoxPro statement SPACE(10), the number 10 is the argument. See also: operand.

**arithmetic expression** – A combination of numbers and arithmetic operators (such as 3 + 5) that indicates an operation to be carried out.

**arithmetic operation** – One of the five actions computers can perform with numbers: addition, subtraction, multiplication, division and exponentiation.

**arithmetic operator** – An operator, such as +, that manipulates numeric values to produce a numeric result. See also: logical operator, relational operator.

**array** – An ordered collection of data. Each element of the array can be referenced by a numerical subscript.

**ASCII** – Acronym for American Standard Code for Information Interchange, pronounced “ASK-ee”. It’s a code in which the numbers from 0 to 127 stand for text characters. ASCII code is used for representing text inside a computer and for transmitting text between computers or between a computer and a peripheral device.

**assembler** – A language translator that converts a program written in assembly language into an equivalent program in machine language.

**assembly language** – A low-level programming language in which individual machine language instructions are written in a symbolic form that’s easier to understand than machine language itself. Each assembly language instruction produces one machine language instruction. See also: machine language.

**auto indent** – A choice from the **Preference...** option of the **Edit** menu popup which automatically indents a line by the same amount as the previous line.

**average** – An internal computation that returns the arithmetic mean for the name field or expression.

**back up** – (v) To make a spare copy of a disk or of a file, on a disk. Backing up your files and disks ensures that you won’t lose information if the original is lost or damaged. (n) A copy of a disk or of a file on a disk. It’s a good idea to back up all of your important disks and to use the copies for everyday work, keeping the originals in a safe place.

**band** – An area in report that can contain text, database fields, calculated values, or user-defined functions as well as lines and boxes. Several different types of bands appear in a report.

**basic optimizable expression** – A basic optimizable expression can form an entire expression or can appear as part of an expression. The rules for combining basic optimizable expressions appear in the *FoxPro Commands & Functions* manual and in the *FoxPro Developer's Guide*.

**batch file** – A batch file contains commands that control the operation of the computer. These commands take the place of input from the keyboard.

**binary** – Characterized by having two different components, or by having only two alternatives or values available. Binary is sometimes used as a synonym for binary system.

**binary digit** – The smallest unit of information in the binary number system, a 0 or a 1 (also called a bit).

**binary file** – A file whose data is to be interpreted in binary form. Machine language programs and pictures are stored in binary files.

**bit** – A contraction of binary digit. It is the smallest unit of information that a computer can hold. The value of a bit (1 or 0) represents a simple two-way choice such as yes or no, on or off, positive or negative, and something or nothing.

**body** – The statements or instructions that make up a part of a program, such as a loop or a subroutine.

**Boolean operator** – An operator, such as AND, that combines logical values to produce a logical result, such as true or false. It is also known as a logical operator. See also: arithmetic operator, operator, relational operator.

**boot** – Another way to say “start up.” A computer boots by loading a program into memory from an external storage medium, such as a disk. Starting up is often accomplished by loading a small program that then reads a larger program into memory.

**branch** – (v) To pass program control to a line or statement other than the next in sequence. (n) A statement that performs a branch. See also: conditional branch, unconditional branch.

**breakpoint** – A breakpoint causes execution to pause and returns control temporarily to you.

**browse** – To display data in a Browse window.



**buffer** – A holding area of the computer's memory where information can be stored by one program or device and then read at a different rate by another. In editing, it is an area in memory where cut or copied data is held, sometimes called the clipboard. See also: type-ahead buffer and clipboard.

**bug** – An error in a program that causes it not to work as intended.

**byte** – A unit of information consisting of a fixed number of bits. On many systems, one byte consists of a series of eight bits, and a byte can represent any value between 0 and 255. The bit sequence represents an instruction, letter, number, punctuation mark, or other character. See also: kilobyte, megabyte.

**calculated value** – A value that is a report created from a formula. A formula can consist of database fields, constants, and/or functions connected by operators.

**call** – (v) To request the execution of a subroutine, function or procedure. (n) A request from the keyboard or from a procedure to execute a named procedure. See also: procedure.

**called program** – A routine, UDF or procedure that is executed.

**calling program** – A program that executes the called routine, UDF or procedure

**cancel** – To stop execution of a command file and return control to FoxPro.

**Capslock key** – A key that, when engaged, causes subsequently typed letters to appear in upper-case. It has the same effect on letter keys as the Shift key.

**carriage return** – An ASCII character (decimal 13) that ordinarily causes a printer or display device to place the next character at the left margin.

**case-sensitive** – Able to distinguish between upper-case characters and lower-case characters. Programming languages are case sensitive if they require all upper-case letters, all lower-case letters, or proper use of upper-case and lower-case letters.

**central processing unit (CPU)** – The brain of the computer; the microprocessor that performs the actual computations in machine language. See also: microprocessor.

**character** – Any symbol that has a widely understood meaning and thus, conveys. Letters, numbers and punctuation are characters that can be displayed on the monitor and printed on a printer. See also: control character.

**character code** – A number used to represent a character for processing by a computer system.

**character expression** – A collection of character data that's treated as a unit.

**character field** – A field, with a maximum width of 254, that may include all keyboard characters (letters, numbers and punctuation symbols) and any graphic (box-drawing), foreign alphabet and special symbol characters.

**character keys** – The letter, number, symbol and punctuation keys on a computer keyboard used to generate or format text; any key except Alt, Capslock, Ctrl, Esc, Shift, Enter, etc.

**character limit** – The maximum number of characters allowed in a single command.

**character pitch** – The number of characters per inch printed along a horizontal line.

**character set** – The entire set of characters that can be either shown on a monitor or used in printed output. With a printer, it's the entire set of characters that the printer is capable of printing.

**character style** – A set of stylistic variations, such as bold, italic and underline, which can be applied to a character set.

**check box** – A pair of square brackets followed by text. Settings can be turned on and off by choosing the check box. If a check box has an X in it, the setting is on.

**choose** – To select a command or an option from a menu, or a control in a dialog.

**clause** – An additional statement that follows a command or function key word.

**clear** – To erase data from the screen and/or from memory.

**cleanup code** – Code that is executed after the menu definition code and may contain code snippets for procedures.

**code snippets** – A code snippet is a procedure or an expression associated with a specific menu pad, menu popup or menu option. You can also define code snippets that perform actions on the entire menu system.

