Getting Started

Microsoft FOXPRO

Relational Database Management System for MS-DOS®

Contents

More Reporting

In this session you'll learn to include formatted fields, functions and summary bands in your reports. This chapter begins on page G8-1.

RQBE and the Report Writer in Action

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In this session you'll learn to create your own database and add, delete and modify records. This chapter begins on page G10-1.

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In this session you'll learn to use FoxPro's powerful Screen Builder to design your own custom input screen. This chapter begins on page G11-1.

Generating an Application with FoxApp

In this session you'll generate an application using FoxApp. You'll also learn more about the Command window. This chapter begins on page G12-1.

Now What?

This section reviews what you've learned and directs you to other sources so you can continue to learn about FoxPro. This chapter begins on page G13-1.

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MS-DOS and FoxPro
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Greetings!

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

Greetings!

This book teaches you how to access the major features of FoxPro. In-depth explanations of the features are provided throughout the FoxPro documentation set.

Your first step is to install FoxPro. Installation instructions are located in the Installing FoxPro chapter of the FoxPro *Installation and Configuration* manual.

Using this manual, you will learn 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 — all with ease. You will also learn to create your own applications.

The Quick Tour chapter in this manual showcases FoxPro's features. During this tour, you will see many of FoxPro's tools for creating and manipulating data, and for quickly finding the information you need.

The Groundwork chapter begins a tutorial, which is designed for new FoxPro users as well as experienced users who want an introduction to the amazing new features of FoxPro.

The tutorial is divided, by chapter, into several short sessions. Each session focuses on one major topic and leads you through it step-by-step. The tutorial is designed to be easy to follow and, as you gain expertise, to act as a reference guide.

As you use FoxPro, remember these pointers:

- The context-sensitive online help system is at your fingertips — just press F1. Online help contains the most current information about FoxPro.

- If you have any problems, refer to the Product Support chapter in the FoxPro *Installation and Configuration* manual.

Introduction
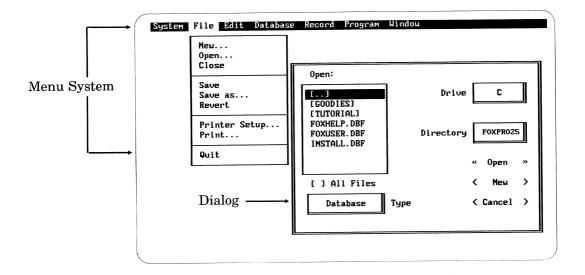
Quick Tour

Taking a Quick Tour

Take a look at the features that make FoxPro one of the most useful software packages.

Interface

Menu System

Dialog

```
System  File  Edit  Database  Record  Program  Window

        New...
        Open...
        Close               Open:

        Save                 [..]              Drive      C
        Save as...          [GOODIES]
        Revert              [TUTORIAL]
                            FOXHELP.DBF       Directory   FOXPRO25
        Printer Setup...    FOXUSER.DBF
        Print...            INSTALL.DBF
                                               «   Open   »
        Quit
                            [ ] All Files      <   New    >

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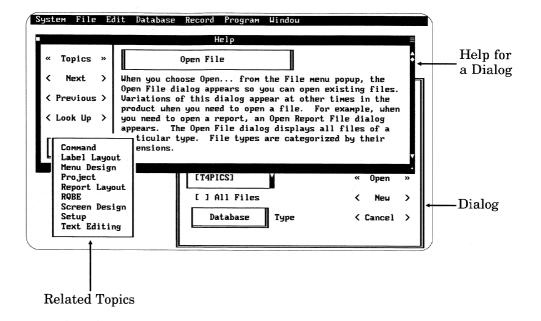
Welcome to a quick tour of FoxPro! During this tour you will see many of FoxPro's tools for managing your data. The tools help you easily create and manipulate your data, and quickly extract useful information.

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.

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

```
┌─────────────────────────────────────────────────────────────────────┐
│ System  File  Edit  Database  Record  Program  Window                 │
│  ┌──────────────────────────── Help ─────────────────────────────┐    │
│  █                                                                 ≡   │
│  │ «  Topics  »  ┌───────────── Open File ──────────────┐   ▲         │ ────► Help for
│  │               │                                      │   ◆         │       a Dialog
│  │ <   Next   >   When you choose Open... from the File menu popup, the  │
│  │                Open File dialog appears so you can open existing files.
│  │ < Previous >   Variations of this dialog appear at other times in the │
│  │                product when you need to open a file.  For example, when│
│  │ < Look Up  >   you need to open a report, an Open Report File dialog  │
│  │                appears.  The Open File dialog displays all files of a │
│  │            ┌───────────┐ticular type.  File types are categorized by their│
│  │          ┌─│ Command   │ensions.                           ▼         │
│  │          │ │ Label Layout                                            │
│  │            │ Menu Design                                             │
│  │            │ Project    │    ┌──────────────┐            «  Open  »  │
│  │            │ Report Layout│   │ [T4PICS]    ▼│                       │
│  │            │ RQBE        │    [ ] All Files           <   New   >    │
│  │            │ Screen Design                                          │ ────── Dialog
│  │            │ Setup       │    ┌──────────┐                <  Cancel >  │
│  │            │ Text Editing│    │ Database │ Type                      │
│  │            └───────────┘     └──────────┘                          │
│  │                                                                     │
│  └─────────────────────────────────────────────────────────────────┘ │
└───────────────────────────────────────────────────────────────────────┘
              │
              │
              ▼
      Related Topics
```

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. For example, if you ask for help while looking at a dialog, FoxPro tells you all about that particular dialog. Context-sensitive help is available for menu options and system windows as well.

FoxPro even provides a handy list of related help topics.

Browse Window

Fields

Records

Sale	Name	Notes	Ytdsales	City	Sta	Phone
117	Janet A. McCarthy	Memo	21427.27	East Hartford	CT	203/569-1
150	Robert Watters	Memo	24762.85	Waltham	MA	617/894-4
175	Doris Dupuy	Memo	20203.99	Fall River	MA	617/679-4
180	T Staziola Townsend	memo	7798.34	Burlington	MA	617/273-2
240	John Hodge	Memo	102797.63	Hermitage	PA	412/981-7
271	Howard Schneider	Memo	42181.43	Allentown	PA	215/432-3
281	Jay Kennedy	Memo	50521.98	New York	NY	212/246-5
294	Tom Caravello	Memo	69118.59	Mahwah	NJ	201/529-2
322	E. Faulkner	Memo	16004.70	Columbia	SC	803/776-8
328	Keith Sutherland	Memo	34088.44	Concord	NC	704/788-5
353	Jim Surbrook	Memo	27282.52	Gainesville	FL	904/392-2
360	Ned Hicks	Memo	49292.86	Savanah	GA	912/232-7
366	Robert Angelo	Memo	26737.83	Boca Raton	FL	305/994-8

SALESMAN

The Browse window is a wonderful tool for viewing and editing your data.

The Browse window usually displays your data in a tabular form called Browse mode. 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 the window 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.

Left Partition
in Browse Mode

Right Partition
in Change Mode

```
■                          SALESMAN                                      ≡
 Sale│Name             │Notes│ Salesman │117
                         ◆     Name      │Janet A. McCarthy
 117 │Janet A. McCarthy│Memo │ Notes     │Memo
 150 │Robert Watters   │Memo │ City      │East Hartford
 175 │Doris Dupuy      │Memo │ State     │CT
 180 │T Staziola Townsend│memo│ Ytdsales │ 21427.27
 240 │John Hodge       │Memo │ Phone     │203/569-1163
 271 │Howard Schneider │Memo │ Address   │1417 S Dearborn Circle
 281 │Jay Kennedy      │Memo │ Zip       │06118
 294 │Tom Caravello    │Memo ▼ Ono       │1
◄◆                              ►◆◆                                      ◆
```