**click** – Press and release the mouse button once.

**click on** – To position the mouse pointer on something, then press and release the mouse button.

**clipboard** – The holding place for what you last cut or copied; a buffer area in memory. Information contained on the clipboard can be inserted (pasted) into other documents.

**clock chip** – A special chip in which the current date and time are stored. This chip is powered by a battery when the system is off, thus preserving the information.

**close** – To make a window disappear from the screen.

**clusters** – Disk space is allocated to files in units called clusters. The size of a cluster depends on your particular system.

**code** – (1) A number or symbol used to represent some piece of information. (2) The statements or instructions that make up a program.

**color pair** – A foreground and background color combination. A variety of these combinations are available for you to choose from the color palette of the Color Picker dialog.

**color palette** – The color palette is part of the Color Picker dialog and contains color pairs — background and foreground color combinations — which you can choose for each radio button.

**color scheme** – A group of color pairs that can be specified using the radio buttons in the Color Picker dialog.

**color set** – A group of color schemes that determines how FoxPro will assign colors to objects. Different color sets can be defined for monochrome, CGA and VGA monitors. Users may also want to define color sets to make the interface more aesthetically pleasing.

**column** – The vertical arrangement of character cells on the display screen.

**command** – An instruction that causes the computer to perform some action. A command can be typed from a keyboard, selected from a menu with a hand-held device (such as a mouse), or embedded in a program.

**command condition** – Specifies the set of database records to which a For or While clause applies.

**command key word** – A portion of a command that is English-like and describes the action that will occur.

**command scope** – A condition that specifies the general set of database records to which a command applies.

**command structure** – The nature and interrelations of all the possible instructions that can be sent to a device, such as a computer or printer.

**compact single entry index** – An index file limited to one index entry. This index file must be explicitly opened and be active to be updated with a database.

**compiler** – A language translator that converts a program written in a high-level programming language (source code) into an equivalent program in some lower-level language such as machine language (object code) for later execution.

**compiler directive** – A REGION# command used in a program to isolate memory variables and avoid name collisions in screen sets.

**compound index file** – An index file containing multiple index entries, called tags.

**computer language** – See programming language.

**concatenate** – Means literally, to chain together. It involves combining two or more strings into a single, longer string by joining the beginning of one to the end of the other. It also refers to combining two or more files.

**conditional branch** – A branch whose execution depends on the truth of a condition or the value of an expression. See also: unconditional branch.

**configuration** – (1) The total combination of hardware components — central processing unit, video display device, keyboard, and peripheral devices — that makes up a computer system. (2) The software settings that allow various hardware components of a computer system to communicate with each other.

**constant** – In a program, a symbol that represents a fixed, unchanging value. See also: variable.

**context-sensitive** – Able to perceive the situation in which an event occurs. For example, an application program might present help information specific to the particular task you're performing, rather than a general list of commands; such help would be context-sensitive.

**control** – A push button, check box, radio button, popup control, list or text box in a dialog that is used to designate, confirm or cancel actions.

**control break** – An expression that defines the contents of a group in a report.

**control character** – A nonprinting character that controls or modifies the way information is printed or displayed. Control characters have ASCII values between 0 and 31. Typically, control characters are typed from a keyboard by holding down the Ctrl key while pressing some other key.

**control code** – One or more nonprinting characters included in a text file whose function is to change the way a printer prints the text. For example, a program may use certain control codes to turn boldface printing on and off. See also: control character.

**control key** – A general term for a key that controls the operation of other keys (e.g., Alt, Capslock, Ctrl and Shift). When you hold down or engage a control key while pressing another key, the combination makes the other key behave differently.

**Control key** – A specific key that produces control characters when used in combination with other keys, usually abbreviated Ctrl.

**control key shortcuts** – The keystroke combinations that you can use instead of choosing menu options.

**controlling database** – When databases are related, the controlling database controls the order in which the records in other databases are accessed.

**coordinate** – One of a pair of numbers that designates a position on the screen. The numbers correspond to the columns (vertical placement) and rows (horizontal placement) of the screen display.

**copy** – To make a copy of the selected text and place it on the clipboard, leaving the original text intact.

**count** – An internal computation that returns the number of records displayed in a given portion of a report.

**CPU** – See central processing unit.

**current input device** – The source, such as the keyboard or a modem, from which a program is currently receiving its input.

**current output device** – The destination, such as the display screen or a printer, currently receiving a program's output.

**cursor** – A symbol on the screen that marks where the user's next action will occur or where the next character typed from the keyboard will appear.

**cut** – To remove something by selecting it and choosing Cut from a menu. The item that you cut is placed on the clipboard. In other editing applications, delete serves the same purpose.

**data** – Facts, figures, values, and other materials that are used or operated on by a program. The smallest unit of data that a computer can understand is a bit.

**database** – A collection of information that is organized so that it can be readily manipulated and sorted by a computer user.

**database management system** – A software system for organizing, storing, retrieving, analyzing and modifying information in a database.

**database field** – Any data item contained in a database record. One or more fields make up a database record, and one or more records make up a database file.

**data format** – The form in which data is stored, manipulated or transferred. Transmitted and received serial data typically has a data format of one start bit, five to eight data bits, an optional parity bit, and one or two stop bits.

**date field** – A field, with a length of eight, used for dates in the format of month (MM), day (DD) and year (YY).

**data grouping** – Categorizing data in groups in a report corresponding to a specified order. Headers and footers can be defined to print every time the value for a group changes.

**data type** – One of the six different types of data in FoxPro including character, numeric, float, logical, date and memo.

**debug** – To locate and correct an error, problem or malfunction in a computer program. Usually synonymous with troubleshoot. See also: bug.

**decimal system** – The common form of number representation in which numbers are expressed in the base 10 system, using the ten digits, 0 through 9.

**default** – A preset response to a question or prompt. The default is automatically used by the computer if you don't supply a different response. Default values prevent a program from stalling or crashing if no value is supplied by the user.

**default button** – The push button in dialogs, enclosed by double angle brackets, that is chosen when you press Ctrl+Enter.