```
■                          SALESMAN                                      ≡
 Sale│Name             │Notes│City          │Sta│Ytdsales │Phone        │Ad▲
 117 │Janet A. McCarthy│Memo │East Hartford │CT │ 21427.27│203/569-1163 │141
 150 │Robert Watters   │Memo │Waltham       │MA │ 24762.85│617/894-4332 │122
 175 │Doris Dupuy      │Memo │Fall River    │MA │ 20203.99│617/679-4071 │336
 180 │T Staziola Townsend│memo│Burlington   │MA │  7798.34│617/273-2904 │101
 240 │John Hodge       │Memo │Hermitage     │PA │102797.63│412/981-7562 │621
 271 │Howard Schneider │Memo │Allentown     │PA │ 48181.43│215/432-3022 │709
 281 │Jay Kennedy      │Memo │New York      │NY │ 50521.98│212/246-5348 │740
 294 │Tom Caravello    │Memo │Mahwah        │NJ │ 69118.59│201/529-2831 │482▼
◆◆◄◆                                                                    ►
```

Browse
Window

```
                       SALESMAN.NOTES
 Janet has been salesperson of the month for one consecutive month!
```

Memo
Window

The Browse window allows you to view your data in Browse mode (tabular form) or in Change mode.

The Browse window can also 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.

The Browse windows above show a 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.

RQBE Window

```
┌─────────────────────── RQBE - SAMPLE ─────────────────────────┐
│   Databases        Output Fields                  Output To    │
│  ┌──────────┐  ┌─────────────┐                 ┌────────────┐  │
│  │ CUSTOMER │  │ ↕ 1↑ NAME   │  [X] Select Fields...│ Browse │║ │
│  │ INVOICES │  │ ↕ 2↓ ITOTAL │                 └────────────┘  │
│  │▶SALESMAN │  │ ↕    COMPANY│  [X] Order By...               │
│  └──────────┘  │ ↕    CONTACT│                 [ ] Options... │
│   < Add  >     │ ↕    PHONE  │  [ ] Group By...               │
│   < Clear >    │ ↕           │  [ ] Having...    < See SQL >  │
│                └─────────────┘                  « Do Query »  │
│  ──────────────────────────────────────────────────────────  │
│    Field Name          NOT           Example      Options  Select│
│  ┌────────────────────────────────────────────────────┐  Criteria│
│  │↕ INVOICES.CNO     [ ] Like     CUSTOMER.CNO    [ ] │        │
│  │↕ SALESMAN.ONO     [ ] Like     CUSTOMER.ONO    [ ] │ <Insert>│
│  │↕ INVOICES.ITOTAL  [ ] More Than 2500           [ ] │        │
│  │                                                     │ <Remove>│
│  │                                                     │        │
│  │                                                     │ <  Or  >│
│  └────────────────────────────────────────────────────┘        │
└────────────────────────────────────────────────────────────────┘
```
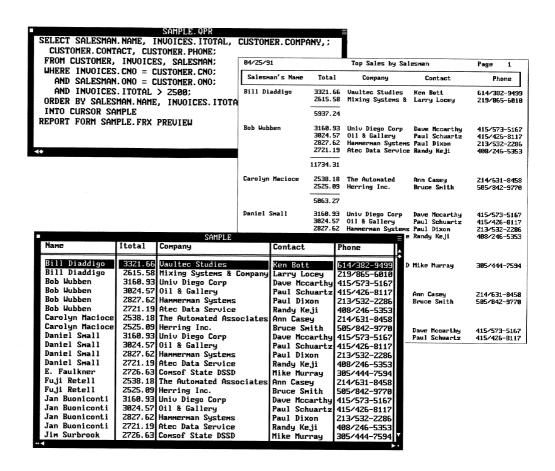
RQBE stands for *Relational Query By Example.* RQBE allows you
to look at your data from many different angles. Its ease of use
and quick response time make RQBE an excellent tool for "what if"
analysis.

Using the same simple interface that you've seen so far, FoxPro
allows you to choose databases from which to retrieve information.
You can then select the fields you want to display. You can
specify the order of the fields 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;    │ 04/25/91              Top Sales by Salesman          Page   1  │
│    AND SALESMAN.ONO = CUSTOMER.ONO;    │ ┌────────────────┬───────┬─────────────────┬──────────────┬──────────┐
│    AND INVOICES.ITOTAL > 2500;         │ │ Salesman's Name │ Total │     Company     │   Contact    │  Phone   │
│  ORDER BY SALESMAN.NAME, INVOICES.ITOTA│ └────────────────┴───────┴─────────────────┴──────────────┴──────────┘
│  INTO CURSOR SAMPLE                    │  Bill Diaddigo      3321.66  Vaultec Studies    Ken Bott      614/382-9499
│ REPORT FORM SAMPLE.FRX PREVIEW         │                     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
┌■──────────────────────SAMPLE──────────────────────≡┐         │                     2721.19  e             Randy Keji    408/246-5353
│ Name        │Itotal │Company            │Contact    │Phone    │
│─────────────┼───────┼───────────────────┼───────────┼─────────│           D Mike Murray          305/444-7594
│ Bill Diaddigo│3321.66│Vaultec Studies    │Ken Bott   │614/382-9499│
│ Bill Diaddigo│2615.58│Mixing Systems & Company│Larry Locey│219/865-6010│
│ Bob Wubben  │3160.93│Univ Diego Corp    │Dave Mccarthy│415/573-5167│        Ann Casey          214/631-8458
│ Bob Wubben  │3024.57│Oil & Gallery      │Paul Schuartz│415/426-8117│       Bruce Smith        505/842-9770
│ Bob Wubben  │2827.62│Hammerman Systems  │Paul Dixon │213/532-2286│
│ Bob Wubben  │2721.19│Atec Data Service  │Randy Keji │408/246-5353│
│ Carolyn Macioce│2538.18│The Automated Associates│Ann Casey│214/631-8458│   Dave Mccarthy      415/573-5167
│ Carolyn Macioce│2525.09│Herring Inc.     │Bruce Smith│505/842-9770│        Paul Schuartz     415/426-8117
│ Daniel Small│3160.93│Univ Diego Corp    │Dave Mccarthy│415/573-5167│
│ Daniel Small│3024.57│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 Keji │408/246-5353│
│ E. Faulkner │2726.63│Comsof State DSSD  │Mike Murray│305/444-7594│
│ Fuji Retell │2538.18│The Automated Associates│Ann Casey│214/631-8458│
│ Fuji Retell │2525.09│Herring Inc.       │Bruce Smith│505/842-9770│
│ Jan Buoniconti│3160.93│Univ Diego Corp  │Dave Mccarthy│415/573-5167│
│ Jan Buoniconti│3024.57│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 Keji │408/246-5353│
│ Jim Surbrook│2726.63│Comsof State DSSD  │Mike Murray│305/444-7594│
│◆◀                                                  ▶•│
└──────────────────────────────────────────────────────┘
```
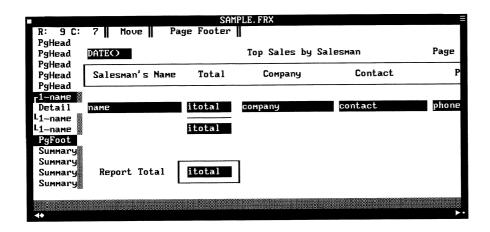
You can choose to send data from RQBE to a Browse window. This
allows you to use all of the powerful features available with
Browse windows.

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 stop of this tour.

Programmers will be interested to know that, 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

```
█                              SAMPLE.FRX                              ≡
 R:  9 C:  7 ‖  Move ‖   Page Footer ‖
 PgHead
 PgHead    DATE()                      Top Sales by Salesman          Page
 PgHead
 PgHead    Salesman's Name    Total       Company        Contact        P
 PgHead
 ┌1-name
  Detail   name              itotal   company         contact        phone
 └1-name
 └1-name                      itotal
  PgFoot
  Summary
  Summary
  Summary      Report Total   itotal
  Summary

 ◄◊                                                                    ►•
```

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 reports.

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.

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	617/662-0157	Darryl Roudebush	Melrose	MA
A. Bloomington Biz	904/222-9457	Phil Putnam	Tallahassee	FL
AZ Inc	617/823-5180	Tom Totah	Taunton	MA
Abbymark Velonex	214/922-4927	Isador Sweet	Dallas	TX
Acres Tree Solutions	201/786-0785	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 Carturight	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
Ansari Data Soft				
Ansari Produce				
Applied Telephon				
Aspen Planning &				
Aspen Technology				
Assoc American C				
Assoc Strong				
Atec Data Servic				
Automated Mayo M				
Award Ammonia Gr				
Azimuth Bavis &				
Azimuth Corp				
B-J Astra				
Balance Computin				
Battery Weaver				
Bechtel's Depart				

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			
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#  LV8804-3
│  Price        49.95                      Comments
│  Acquired  10/11/90   Sides      5       ┌─────────────────────────┐
│  V.Quality 8          Duration   255     │This is a good movie.    │
│  Critics   7          Year       1977    │                         │
│                                          │                         │
│                                          └─────────────────────────┘
│   ┌─────────────┐
│   │   NC-17     │   Rating
│   └─────────────┘           [X] Digital transfer  [ ] CAV format
│                             [ ] Digital audio     [ ] Black and white
│   ┌─────────────┐           [ ] Stereo            [ ] Subtitled
│   │  Paramount  │   Studio   [ ] Surround sound    [ ] Dubbed
│   └─────────────┘           [X] CX encoded        [ ] Silent
│   ┌─────────────┐           [ ] Closed captioned  [ ] Commentary
│   │   Title     │   Order    [ ] Letterboxed       [ ] Supplements
│   └─────────────┘
│
│     < Top   >   < Prior  >   < Next  >   < Bottom >   < Quit  >
└──────────────────────────────────────────────────────────────────┘
```
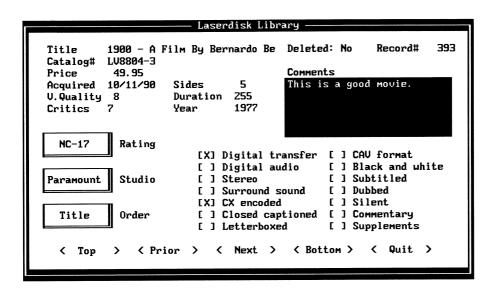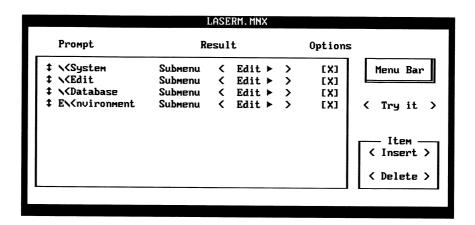
FoxPro's Screen Builder allows you to design screens for entering and editing your data.

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.
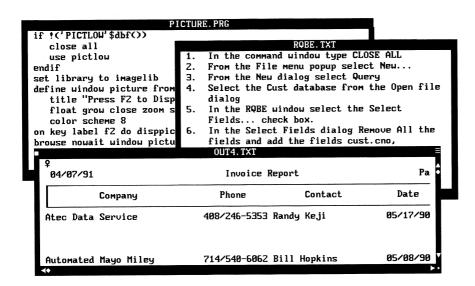
Menu Builder

```
                            LASERM.MNX
    Prompt                Result              Options

  ↕ \<System       Submenu    < Edit ▶ >      [X]      ┌─────────────┐
  ↕ \<Edit         Submenu    < Edit ▶ >      [X]      │  Menu Bar   │
  ↕ \<Database     Submenu    < Edit ▶ >      [X]      └─────────────┘
  ↕ E\<nvironment  Submenu    < Edit ▶ >      [X]      <  Try it  >

                                                     ┌─── Item ───┐
                                                     │ < Insert > │
                                                     │            │
                                                     │ < Delete > │
                                                     └────────────┘
```

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

```
                        PICTURE.PRG
if !('PICTLOW'$dbf())
   close all
   use pictlow                        RQBE.TXT
endif                        1.  In the command window type CLOSE ALL
set library to imagelib      2.  From the File menu popup select New...
define window picture from   3.  From the New dialog select Query
   title "Press F2 to Disp   4.  Select the Cust database from the Open file
   float grow close zoom s       dialog
   color scheme 8            5.  In the RQBE window select the Select
on key label f2 do disppic       Fields... check box.
browse nowait window pictu   6.  In the Select Fields dialog Remove All the
                                 fields and add the fields cust.cno,
                                  OUT4.TXT
  ♀
  04/07/91                          Invoice Report                    Pa

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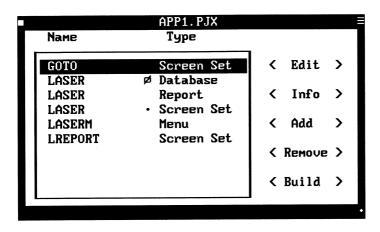
FoxPro's Trace window allows you to watch program code as it executes. You can let your program execute normally, step through the code one line at a time, or set breakpoints to stop execution on certain lines.

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.

The Text Editor, Trace and Debug windows are an unbeatable team for program development.

Project Manager

```
┌─────────────────────────────────────────────────┐
│ ■               APP1.PJX                       ≡ │
│    Name                Type                       │
│   ┌──────────────────────────────┐               │
│   │ GOTO            Screen Set    │  ‹  Edit  ›   │
│   │ LASER         ⌀ Database      │               │
│   │ LASER           Report        │  ‹  Info  ›   │
│   │ LASER         • Screen Set    │               │
│   │ LASERM          Menu          │  ‹  Add   ›   │
│   │ LREPORT         Screen Set    │               │
│   │                               │  ‹ Remove ›   │
│   │                               │               │
│   │                               │  ‹ Build  ›   │
│   │                               │               │
│   └──────────────────────────────┘               │
└─────────────────────────────────────────────────┘
```

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 management system of remarkable breadth and depth. Beginners can simply and swiftly tap FoxPro's 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.

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
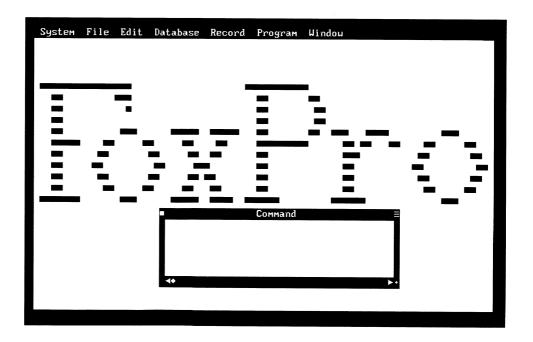
This chapter familiarizes you with the FoxPro interface. If you need more information about the interface, refer to the Interface Basics chapter in the FoxPro *User's Guide*. The chapters following Groundwork show you how to use FoxPro's tools to enter, manipulate and report your data.

Starting FoxPro

Starting FoxPro

1. Turn on your computer.

2. If you have not installed FoxPro, follow the instructions in the Installing FoxPro chapter of the FoxPro *Installation and Configuration* manual.

3. Go to the directory in which you installed FoxPro. Although FoxPro can be installed on any drive, this tutorial assumes that FoxPro is installed on the C drive.

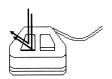4. Type FOX, then press Enter. The FoxPro sign-on screen appears with the Command window open.

System   File   Edit   Database   Record   Program   Window

Command

Mouse Techniques

Here are some common mouse techniques. For additional information about mouse use, refer to the Interface Basics chapter in the FoxPro *User's Guide*.
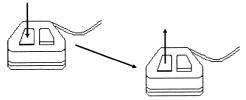
Point – Position the pointer at a specific location on the screen. When you move the mouse, the pointer moves in a similar manner.