**delete** – To remove a character or word from a file, or a file from a disk. Keys such as the Backspace key and the Delete key erase one character at a time.

**Delete key** – A key that erases the character on which the cursor is positioned.

**delimiter** – A character that marks the beginning or end of a sequence of characters and is not considered part of the sequence itself. For example, the double quotation mark (") is one delimiter for string constants — the string "DOG" consists of the three characters D, O, and G, and does not include the quotation marks.

**deselect** – To remove the highlighting.

**desk accessories** – Generally useful items such as a calculator, calendar, ASCII chart, file and directory manager, etc. that are listed on the **System** menu popup.

**desktop** – The screen, that underlies all system and user-defined windows is sometimes called the desktop.

**destination** – When you are making a copy of a file, the destination is the location you are copying to. See also: source.

**details level** – The details level of the Help window displays information for a topic.

**detail band** – An area of the report that typically contains one or more lines for each record that is printed from the database.

**device name** – The name used in path names to refer to a particular device without regard to the files associated with the device.

**dialog** – A box that contains a message requesting more information to complete a command or an expression.

**dimension** – The maximum size of one of the subscripts of an array.

**dimmed** – Text and areas that are dimmed have little contrast with the surroundings, making them less obvious.

**directory** – A list of the contents of a directory, subdirectory or a disk. It's a file that contains a list of all the names and locations of other files stored on a disk. These other files may themselves be directories (called subdirectories).

**disable** – To make a control (or part of it) unavailable for use, you can disable it. Disabled items appear in disabled colors and cannot be selected or chosen.

**disabled** – Sometimes, certain menu pads, menu options and controls in dialogs appear dimmed and cannot be chosen. These are disabled.

**disk** – An information storage medium consisting of a flat, circular, magnetic surface on which information can be recorded in the form of small magnetized spots, similar to the way sounds are recorded on tape. See also: hard disk.

**disk drive** – The device that holds a disk, retrieves information from it, and saves information to it.



**Disk Operating System (DOS)** – The software system that enables the computer to control and communicate with disk drives and other peripherals.

**disk space** – The amount of space available on a disk for storing or processing a document or an application.

**display** – A general term to describe what you see on the screen of your display device when you're using a computer.

**display color** – The color currently being used on the display screen.

**display device** – A device that displays information, such as a television or video monitor.

**dock** – The act of minimizing a window and placing it in the lower right corner of the screen.

**double-click** – To position the mouse cursor where you want an action to take place, and then to press and release the mouse button twice in quick succession without moving the mouse.

**double-click drag** – To double-click without releasing the mouse button on the second click, and continue holding down the mouse button while you drag.

**drag** – To position the pointer, press and hold down the mouse button, move the mouse and then release the mouse button.

**duration** – The length or persistence of a signal in time. See also: frequency.

**edit** – To change or modify. Editing includes inserting, removing, replacing or changing text.

**editor** – A program that helps you create and edit a particular form of information. FoxPro has a built-in text editor.

**element** – A member of a set or collection; specifically, one of the individual variables making up an array.

**embedded** – Contained within. For example, the string "HUMPTY DUMPTY" is said to contain one embedded space.

**emulate** – To operate in a way identical to a different system.

**enabled** – Available to be acted upon (a control).

**end-of-line character** – A character indicating that the preceding text constitutes a complete line.

**Enter key** – A key that causes the cursor to move to the beginning of the next line. It's also used in some cases to confirm or terminate an entry or a command.

**error code** – A number or other symbol representing a type of error.

**error condition** – The state of the hardware or program after it has detected a fault in one or more of the commands sent to it.

**error message** – A message displayed or printed to tell you about an error or problem in the execution of a program or in your communication with the system. An error message is often accompanied by a beep.

**escape character** – An ASCII character that, with many programs and devices, allows you to perform special functions when used in combination with other keys.

**escape code** – A sequence of characters that begins with an escape character and constitutes a complete command. Usually synonymous with escape sequence.

**Escape key** – A key that generates the escape character. The Escape key is labeled Esc on the keyboard. In many applications, pressing Esc allows you to return to a previous menu or to stop a procedure.

**escape sequence** – A sequence of keystrokes or output characters that begins with the Esc character. Escape sequences are typically used for positioning the cursor, controlling the display of text on the screen, or as codes to control printers.

**event-driven** – Instead of having to follow a rigid sequence determined by a program, the sequence of actions is determined by the user, for the most part. The computer responds to you instead of making you respond to it.

**execute** – To perform the actions specified by a program command or sequence of commands.

**expression** – A number, variable, word or group of words that can be evaluated to form a new value (of character, numeric, logical, float or date type).

**expression list** – One or more expressions separated by commas.

**Expression Builder** – The Expression Builder is a dialog that contains menus, field names and variables from the active database(s), and an area where an expression appears as you are building it.

**field** – A particular type or category of information in a database file.

**field object** – An object in a report or screen that draws its definition from a database field or memory variable.

**file** – Any named, ordered collection of information stored on a disk. Application programs and operating systems on disks are examples of files. You make a file when you create text or other data, give the material a name, and save it to disk.

**file management** – A general term for copying files, deleting files, and other chores involving the contents of disks.

**file name** – The name that identifies a file. The maximum character length of a file name and the rules for naming a file vary under different operating systems. See also: path name.

**file server** – A combination of controller software and a mass-storage device that allows computer users to share common files and applications through a network.

**file structure** – The arrangement of fields in a database file.

**file type** – The categories of files specified by FoxPro extensions: .APP, .DBF, .PRG, .CDX, .FRX, etc.

**flag** – A variable whose value (usually 1 or 0, standing for true or false) indicates whether some condition holds or whether some event has occurred. A flag is used to control the program's actions at some later time.

**flat copy** – When a flat copy is performed, all the files in all the tagged directories are copied to one single directory. The directory structure is not preserved.

**floating-point notation** – A method of representing numbers inside the computer in which the decimal point (more correctly, the binary point) is permitted to float to different positions within the number. Some of the bits within the number itself are used to keep track of the point's position.

**font** – (1) In typography, a complete set of type in one size and style of character. (2) In computer usage, a collection of letters, numbers, punctuation marks, and other typographical symbols with a consistent appearance; the size can be changed readily.