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

Double-click – Point to an object then press and release the left mouse button twice in rapid succession.
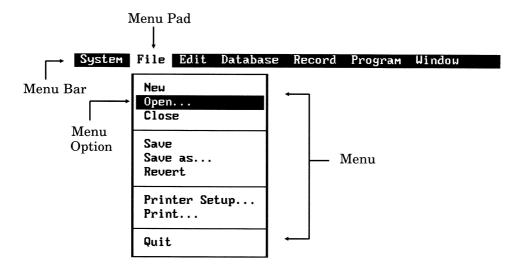
Drag – Hold the left mouse button down, roll the mouse until the pointer is in the desired location, then release the left mouse button.

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.

Menu Pad

| System | File | Edit   Database   Record   Program   Window |

Menu Bar

New
Open...
Close

Menu
Option

Save
Save as...
Revert

Menu

Printer Setup...
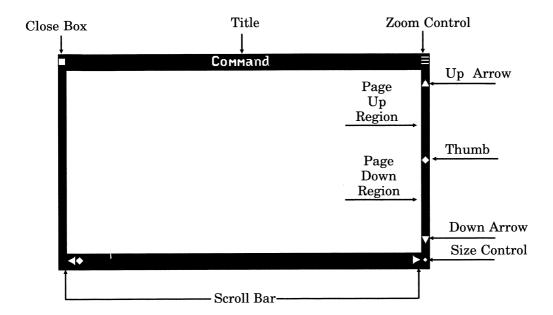Print...

Quit

Choosing Menu Options

With the keyboard:

1. Press the Alt key to select the first menu pad, then press the Right Arrow or Left Arrow key to select other menu pads on the menu bar.

2. Press Enter to display the menu.

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.

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.

Close Box   Title   Zoom Control

Command

Up Arrow

Page
Up
Region

Thumb

Page
Down
Region

Down Arrow

Size Control

Scroll Bar

Moving a Window

With the keyboard:

1. Choose **Move** from the **Window** menu. 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, then drag the window to the desired location.

Sizing a Window

With the keyboard:

- Choose **Size** from the **Window** menu. 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. 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 screen and the PgDn key to display the next screen of text.

With the mouse:
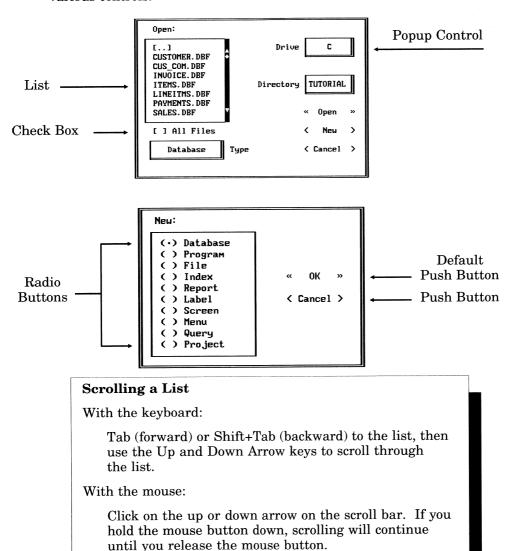
- Click on the up or down arrow on the scroll bar to move through the text a line at a time. Click on the Page Up or Page Down region to move through the text a screen at a time. Click and hold the mouse button down on the arrow to scroll continuously.

- To scroll rapidly, point to the *thumb* and drag it up or down.

Closing a Window

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

Dialogs

Dialogs are special boxes that allow you to make choices concerning an action about to take place. Following are some example dialogs with various controls.

```
┌─────────────────────────────────────────────────┐
│  Open:                                            │
│  ┌──────────────┐                  ┌─────────┐    │
│  │ [..]        ▲│      Drive       │    C    │    │
│  │ CUSTOMER.DBF ◆│                 └─────────┘    │
│  │ CUS_COM.DBF  ◆│                               │
│  │ INVOICE.DBF  │                  ┌──────────┐   │
│  │ ITEMS.DBF    │   Directory      │ TUTORIAL │   │
│  │ LINEITMS.DBF │                  └──────────┘   │
│  │ PAYMENTS.DBF │                                 │
│  │ SALES.DBF   ▼│             «   Open   »        │
│  └──────────────┘                                 │
│  [ ] All Files                   <   New    >     │
│  ┌──────────────┐                               │
│  │   Database   │  Type           < Cancel >      │
│  └──────────────┘                                 │
└─────────────────────────────────────────────────┘
```

List ⟶

Check Box ⟶

Popup Control ⟵

```
┌─────────────────────────────────────────────────┐
│  New:                                             │
│  ┌──────────────┐                                 │
│  │ (·) Database │                                 │
│  │ ( ) Program  │                                 │
│  │ ( ) File     │                                 │
│  │ ( ) Index    │        «   OK   »               │
│  │ ( ) Report   │                                 │
│  │ ( ) Label    │        < Cancel >               │
│  │ ( ) Screen   │                                 │
│  │ ( ) Menu     │                                 │
│  │ ( ) Query    │                                 │
│  │ ( ) Project  │                                 │
│  └──────────────┘                                 │
└─────────────────────────────────────────────────┘
```

Radio Buttons ⟶

Default Push Button ⟵

Push Button ⟵

Scrolling a List

With the keyboard:

Tab (forward) or Shift+Tab (backward) to the list, then use the Up and Down Arrow keys to scroll through 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.

To scroll rapidly, point to the thumb and drag it up or down.

Choosing an Option on a Popup

With the keyboard:

1. Tab or Shift+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 left mouse button to display the popup.

2. Drag to the desired option.

Choosing a Check Box, Radio Button, Push Button

With the keyboard:

Tab or Shift+Tab to the check box, radio button or push button, then press Enter. To choose the default push button (button enclosed in double angle brackets) from anywhere in the dialog, press Ctrl+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 and 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.

Online Help

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 is displayed, press the F1 key.

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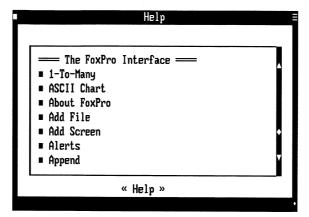
Hold down the Alt key, point to the window, dialog or menu option and click the left mouse button.

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

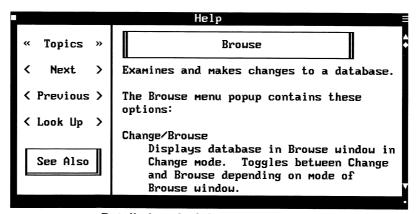**Getting Help Details for a Topic**

1. Choose **Help...** from the **System** menu 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.

```
┌──────────────────────────────────────────────┐
│■                       Help                  ≡│
│  ┌──────────────────────────────────────────┐ │
│  │ ═══ The FoxPro Interface ═══           ▲ │ │
│  │ ■ 1-To-Many                              │ │
│  │ ■ ASCII Chart                            │ │
│  │ ■ About FoxPro                           │ │
│  │ ■ Add File                               │ │
│  │ ■ Add Screen                           ◆ │ │
│  │ ■ Alerts                                 │ │
│  │ ■ Append                               ▼ │ │
│  └──────────────────────────────────────────┘ │
│              « Help »                          │
│                                              ◆ │
└──────────────────────────────────────────────┘
```