**font size** – The size of a font of characters in points. Examples of font size are 12 point and 18 point.

**format** – (n) (1) The form in which information is organized or presented. (2) The general shape and appearance of a printed page, including page size, character width and spacing, line spacing, and so on. (v) To divide a disk into tracks and sectors where information can be stored. Blank disks must be formatted before you can save information on them for the first time. The word format is synonymous with initialize.

**form feed** – An ASCII character (decimal 12) that causes a printer or other paper handling device to advance to the top of the next page.

**frequency** – In alternating current (AC) signals, the number of complete cycles transmitted per second. Frequency is usually expressed in hertz (cycles per second), kilohertz (kilocycles per second), or megahertz (megacycles per second). In acoustics, frequency of vibration determines musical pitch. See also: duration.

**function** – A preprogrammed calculation that can be carried out on request from any point in a FoxPro program. Because a function takes in one or more arguments and returns a single value, it can be embedded in an expression.

**generated code** – Code created by GENSCRN, the FoxPro screen generator or GENMENU, the FoxPro menu generator. Generated screen programs have an .SPR extension and generated menu programs have an .MPR extension. These programs are for debugging purposes and should not be directly edited.

**generated name** – A unique name generated by SYS(2015). These names are inserted in generated programs with corresponding clauses and code snippets.

**generator directive** – A command that communicates solely with GENSCRN, the FoxPro screen generator.

**graph** – A pictorial representation of data.

**graphic object** – Lines and boxes used in reports and screens.

**group band** – A group consists of fields that appear together based on some criteria that you specify by choosing the **Data Grouping...** option on the **Report** menu popup.

**group footer** – Report band in which objects can be defined to print each time a group expression changes. Group footers usually contain calculated values for data in the group.

**group header** – Report band in which objects can be defined to print each time a group expression changes. Group headers usually contain information to preface the data that will follow.

**group objects** – Combining two or more objects in a report or screen so that they act as one object to be moved, copied and pasted.

**hard disk** – A disk made of metal and sealed into a drive or cartridge. A hard disk can store very large amounts of information compared to a floppy disk.

**hard disk drive** – A device that holds a hard disk, retrieves information from it, and saves information to it. Hard disks made for microprocessors are permanently sealed into the drives.

**hexadecimal** – The representation of numbers in the base-16 system, using the ten digits 0 through 9 and the six letters A through F. For example, the decimal numbers 0, 1, 2, 3, 4, ... ,8, 9, 10, 11, ... ,15, 16, 17 would be shown in hexadecimal notation as 00, 01, 02, 03, 04, ... ,08, 09, 0A, 0B, ... ,0F, 10, 11. Hexadecimal numbers are easier for people to read and understand than binary numbers, and can be converted easily and directly to binary form. Each hexadecimal digit corresponds to a sequence of four binary digits, or bits.

**hide** – To make a window invisible without closing it.

**high bit ASCII characters** – These ASCII characters have decimal values of 128 to 255. They are called high ASCII because their high bit (first binary digit) is set to 1 (for on) rather than 0 (for off).

**high-level language** – A programming language that is relatively easy for people to understand. A single statement in a high-level language typically corresponds to several instructions of machine language. See also: low-level language.

**highlight** – To make something visually distinct. For example, when you select a block of text, the selected text is highlighted.

**highlighted** – Text that is emphasized so that it stands out from the surroundings. Highlighting something typically indicates that it is selected or is about to be chosen. Highlighted text may appear differently depending on the type of monitor and color settings that you use.

**hot key** – A highlighted letter that you can type to immediately choose the desired control in a dialog, display a menu popup when the menu bar is activated, or choose a menu option from a displayed popup.

**independent IDX** – Index files containing one index entry. An independent compound index file never has the same name as the database and will not automatically open with a database.

**index** – A file containing a list or table of entries that identifies the sequence or record ordering of a database file, based on key fields.

**indexed database** – A database whose entries have been ordered in a logical sequence.

**index key** – A file whose entries identify the logical position of data in a database.

**index variable** – A variable whose value changes on each pass through a loop. It is often called a control variable or a loop variable.

**infinite loop** – A section of a program that will repeat the same sequence of actions indefinitely.

**initialize** – (1) To set to an initial state or value in preparation for some computation. (2) To prepare a blank disk to receive information by organizing its surface into tracks and sectors. It is the same as formatting.

**input** – Information transferred into a computer from some external source, such as the keyboard, a disk drive or a modem. See also: output.

**input/output (I/O)** – The process by which information is transferred between the computer's memory and its keyboard or peripheral devices.

**insert** – To add a character or portion of text at the cursor position, shifting the text at the right of the cursor to the right.

**insert mode** – The default text editing mode in which any character you type is inserted at the cursor position and the text at the right of the cursor is shifted to the right.

**insertion point** – The place in a document where something will be added.

**integer** – A whole number in fixed-point form.

**interactive** – Operating by means of a dialog between the computer system and a human user.

**interface** – The point at which independent systems or diverse groups interact. It consists of the devices, rules or conventions by which one component of a system communicates with another. It is also the point of communication between a person and a computer.

**interrupt** – A temporary suspension in the execution of a program that allows the computer to perform some other task, typically in response to a signal from a peripheral device or another external source.

**invisible buttons** – Screen controls that are invisible. The behavior of invisible buttons can be defined in object level clauses for the buttons.

**I/O** – See input/output.

**join condition** – A join condition specifies the relationship between two databases and is often a field common to both databases, such as a customer number or a transaction number.

**K** – See kilobyte.

**keyboard shortcut** – See control key shortcut and hot key.

**key field** – A field that is used in an index; part of the index key.

**key word** – A special word or sequence of characters that identifies a particular type of statement or command, such as RUN, USE, or PRINT. Keywords are sometimes called reserved words because FoxPro reserves these special words for internal use.

**kilobyte (K)** – A unit of measurement consisting of 1024 ( $2^{10}$ ) bytes. In this usage, kilo (from the Greek, meaning a thousand) stands for 1024. Thus, 64K memory equals 65,536 bytes. See also: megabyte.

**leading zero** – A zero occurring at the beginning of a decimal number. It is deleted by most computing programs.

**line feed** – An ASCII character (decimal 10) that ordinarily causes a printer or video display to advance to the next line.