Topics Level of the Help Window

```
┌──────────────────────────────────────────────────┐
│■                        Help                      ≡│
│ ┌─────────────┐ ┌───────────────────────────────┐▲│
│ │ «  Topics » │ │           Browse            ‖ │◆│
│ │             │ └───────────────────────────────┘ │
│ │ <  Next   > │  Examines and makes changes to a database.│
│ │             │                                   │
│ │ < Previous >│  The Browse menu popup contains these │
│ │             │  options:                         │
│ │ < Look Up  >│                                    │
│ │             │  Change/Browse                    │
│ │ ┌─────────┐ │      Displays database in Browse window in│
│ │ │See Also ‖ │      Change mode.  Toggles between Change│
│ │ └─────────┘ │      and Browse depending on mode of│
│ │             │      Browse 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 the keyboard.

Cursor Movement	
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

Select Text with Keyboard	
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

Select Text with Mouse	
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

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

Cut, Copy and Paste	
Select the text, press Ctrl+X or use **Cut** on the **Edit** menu	Cut text
Select the text, press Ctrl+C or use **Copy** on the **Edit** menu	Copy text
Press Ctrl+V or use **Paste** on the **Edit** menu	Paste at cursor
Select text, press Ctrl+V or use **Paste** on the **Edit** menu	Replace text with clipboard content

Exiting FoxPro

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

Viewing Data

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.

Looking at Your Data

Now that you can navigate in 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 fictitious customers. This is one of six sample databases provided that relate to the operations of an 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. The Open File dialog appears. If you've installed FoxPro on the C drive, make sure that **C** shows on the **Drive** popup control. Be sure that **TUTORIAL** shows on the **Directory** popup control. (Figure 1)
>
> 2. Make sure **Database** appears on the **Type** popup control then select CUSTOMER.DBF.
>
> 3. Choose the **Open** push button.
>
> 4. Choose **Browse** from the **Database** menu. The Browse window appears as in Figure 2.

As you can see in Figure 3, 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.
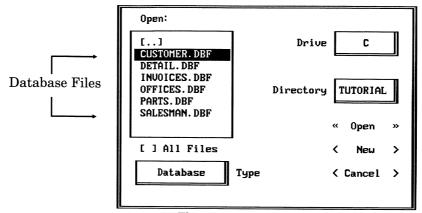
Figure 1: Open File Dialog
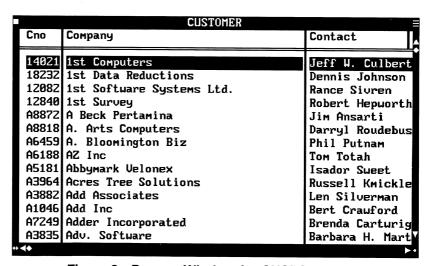
Figure 2: Browse Window for CUSTOMER.DBF

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.

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.

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

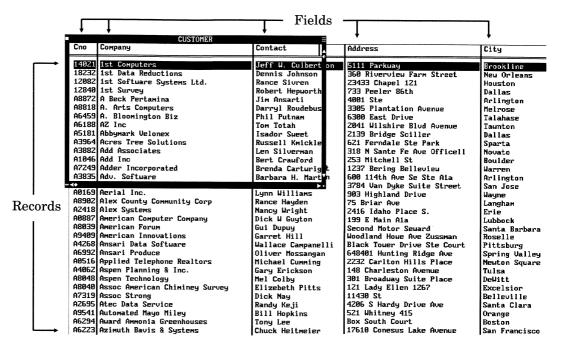| CUSTOMER				
Cno	Company	Contact	Address	City
14021	1st Computers	Jeff W. Culbertson	5111 Parkway	Brookline
18232	1st Data Reductions	Dennis Johnson	360 Riverview Farm Street	New Orleans
12082	1st Software Systems Ltd.	Rance Sivren	23433 Chapel 121	Houston
12840	1st Survey	Robert Hepworth	733 Peeler 86th	Dallas
A8872	A Beck Pertamina	Jim Ansarti	4001 Ste	Arlington
A8818	A. Arts Computers	Darryl Roudebus	3305 Plantation Avenue	Melrose
A6459	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 Kmickle	621 Ferndale Ste Park	Sparta
A3882	Add Associates	Len Silverman	318 N Sante Fe Ave Officell	Novato
A1046	Add Inc	Bert Crawford	253 Mitchell St	Boulder
A7249	Adder Incorporated	Brenda Carturight	1237 Bering Belleview	Warren
A3835	Adv. Software	Barbara H. Martyn	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
A0887	American Computer Company	Dick W Guyton	199 E Main A1a	Lubbock
A8039	American Forum	Gui Dupuy	Second Motor Seward	Santa Barbara
A9409	American Innovations	Garret Hill	Woodland Houe 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
A8048	Aspen Technology	Mel Colby	301 Broadway Suite Place	DeWitt
A8040	Assoc American Chiminey Survey	Elizebeth Pitts	121 Lady Ellen 1267	Excelsior
A7319	Assoc Strong	Dick Nay	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	Azimuth 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 can 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. A field is selected when it is highlighted or when the cursor appears in that field. Choose **Size Field** from the **Browse** menu.

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.

```
┌─────────────────────────────────────────────────────────────────────────┐
│ ■                              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 Hepworth   │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 Velonex               │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 Crawford     │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 Stree│
│ │12082│1st Software Systems Ltd.  │Rance Sivren      │23433 Chapel 121 │  │
│ │12840│1st Survey                 │Robert Hepworth   │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 Velonex           │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 Offic│ │
│ │A1046│Add Inc                    │Bert Crawford     │253 Mitchell St  │  │
│ │A7249│Adder Incorporated         │Brenda Carturight │1237 Bering Belleview│ │
│ │A3835│Adv. Software              │Barbara H. Martin │600 114th Ave Se A1a│▼│ │
│ ↔◀◆                                                                 ▶• │
└─────────────────────────────────────────────────────────────────────────┘
```
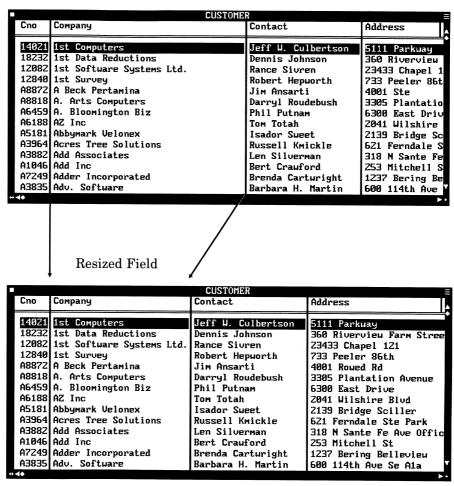
Figure 4: Browse Window with Field Resized

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. You can use Shift+Tab to move from field to field in reverse order. Choose **Move Field** from the **Browse** menu.
>
> 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 Stree│
│ │12082 │1st Software Systems Ltd.│Rance Sivren          │23433 Chapel 121  │
│ │12840 │1st Survey             │Robert Hepworth       │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 Velonex       │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 Offic│
│ │A1046 │Add Inc                │Bert Crawford         │253 Mitchell St   │
│ │A7249 │Adder Incorporated     │Brenda Carturight     │1237 Bering Belleview│
│ │A3835 │Adv. Software          │Barbara H. Martin     │600 114th Ave Se A1a▼│
│ ↔◄◆                                                                  ►• │
└─────────────────────────────────────────────────────────────────────────┘
```

Moved Field

```
┌─────────────────────────────────────────────────────────────────────────┐
│ ■                              CUSTOMER                                ≡ │
│ ┌───────────────────────┬──────┬──────────────────────┬──────────────┐▲ │
│ │ Company               │ Cno  │ Contact              │ Address      │◆ │
│ ├───────────────────────┼──────┼──────────────────────┼──────────────┤  │
│ │1st Computers          │14021 │Jeff W. Culbertson    │5111 Parkway      │
│ │1st Data Reductions    │18232 │Dennis Johnson        │360 Riverview Farm Stree│
│ │1st Software Systems Ltd.│12082 │Rance Sivren          │23433 Chapel 121  │
│ │1st Survey             │12840 │Robert Hepworth       │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 Velonex       │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 Offic│
│ │Add Inc                │A1046 │Bert Crawford         │253 Mitchell St   │
│ │Adder Incorporated     │A7249 │Brenda Carturight     │1237 Bering Belleview│
│ │Adv. Software          │A3835 │Barbara H. Martin     │600 114th Ave Se A1a▼│
│ ↔◄◆                                                                  ►• │
└─────────────────────────────────────────────────────────────────────────┘
```
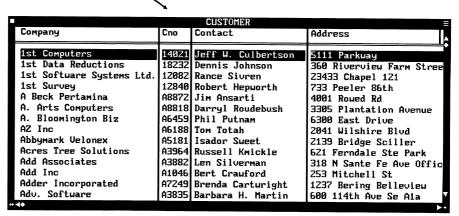
Figure 5: Browse Window with Field Moved