**line feed pitch** – The number of lines printed per vertical inch.

**line length** – The number of characters that fit on a line on the screen or on a page.

**link** – To connect programs compiled or assembled at separate times so that they can be executed together. See also: compiler.

**list** – To display on a monitor or print on a printer the contents of memory or of a file.

**literal** – A character that is entered as a constant part of a format. For example, the /'s in a date field (8/11/89) are literals.

**load** – To transfer information from a peripheral storage medium (such as a disk) into main memory for use; for example, to transfer a program into memory for execution.

**local** – Within the current program module.

**local alias** – In the SQL SELECT command, the local alias is a temporary name for a database specified in the FROM clause.

**lock** – To prevent documents, files or entire disks from being altered. Files can be locked with software commands. Entire disks can be physically locked by using a write-protect tab on the disk jacket; in this sense lock is synonymous with write-protect. See also: unlock.

**logic** – (1) In microcomputers, a mathematical treatment of formal logic using a set of symbols to represent quantities and relationships that can be translated into switching circuits or gates. AND, OR and NOT are examples of logical gates. Each gate has two states, open or closed, allowing the application of binary numbers for solving problems. (2) The systematic scheme which defines the interactions of signals in the design of an automatic data processing system.



**logical field** – A field that accepts only true or false conditions.

**logical operator** – An operator, such as AND, that combines logical values to produce a logical result (true or false); sometimes called a Boolean operator. See also: arithmetic operator, relational operator.

**loop** – A section of a program that is executed repeatedly until a limit or condition is met, such as a variable reaching a specified ending value.

**low-level language** – A programming language that is relatively close to the form the computer's processor can execute directly. One statement in a low-level language corresponds to a single machine language instruction. See also: high-level language.

**machine language** – The form in which instructions to a computer are stored in memory for direct execution by the computer's processor. Each model of computer processor has its own form of machine language. See also: assembly language.

**macro substitution** – Macro substitution allows memory variables to replace names. Macro substitution places an ampersand (&) before the memory variable to tell FoxPro to use the value of the memory variable as a name. A command or function containing a name expression executes faster than one containing macro substitution; always use a name expression instead of macro substitution.

**main memory** – The part of a computer's memory whose contents are directly accessible to the microprocessor; usually synonymous with random-access memory (RAM). Programs are loaded into main memory, where the computer holds information while you work. It is sometimes simply called memory. See also: read-only memory, read-write memory.

**main report** – The main report follows the report title and consists of the page header, report body and page footer.

**megabyte (MB)** – A unit of measurement equal to 1024 kilobytes, or 1,048,576 bytes. See also: kilobyte.

**memo field** – A memo field includes any letters, numbers and punctuation symbols from the keyboard plus any of the graphic (box-drawing), foreign alphabet and special symbol characters. The default memo width is 10 for the purpose of defining the database structure, but there is no actual size limit other than disk space.

**memory** – A hardware component of a computer system that can store information for later retrieval. See also: main memory, random-access memory, read-only memory, read-write memory.

**memory location** – A unit of main memory that is identified by an address and can hold a single item of information of a fixed size.

**memory-resident** – Held continually in memory even while not in use. For example, DOS is a memory-resident program.

**memory variable** – A location in the computer's memory where data is stored. You can change the contents of a memory variable but its name and storage area are reserved for use until you end the FoxPro session or release the memory variable. Memory variables and their values are lost unless you save them to disk before exiting FoxPro or shutting off the computer.

**menu** – A list of choices presented by a program, from which you can select an option.

**menu bar** – A horizontal strip that appears at the top of the screen and contains menu pads.

**menu options** – Commands, found on the menu popups, that perform specific actions.

**menu pads** – A word, phrase or icon on the menu bar that designates one menu. Positioning the cursor on a menu title highlights the title and display its options below it.

**menu popup** – List of related options. When you choose an option from a menu popup, you are telling FoxPro what action to take.

**menu title** – The menu pads found on the menu bar.

**menu system** – The combination of the menu bar, menu pads, menu popups and menu options.

**microcomputer** – A computer whose processor is a microprocessor.

**microprocessor** – A computer processor contained in a single integrated circuit. The microprocessor is the central processing unit (CPU) of the microcomputer. See also: processor.

**minimize** – The act of causing a window to become one line tall by 16 characters wide with the title of the window remaining visible.

**modal** – A window or dialog that does not allow another window or dialog to be brought in front of it until that window or dialog is dismissed, for example, the Expression Builder dialog.

**mode** – A state of a computer or system that determines its behavior (a manner of operating).

**mouse** – A small device you move around on a flat surface next to your computer. The mouse controls a pointer on the screen. The pointer's movements correspond to those of the mouse. You use the pointer to choose options, to move data, and to draw in graphics programs.

**mouse button** – The button(s) on the top of the mouse. In general, pressing a mouse button initiates some action on whatever is under the pointer, and releasing the button confirms the action. In FoxPro the left mouse button is used.

**multi-tasking** – A process that allows a computer to perform two or more tasks during a given period of time; it is accomplished by alternating the actions of the computer between tasks.

**name expression** – Although a name cannot be a memory variable or array element, you can create a name expression that substitutes the value of a character type memory variable or array element as the name. Name expressions provide flexibility in FoxPro commands and functions. Store the name to the memory variable (or array element). The name can then be substituted into a command or function by enclosing the memory variable in parentheses.

**nested loop** – A loop contained within the body of another loop and executed repeatedly during each pass through the outer loop. See also: loop.

**network** – A collection of interconnected, individually controlled computers, together with the hardware and software used to connect them. A network allows users to share data and peripheral devices (such as printers and storage media), to exchange electronic mail, etc.

**non-modal** – A window or dialog that allows another window or dialog in front of it while that window or dialog is opened, for example, the Command window.

**NOT** – A unary logical operator that produces a true result if its operand is false, and a false result if its operand is true. See also: AND, OR

**non-compact single entry index** – Non-compact single entry index files should be created only if you need to maintain compatibility with older versions of FoxPro (prior to FoxPro 2.0) or if you're sharing data with FoxBASE+ and FoxBASE+/Mac.

**non-procedural** – You control the interface by manipulating objects. You don't need to type commands.

**null** – An undefined value. Null is different from zero; zero is a value just like other numbers, whereas null means no value at all (of the expected type). A null string does not contain anything. For example, " " is not a null string because it contains a space character; "" represents a null string.

**numeric field** – A field for numbers used in calculations such as quantities, prices and credit limits. It can include numbers, a decimal point and a leading plus or minus sign.

**numeric keypad** – A calculator-style keypad, either built-in or peripheral, which you can use to type numbers. The layout of numbers on the keypad makes it easier and faster to use than the regular keyboard.

**object level clause** – An @...GET clause defined for a specified object in a screen.

**object program** – The translated form of a program produced by a language translator, such as a compiler or assembler. It is also called object code. See also: source program.

**off line** – Not currently connected to or under the control of the computer. It is used to refer to equipment such as printers and disk drives, information storage media such as disks, and the information they contain. See also: on line.

**on line** – Currently connected to and under the control of the computer. Used to refer to equipment such as printers and disk drives, information storage media such as disks, and the information they contain. See also: off line.

**on-line help** – A mini-reference guide, accessible while using FoxPro, that provides additional information about FoxPro commands and functions.

**open** – To make available. You open files or documents so you can work with them.

**operand** – A value to which an operator is applied; the value on which an operation code operates. See also: argument.

**operating system** – A program that organizes the actions of the parts of the computer and its peripheral devices. See also: Disk Operating System.

**operator** – A symbol or sequence of characters, such as + or AND, specifying an operation to be performed on one or more values (the operands) to produce a result. See also: arithmetic operator, logical operator, relational operator, unary operator.

**optimize** – To cause something to work as effectively as possible. For example, optimizing an application means to use code that causes the application to run as quickly as possible in a given environment.

**option** – (1) Something chosen or available as a choice; for instance, an item on a menu popup. (2) An argument whose provision is optional.

**options** – A list of actions to choose from that are listed on a menu.

**optional character set** – An alternate character set that includes special symbols, foreign characters and accents.

**OR** – A logical operator that produces a true result if either or both of its operands are true, and a false result if both of its operands are false. See also: AND, NOT.

**orphaned** – Standing alone at the bottom of a page and separated from information on the next page.

**output** – Information transferred from a computer to some external destination such as the display screen, a disk drive, a printer, or a modem. See also: input.

**overflow** – The condition that exists when an attempt is made to put more data into a given memory area than it can hold; for example, a computational result that exceeds the allowed range.

**override** – To modify or cancel an instruction by issuing another one.

**overwrite mode** – A text editing mode in which any character you type replaces the text under the cursor.

**pack** – To permanently remove the records in a database that have been marked for deletion.

**page** – A window full of information.

**page down region** – The region on the scroll bar between the down arrow and the center of the bar. Clicking in this area causes a window to scroll through a full page of text at a time.

**page footer (PgFoot)** – An area that is printed at the bottom of every page of a report.

**page header (PgHead)** – An area that is printed at the top of every page of a report.

**page layout** – The Page Layout dialog contains all information about how a report is printed on paper. Top, bottom and side margins, as well as the number of rows per page, are all part of the page layout.

**page up region** – The region on the scroll bar between the up arrow and the center of the bar. Clicking in this area causes a window to scroll through a full page of text at a time.

**parallel printer** – A printer that accepts information from the computer by way of a parallel interface.

**parameter** – An argument that determines the outcome of a command.

**pass** – A single execution of a loop.

**pass by reference** – When a variable is passed to a user-defined function (UDF) by reference and the UDF changes the value of the passed variable, the variable's original value in the calling program *is* also changed.

**pass by value** – When a variable is passed to a user-defined function (UDF) by value, the variable's value may be changed by the procedure or UDF, but the variable's original value in the calling program is not changed.

**paste** – To place the contents of the clipboard at the insertion point.

**path name** – The full name by which an operating system identifies a file. A path name is a sequence of file names, each preceded by a slash, that specifies the path from device to directory to file that the operating system takes to locate that file. See also: file name.

**peripheral** – (adj) At or outside the boundaries of the computer itself, either physically (as a peripheral device) or logically (as a peripheral card). (n) Stands for peripheral device.

**peripheral device** – A piece of hardware such as a video monitor, disk drive, printer or modem used in conjunction with a computer and under the computer's control. Peripheral devices are often (but not necessarily) physically separate from the computer and connected to it by wires, cables or some other form of interface. Such devices often require peripheral cards.

**point** – (1) A unit of measurement for type; 12 points equal 1 pica, and 6 picas equal 1 inch; thus, 1 point equals approximately 1/72 inch. (2) To position the pointer at a location on the screen. Roll the mouse to place the pointer on an object.

**pointer** – (1) A small solid box or arrow on the screen that follows the movement of the mouse and shows where your next action will take place. (2) An item of information consisting of the memory address of some other item; for example, pointers to the most recently stored variable, the most recently typed program line, and the most recently read data item.

**point of call** – The point in a program from which a subroutine or function is called.

**popup** – The menu that appears when you choose a popup control in a dialog.

**popup control** – A rectangle with double lines on the right and bottom edges that you can choose to display the associated menu popup.

**position** – To place the cursor at a desired location in a window or dialog.

**precedence** – The prioritized order in which operators are applied in evaluating an expression.

**press** – To strike a key and then release it; you hold a key down only if you want to repeat a character or if you are using a modifier key with another key.

**printer** – A device that produces a copy on paper of the text or graphics you create using your computer.

**printer port** – A socket on the back panel of your computer that acts as a connection to a printer.

**procedure** – A set of instructions that work as a unit. It is the same as a subroutine.

**processor** – The hardware component of a computer that performs the actual computation by directly executing instructions represented in machine language and stored in main memory. See also: microprocessor.

**program** – (n) A set of instructions describing actions for a computer to perform in order to accomplish some task, conforming to the rules and conventions of a particular programming language. (v) To write a program.

**program line** – The basic unit of a program, consisting of one or more statements.

**programming language** – A set of symbols and associated rules or conventions for writing programs.

**project** – A project is a special database file that keeps track of all programs, screens, menus, libraries, reports, labels, queries, format files and other types of files that are needed to create an application.