We want to see all of the fields at the same time. 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. 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.

```
┌─────────────────────────────────────────────────────────────┐
│■                          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                                             │
├───────────────────────────────────────────────────────────── │
│ Company  1st Data Reductions                                  │
│ Cno      18232                                               ▼│
│ Contact  Dennis Johnson                                      •│
└─────────────────────────────────────────────────────────────┘
```
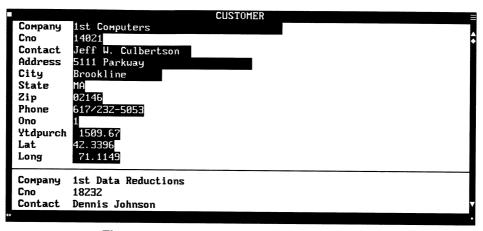
Figure 6: Browse Window in Change Mode

Another useful way to look at data is to split the Browse window into two partitions. Now you can use the 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, then press the Right Arrow key until you see two COMPANY fields then a second CNO field. When the window appears as shown in Figure 7, press Enter.

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)

Viewing Data

CUSTOMER				
Company	Cno	Company	Cno	Contac
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! In a split Browse window, 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.

2. Choose **Change** from the **Browse** menu, 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, 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.

Left Partition in Browse Mode   Right Partition in Change Mode

```
┌─────────────────────────────── CUSTOMER ──────────────────────────────────≡┐
│ ┌────────────────────────┬──────┐┌ Company   1st Computers                  │
│ │ Company                │ Cno  ││ Cno       14021                          │
│ ├────────────────────────┼──────┤│ Contact   Jeff W. Culbertson            │
│ │ 1st Computers          │14021 ││ Address   5111 Parkway                   │
│ │ 1st Data Reductions    │18232 ││ City      Brookline                      │
│ │ 1st Software Systems Ltd.│12082 ││ State     MA                            │
│ │ 1st Survey             │12840 ││ Zip       02146                          │
│ │ A Beck Pertamina       │A8872 ││ Phone     617/232-5053                   │
│ │ A. Arts Computers      │A8818 ││ Ono       1                              │
│ │ A. Bloomington Biz     │A6459 ││ Ytdpurch   1509.67                       │
│ │ AZ Inc                 │A6188 ││ Lat       42.3396                        │
│ │ Abbymark Velonex       │A5181 ││ Long       71.1149                       │
│ │ Acres Tree Solutions   │A3964 ││                                          │
│ │ Add Associates         │A3882 ││ Company   1st Data Reductions            │
│ │ Add Inc                │A1046 ││ Cno       18232                          │
│ │ Adder Incorporated     │A7249 ││ Contact   Dennis Johnson                 │
│ │ Adv. Software          │A3835 │▼                                          │
│ ◄►                        ►↔                                               •│
└─────────────────────────────────────────────────────────────────────────────┘
```

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, 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.

Left Partition in Browse Mode

Right Partition in Change Mode
(viewing different records)

```
■                                    CUSTOMER                                    ≡
 ┌─────────────────────────────┬───────┐ Long      122.5647
 │ Company                     │ Cno   │
 ├─────────────────────────────┼───────┤ Company   Add Inc
 │ 1st Computers               │ 14021 │ Cno       A1046
 │ 1st Data Reductions         │ 18232 │ Contact   Bert Crawford
 │ 1st Software Systems Ltd.   │ 12082 │ Address   253 Mitchell St
 │ 1st Survey                  │ 12840 │ City      Boulder
 │ A Beck Pertamina            │ A8872 │ State     CO
 │ A. Arts Computers           │ A8818 │ Zip       80303
 │ A. Bloomington Biz          │ A6459 │ Phone     303/499-2086
 │ AZ Inc                      │ A6188 │ Ono       5
 │ Abbymark Velonex            │ A5181 │ Ytdpurch    161.70
 │ Acres Tree Solutions        │ A3964 │ Lat       40.0233
 │ Add Associates              │ A3882 │ Long      105.2741
 │ Add Inc                     │ A1046 │
 │ Adder Incorporated          │ A7249 │
 │ Adv. Software               │ A3835 │ Company   Adder Incorporated
 └─────────────────────────────┴───────┘
```

Figure 10: Browse Window with Partitions Unlinked

Closing the Browse Window

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

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 salespeople at our sample business.

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

Browsing SALESMAN.DBF

1. Choose **Open...** from the **File** menu. 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. 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.

Viewing Data

```
┌─────────────────────────────────────────────────────────┐
│ ■                      Command                         ≡ │
├─────────────────────────────────────────────────────────┤
│ USE C:\FOXPRO25\TUTORIAL\CUSTOMER.DBF                     │
│ BROWSE LAST                                               │
│                                                           │
│                                                           │
│                                                           │
│ ◄◆                                                   ►•   │
└─────────────────────────────────────────────────────────┘
```
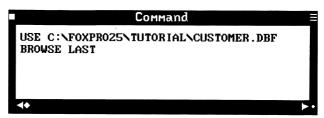
Figure 11: Commands Executed For You

Salesman	Ono	Notes	Name	Ytdsal
117	1	Memo	Janet A. McCarthy	21427.
150	1	Memo	Robert Watters	24762.
175	1	Memo	Doris Dupuy	20203.
180	1	memo	T Staziola Townsend	7798.
240	2	memo	John Hodge	102797.
271	2	memo	Howard Schneider	42181.
281	2	memo	Jay Kennedy	50521.
294	2	memo	Tom Caravello	69118.
322	3	memo	E. Faulkner	16004.
328	3	memo	Keith Sutherland	34088.
353	3	Memo	Jim Surbrook	27282.
360	3	Memo	Ned Hicks	49292.
366	3	Memo	Robert Angelo	26737.
391	3	Memo	Kim Baer	122106.

Figure 12: Browse Window for SALESMAN.DBF

In SALESMAN.DBF, you'll notice an 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 kind of information. Because this information can 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 a memo 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. From the **Window** menu, choose the name of the Browse window, SALESMAN, to make the Browse window active.

4. Position the cursor on the top record in the Browse window then 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. Position the cursor on the top record in the Browse window then scroll with the Up and Down Arrow *keys*.

In a memo field, the difference in capitalization tells you at a glance whether a particular memo field contains information. A capital "M" indicates that the memo field contains information and a lower-case "m" indicates that the memo field is empty.

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!"

Inactive Browse Window
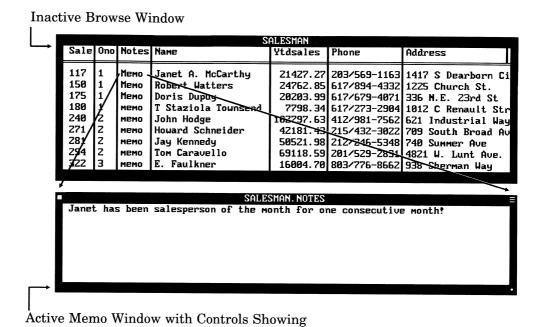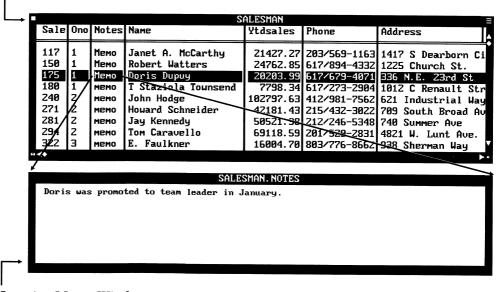
Sale	Ono	Notes	Name	Ytdsales	Phone	Address
117	1	Memo	Janet A. McCarthy	21427.27	203/569-1163	1417 S Dearborn Ci
150	1	Memo	Robert Watters	24762.85	617/894-4332	1225 Church St.
175	1	Memo	Doris Dupuy	20203.99	617/679-4071	336 N.E. 23rd St
180	1	memo	T Staziola Townsend	7798.34	617/273-2904	1012 C Renault Str
240	2	memo	John Hodge	102297.63	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

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

SALESMAN.NOTES

Doris was promoted to team leader in January.