**projection list** – In the SQL SELECT command, the projection list is the list of database fields, constants and expressions to appear in the query output.

**prompt** – A message on the screen that tells you of some need for response or action. A prompt usually takes the form of a symbol, a message, a dialog box or a menu of choices.

**push buttons** – Key words enclosed in angle brackets. The action associated with a push button occurs immediately when you choose a push button unless the it contains an ellipsis (...). The ellipsis indicates that another dialog will appear.

**queue** – A list in which entries are added at one end and removed at the other, causing entries to be removed in first-in, first-out (FIFO) order.

**query** – A question posed to obtain information. In FoxPro, RQBE and the SQL SELECT command can be used to query databases.



**radio button** – A set of parentheses followed by text. Radio buttons are grouped so that only one can be chosen at a time, like the buttons on a car radio. Choose a radio button to activate it. When a radio button is chosen, a bullet appears in the parentheses and any previously chosen radio button becomes deselected.

**random-access memory (RAM)** – Memory in which information can be referred to in an arbitrary or random order. As an analogy, a book is a random-access storage device because it can be opened and read at any point. RAM usually means the part of memory available for programs from a disk; the programs and other data are lost when the computer is turned off. A computer with 512K RAM has 512 kilobytes available to the user. (Technically, the read-only memory (ROM) is also random access, and what's called RAM should correctly be termed read-write memory.) See also: read-only memory, read-write memory.

**read** – To transfer information into the computer's memory from an external source (such as a disk drive or modem) or into the computer's processor from an external source (such as the keyboard or main memory).

**READ level clause** – A READ clause defined for a specific screen.

**read-only memory (ROM)** – Memory whose contents can be read, but not changed; used for storing firmware. Information is placed into read-only memory once, during manufacture; it then remains there permanently, even when the computer's power is turned off. See also: random-access memory, read-write memory.

**read-write memory** – Memory whose contents can be both read and changed. The information contained in read-write memory is erased when the computer's power is turned off and is permanently lost unless it has been saved on a disk or other storage device. See also: random-access memory, read-only memory.

**record** – A unit of storage in a database file. Every database file can contain a large number of records; each record is comprised of fields.

**record length** – The length of a database file's records, in bytes.

**recursion** – The continued repeating of an operation or a group of operations. A recursive procedure or function is one that, while running, calls itself.

**related database** – A database that is linked to the controlling database.

**relation** – The link between databases that allows data to be accessed from more than the currently SELECTed database. The link is based on a common field or a value (record number).

**relational expression** – An expression that describes a link between two databases based on a common field or value.

**relational operator** – An operator, such as > (greater than), that manipulates numeric and other types of values to produce a logical result. See also: arithmetic operator, logical operator.

**report detail band** – The area between the page header and the page footer, consisting of detail lines based on the records from the selected database(s).

**report footer band** – A band in the Report Layout window that contains the data that will appear at the bottom of a page (page numbers, section, etc.).

**report header band** – A band in the Report Layout window that contains information that appears once per page. Typically, items placed in a page header include a report title, column headings and current date.

**report object** – Graphic, field or text object in the Report Layout window.

**reserved word** – A word or sequence of characters reserved by FoxPro for some special use and therefore unavailable as a variable name in a program.

**return address** – The point in a program to which control returns on completion of a subroutine or function.

**return values** – The value returned by a function to the calling program. A function returns a value. The DATE() function returns the system date from your computer. Functions contain a pair of parentheses that distinguish them from commands.

**routine** – A part of a program that accomplishes some task subordinate to the overall task of the program. See also: procedure.

**row** – A horizontal arrangement of character cells on the screen or printer. See also: column.

**RQBE** – An acronym for Relational Query By Example. See also: query.

**run** – (1) To execute a program. When a program runs, the computer performs the instructions. (2) To load a program into main memory from a peripheral storage medium, such as a disk, and execute it.

**RUN** – A FoxPro command that brings an external program into memory and runs it.

**save** – To store information by transferring the information from main memory to a disk. Work that is not saved disappears when you turn off the computer or when the power is interrupted.

**scientific notation** – A method of expressing numbers in terms of powers of ten, useful for expressing very small or very large numbers. For example, 6.02E23 means 6.02 times ten to the 23rd power. (The letter E stands for exponent.) The number is easier to understand in this form.

**screen set** – Two or more screens in a file.

**scroll** – To move through the contents of a window or scrollable list (in a dialog) so that a different part becomes visible.

**scroll bars** – The controls that are used to view text that extends beyond the edge of a window. A window may have a vertical and/or horizontal scroll bar.

**scrollable list** – A list of the subdirectories and files under a common parent directory. The parent directory always appears at the top of the list.

**select** – (1) To designate where the next action will take place. To select using a mouse, you click on or drag across information. You can also select menu items by typing a letter or number at a prompt, by using a combination key press, or by using arrow keys. (2) To highlight. Selecting prepares something to be chosen.

**selection** – The information or items that will be affected by the next command. A selection usually appears highlighted.

**selection marquee** – Multiple objects can also be selected with the *selection marquee*. The selection marquee appears as a dotted line in the Screen Design window. All objects enclosed in the marquee are selected. Objects that are partially contained in the marquee are selected as well.

**serial printer** – A printer that accepts information from the computer by way of a serial interface.

**setup code** – Setup code is executed before the menu system is defined and may include code to open files, declare memory variables, or place the previous menu system on a stack so it can be retrieved later without redefining it.

**Shift-click** – A technique that allows you to extend or shorten a selection. Position the pointer at the end of what you want to select and hold down the Shift key while clicking the mouse button.

**Shift key** – A key that, when pressed, causes the subsequent letter you type to appear in upper-case, or the top symbol on a two-character key to appear.

**shortcut** – You can use a Control key combination as a shortcut to choose a menu option without displaying the menu popup.

**size control** – Control found on windows that allows you to change the window size a little at a time.

**software** – A collective term for programs, the instructions that tell the computer what to do. Software is usually stored on disks.

**source** – The original, as opposed to the duplicate (see also: destination). When you are making a copy of a file, the source is the location you are copying from.

**source program** – The form of a program given to a language translator, such as a compiler or an assembler, for conversion into another form. It is sometimes called source code. See also: object program.