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 and Memo Windows

With the keyboard:

    Choose **Close** from the **File** menu.

With the mouse:

    Click on the close box of the Browse window.

Exiting FoxPro

    Choose **Quit** from the **File** menu.

Retrieving Your Data

In this session, you'll learn to use the powerful RQBE window to query databases and gather specific information.

Querying

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 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. If you exited FoxPro, start FoxPro again. Otherwise, hold down Shift and choose **Close All** from the **File** menu.

2. Choose **New...** from the **File** menu.

3. In the New File dialog, choose the **Query** radio button (Figure 1), then choose **OK**.

   Notice that some of the letters in the New File dialog are highlighted. These letters are called hot keys. You can press the corresponding hot key instead of choosing a control. (For step 3, you could have pressed Q.) Hot keys are available all throughout the FoxPro interface.

4. In the Open File dialog, make sure **TUTORIAL** is showing on the **Directory** popup, select CUSTOMER.DBF
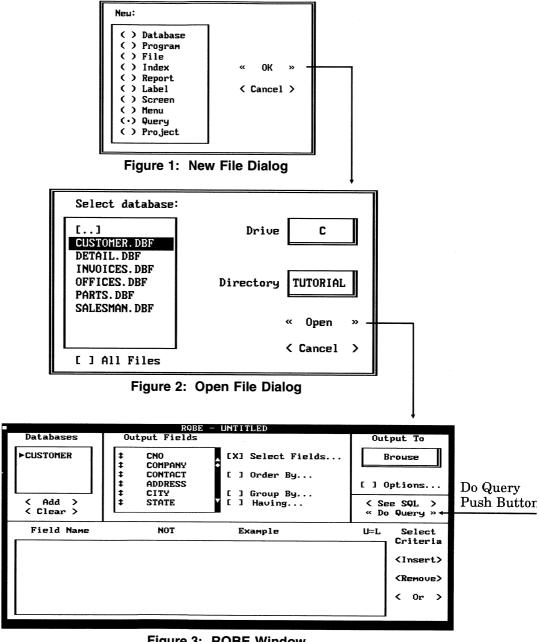

The RQBE window appears as in Figure 3.

```
┌──────────────────────────────────────────┐
│ New:                                       │
│  ┌──────────────────┐                      │
│  │ ( ) Database     │                      │
│  │ ( ) Program      │                      │
│  │ ( ) File         │                      │
│  │ ( ) Index        │      «   OK   »      │
│  │ ( ) Report       │                      │
│  │ ( ) Label        │     < Cancel >       │
│  │ ( ) Screen       │                      │
│  │ ( ) Menu         │                      │
│  │ (·) Query        │                      │
│  │ ( ) Project      │                      │
│  └──────────────────┘                      │
└──────────────────────────────────────────┘
```

Figure 1: New File Dialog

```
┌──────────────────────────────────────────────────┐
│ Select database:                                    │
│  ┌────────────────────┐      Drive  ┌──────┐        │
│  │ [..]               │             │  C   │        │
│  │ CUSTOMER.DBF       │             └──────┘        │
│  │ DETAIL.DBF         │                             │
│  │ INVOICES.DBF       │   Directory ┌──────────┐    │
│  │ OFFICES.DBF        │             │ TUTORIAL │    │
│  │ PARTS.DBF          │             └──────────┘    │
│  │ SALESMAN.DBF       │                             │
│  │                    │         «   Open   »        │
│  │                    │                             │
│  └────────────────────┘         < Cancel >          │
│  [ ] All Files                                      │
└──────────────────────────────────────────────────┘
```

Figure 2: Open File Dialog

```
┌──────────────────────────────────────────────────────────────────┐
│                        RQBE - UNTITLED                              │
│  Databases      Output Fields                      Output To        │
│ ┌───────────┐ ┌──────────────┐                   ┌──────────────┐  │
│ │►CUSTOMER  │ │↕  CNO        │▲ [X] Select Fields...│   Browse    │  │
│ │           │ │↕  COMPANY    │                   └──────────────┘  │
│ │           │ │↕  CONTACT    │  [ ] Order By...                    │
│ │           │ │↕  ADDRESS    │                   [ ] Options...    │
│ │           │ │↕  CITY       │  [ ] Group By...                    │
│ │ < Add  >  │ │↕  STATE      │▼ [ ] Having...    < See SQL  >      │
│ │ < Clear > │ └──────────────┘                   « Do Query » ◄─── │
│ └───────────┘                                                      │
│   Field Name         NOT        Example        U≈L    Select        │
│ ┌────────────────────────────────────────────┐        Criteria     │
│ │                                             │                     │
│ │                                             │       <Insert>      │
│ │                                             │                     │
│ │                                             │       <Remove>      │
│ │                                             │                     │
│ │                                             │       <  Or  >      │
│ └────────────────────────────────────────────┘                     │
└──────────────────────────────────────────────────────────────────┘
```
Do Query
Push Button

Figure 3: RQBE Window

When you perform a query, FoxPro keeps you posted about its progress. 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.

You'll output the results of your query to a Browse window. You can manipulate the Browse window just as you did in Chapter 4.

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 Velonex               Isador Sweet
││A3964│Acres Tree Solutions           Russell Kmickle
││A3882│Add Associates                 Len Silverman
││A1046│Add Inc                        Bert Crawford
││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 Velonex              │Isador Sweet          │
││A3964│Acres Tree Solutions          │Russell Kmickle       │
││A3882│Add Associates                │Len Silverman         │
││A1046│Add Inc                       │Bert Crawford         │
││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 CUSTOMER.COMPANY field in the **Database Fields** list and choose the **Move** → push button.

   You can double-click on the COMPANY field or press Enter when COMPANY is selected. They have the same effect as selecting the field and choosing **Move** →.

5. Repeat step four for the following fields: CONTACT, PHONE, CITY, STATE and YTDPURCH.

   Each field above is listed on your screen with the "CUSTOMER." prefix. We often refer to fields without the database prefix.

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.

```
                          RQBE  -  UNTITLED
  Databases           Output Fields                          Output To

 ►CUSTOMER          ‡    CNO              [X] Select Fields...      Browse
                    ‡    COMPANY
                    ‡    CONTACT          [ ] Order By...
                    ‡    ADDRESS                                 [ ] Options...
                    ‡    CITY            [ ] Group By...
  <  Add  >         ‡    STATE           [ ] Having...            < See SQL >
  < Clear >                                                      « Do Query »

    Field Name           NOT            Example          U≈L     Select
                                                                 Criteria

                                                                 <Insert>

                                                                 <Remove>

                                                                 <  Or  >
```

Figure 6: RQBE Window

```
      Database Fields                                Selected Output

  CUSTOMER.CITY        C     <  Move → >    ‡    CUSTOMER.COMPANY
  CUSTOMER.STATE       C                    ‡    CUSTOMER.CONTACT
  CUSTOMER.ZIP         C     <  All → >     ‡    CUSTOMER.PHONE
  CUSTOMER.PHONE       C                    ‡    CUSTOMER.CITY
  CUSTOMER.ONO         C                    ‡    CUSTOMER.STATE
  CUSTOMER.YTDPURCH    N     <  Remove >    ‡    CUSTOMER.YTDPURCH
  CUSTOMER.LAT         N                    ‡
  CUSTOMER.LONG        N     <Remove All>   ‡

  Functions/Expressions                    [ ] No Duplicates
                                           [ ] Cross Tabulate
    Functions
                                              «   OK   »

                                           < Cancel >
```

Figure 7: RQBE Select Fields Dialog

Doing the Query

1. Choose the **Do Query** push button in the RQBE window.

2. Size the Browse window so that it appears as shown in Figure 8. Figure 8 also shows the COMPANY field resized.

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

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	Talahase
AZ Inc	Tom Totah	617/823-5180	Taunton
Abbymark Velonex	Isador Sweet	214/922-4927	Dallas
Acres Tree Solutions	Russell Kmickle	201/786-0785	Sparta
Add Associates	Len Silverman	415/897-2810	Novato
Add Inc	Bert Crawford	303/499-2086	Boulder
Adder Incorporated	Brenda Carturight	313/573-5873	Warren
Adv. Software	Barbara H. Martin	617/646-7974	Arlington

Figure 8: Browse Window Showing Specific Fields

After studying the Browse window, 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**.