**Spacebar** – The long, unlabeled bar along the bottom of the keyboard that you press to generate a space character.

**space character** – A text character whose printed representation is a blank space. You generate this character when you press the Spacebar.

**starting value** – The value assigned to the index variable on the first pass through a loop.

**start up** – To get the system running. Starting up is the process of first reading an operating system program from the disk and then running an application program.

**string** – An item of information consisting of a sequence of text characters.

**string literals** – A string literal is a character string surrounded by single or double quotation mark. For example, "Ohio" or 'Ohio'.

**structural compound index** – A structural compound index file, is created when you include TAG <tag name> without including the optional OF <.cdx file> clause. Structural CDX files always have the same base name as the database. A structural compound index file is automatically opened every time the database is opened.

**style** – A variation of a font, such as italic, underline, shadow or outline.

**subdirectory** – A directory within a directory; a file containing the names and locations of other files.

**subroutine** – A part of a program that can be executed on request from another point in the program and that returns control, on completion, to the point of the request.

**subscript** – An index number used to identify a particular element of an array.

**substring** – A string that is part of another string.

**sum** – An internal computation that returns the additive sum of the values for the named field or expression.

**summary band** – An area of the report that appears once, at the end of a report.

**syntax** – (1) The rules governing the structure of statements or instructions in a programming language. (2) A representation of a command that specifies all the possible forms the command can take.

**system** – A coordinated collection of interrelated and interacting parts organized to perform some function or achieve some purpose. A computer system might consist of a processor, keyboard, monitor and disk drive.

**system messages** – The boxes that appear in upper right corner of the screen to present information.

**system program** – A program that makes the resources and capabilities of the computer available for general purposes, such as an operating system or a language translator. See also: application program.

**system software** – The component of a computer system that supports application programs by managing system resources such as memory and I/O devices.

**tab** – (1) Stands for tabulator on typewriter keyboards. The Tab key allows you to set automatic stops (tab stops) or margins for columns, useful in tables. (2) An ASCII character that commands a device such as a printer to start printing at a preset location (called a tab stop). There are two such characters: horizontal tab (hex 09) and vertical tab (hex 0B). The horizontal tab character performs the same action as pressing the Tab key on a typewriter.

**Tab key** – A key that, when pressed, generates the tab character. The key's function is to move the insertion point or cursor to the next tab marker or to move the cursor to the next position in a dialog. The Tab key works essentially like a typewriter Tab key.

**tags** – Any of the separate index entries contained in a compound index file.

**tagging** – When you select the file(s) that an operation will affect, it is called tagging. A tagged file appears in the list with a triangle to the left of its name. You can tag files individually or in groups.

**template** – A predefined set of instructions designed to create a FoxPro program to perform a specific task.

**text** – (1) Information presented in the form of readable characters. (2) The display of characters on a display screen.

**text editor** – The part of FoxPro that allows you to create and modify text and program files.

**text file** – A file which contains information expressed in text form and whose contents are interpreted as characters encoded using the ASCII format. See also: binary file.

**text object** – Text in screens and reports. Text is usually used to convey information making the screen or report easier to use.

**text window** – A window in which text is displayed and scrolled.

**thumb** – A diamond shaped object in the scroll bar that indicates the relative position in the text. If you want to move through the text rapidly you can drag the thumb up and down.

**title** – The name that appears in the top portion of a window

**title band** – A report band that prints once at the beginning of the report.

**title bar** – A horizontal bar across the top of windows that displays the window title.

**Top-of-form command** – A command causing a printer to feed paper until the paper reaches a preset position relative to the top of a single sheet.

**trace** – Watch your code as it executes

**triple-click** – Press and release the mouse button three times in quick succession.

**triple-click drag** – To triple-click without releasing the mouse button on the third click, and continue to hold the button down while you drag.

**truncate** – (1) To shorten by discarding a part. (2) To convert a real number to the next lower integer.

**type-ahead buffer** – A buffer that accepts and holds characters that are typed faster than the computer can process them.

**unary operator** – An operator that applies to a single operand. For example, the minus sign (-) in a negative number such as -6 is a unary arithmetic operator.

**unconditional branch** – A branch whose execution does not depend on the truth of any condition. See also: conditional branch.

**unindexed database** – A database that does not have an index associated with it.

**unlock** – To remove the restriction on the use of a disk or a file so that it can once again be changed, deleted or renamed. See also: lock.

**user** – A person operating or controlling a computer system.

**user interface** – The rules and conventions by which a computer system communicates with the person operating it.

**utilities** – Programs which allow you to rename, copy, format, delete and otherwise manipulate files and volumes.

**utility screen** – Screens designed to be used multiple times throughout an application or in different applications. Utility screens are usually designed to be independent of the structure and context of a particular database.

**value** – An item of information, such as a number or a string, that can be stored in a variable.

**variable** – (1) A location in the computer's memory where a value can be stored. (2) The symbol used in a program to represent such a location. See also: constant.

**wildcard character** – A character that may be used to represent a sequence of characters in a pathname. A common wildcard character is the asterisk (\*). As an example, if you request a listing of \*.TXT files in a particular application, you would see a list of all files ending with the extension TXT.

**window** – (1) The area that displays information on the screen. You can open or close a window, move it around on the desktop, and sometimes change its size, scroll through it, and edit its contents. (2) The portion of a collection of information (such as a document, picture or worksheet) that is visible in a viewing area on the display screen.

**word wrap** – The automatic continuation of text from the end of one line to the beginning of the next, so that you don't have to press the Enter key at the end of each line as you type. If word wrap is set off, the text you type may extend beyond the edge of the window.

**work station** – An individual work area that includes one or more devices on a network.

**wrap around** – An option in the Find/Replace dialog that tells FoxPro to search for a specified string from your present cursor position to your current position, rather than stopping at the end of the file.

**write** – To transfer information from the computer to an external destination (such as a disk drive, printer or modem) or from the computer's processor to an external destination (such as main memory).



**zoom** – To enlarge a window until it fills the screen. When you zoom a window that already fills the screen, FoxPro shrinks it to its original size.

**zoom control** – A window control that you can use to make the window as big as the screen and to change it back again.



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