6. Size the Browse window so it appears as shown in Figure 10 then scroll through some records.

```
┌──────────────────────────────────────────────────────────────────────┐
│■                          RQBE  -  UNTITLED                            │
│  Databases          Output Fields                      Output To       │
│ ┌──────────┐  ┌─────────────────────┐             ┌──────────────────┐ │
│ │►CUSTOMER │  │ ‡   COMPANY      [X] Select Fields...│     Browse      │ │
│ │          │  │ ‡   PHONE                           └──────────────────┘ │
│ │          │  │ ‡   CITY         [ ] Order By...    QUERY               │
│ │          │  │ ‡   STATE                           [ ] Options...      │
│ │          │  │ ‡   YTDPURCH     [ ] Group By...                        │
│  < Add  >    │ ‡                 [ ] Having...      < See SQL  >        │
│  < Clear >   └─────────────────────┘               « Do Query »────────┤
│                                                                        │
│   Field Name           NOT          Example        U≈L    Select       │
│ ┌──────────────────────────────────────────────┐        Criteria      │
│ │                                                │                      │
│ │                                                │        <Insert>      │
│ │                                                │                      │
│ │                                                │        <Remove>      │
│ │                                                │                      │
│ │                                                │        <  Or  >      │
│ │                                                │                      │
│ └──────────────────────────────────────────────┘                      │
└──────────────────────────────────────────────────────────────────────┘
```

Output Fields List
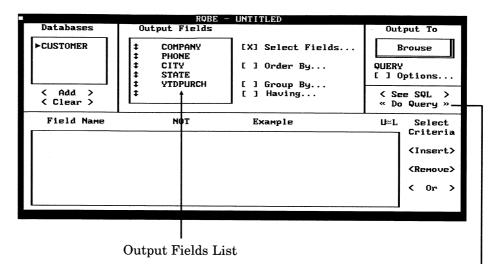
Figure 9: RQBE Window

```
┌──────────────────────────────────────────────────────────────────────┐
│■                             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 Velonex       │ 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 the 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. You may need to resize the COMPANY field to see all of its information. (Figure 13)

6. Scroll through some records in the Browse window.

```
 ■                          RQBE  -  UNTITLED
   Databases        Output Fields                          Output To
 ►CUSTOMER        ↕    COMPANY     [X] Select Fields...      Browse
                  ↕    PHONE       ┌────────────────────
                  ↕    CITY        [ ] Order By...        QUERY
                  ↕    STATE                              [ ] Options...
                  ↕    YTDPURCH    [ ] Group By...
   <  Add  >      ↕                [ ] Having...          < See SQL  >
   < Clear >                                              « Do Query »

    Field Name            NOT              Example         U≈L    Select
                                                                  Criteria

                                                                  <Insert>

                                                                  <Remove>

                                                                  <  Or  >
```

Figure 11: RQBE Window

```
      Selected Output                                 Ordering Criteria

   CUSTOMER.COMPANY            < Move → >         ↕   ↑ CUSTOMER.CITY
   CUSTOMER.PHONE                                 ↕
   CUSTOMER.CITY              < Remove >          ↕
   CUSTOMER.STATE                                 ↕
   CUSTOMER.YTDPURCH        ┌ Order Options ┐     ↕
                            (·) Ascending         ↕
                            ( ) Descending        ↕
                                                  ↕
                                                  ↕
                               «   OK   »         ↕
                                                  ↕
                             < Cancel >           ↕
```

Figure 12: RQBE Order By Dialog

```
 ■                                QUERY                                    ≡
   Company                       Phone         City          State  Ytdpurch
   ┌──────────────────────────────────────────────────────────────────────
   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+PgUp 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        │                │↕  ↑ CUSTOMER.CITY         │ │
││ │ CUSTOMER.CITY         │   < Remove >   │↕                          │ │
││ │ CUSTOMER.STATE        │                │↕                          │ │
││ │ CUSTOMER.YTDPURCH     │ ┌Order Options┐│↕                          │ │
││ │                       │ │(·) Ascending││↕                          │ │
││ │                       │ │( ) Descending││↕                         │ │
││ │                       │ └─────────────┘│↕                          │ │
││ │                       │                │↕                          │ │
││ │                       │    «   OK   »  │↕                          │ │
││ │                       │                │↕                          │ │
││ │                       │   < Cancel >   │↕                          │ │
││ └───────────────────────┘                └────────────────────────────┘│
│└──────────────────────────────────────────────────────────────────────┘│
└─────────────────────────────────────────────────────────────────────────┘
```
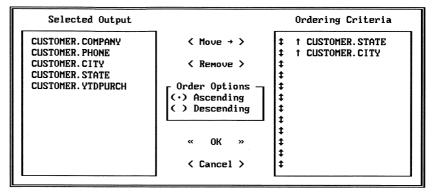
Figure 14: RQBE Order By Dialog

Company	Phone	City	State	Ytdpurch
Yergen 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 Comp.	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)

   The **Field Name** and comparison popup controls are unusual because they look like text boxes. However, you cannot type in them because they are popup controls.

   Note: Each row in the bottom area of the RQBE window contains a **Field Name** and comparison popup control. This allows multiple selection conditions.

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

3. Type OH in the text box below **Example**. (Figure 17) Be sure both letters are capitalized.

Doing the Query

1. Choose **Do Query**. The Browse window appears. (Figure 18)

2. 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.

```
                    RQBE - UNTITLED
  Databases       Output Fields                         Output To
▶CUSTOMER        ‡    COMPANY      [X] Select Fields...     Browse
                 ‡    PHONE
                 ‡ 2↑ CITY         [X] Order By...
                 ‡ 1↑ STATE
                 ‡    YTDPURCH     [ ] Group By...       [ ] Options...
  < Add  >       ‡                 [ ] Having...
  < Clear >                                             < See SQL  >
                                                        « Do Query »

     Field Name           NOT         Example        Up≈Lo   Select
                                                             Criteria

                                                             <Insert>

                                                             <Remove>

                                                             <  Or  >
```

Choose the Field Name Popup Control →
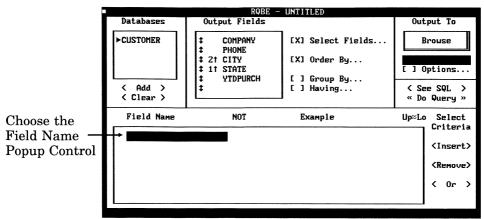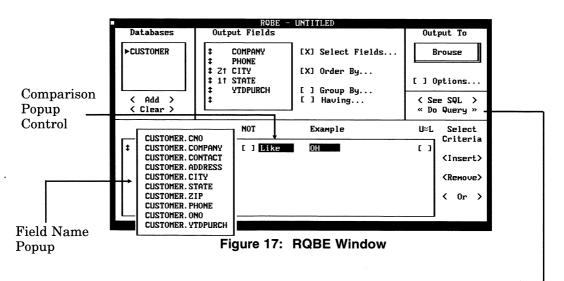
Figure 16: RQBE Window with Field Name Popup Control

```
                    RQBE - UNTITLED
  Databases       Output Fields                         Output To
▶CUSTOMER        ‡    COMPANY      [X] Select Fields...     Browse
                 ‡    PHONE
                 ‡ 2↑ CITY         [X] Order By...
                 ‡ 1↑ STATE
                 ‡    YTDPURCH     [ ] Group By...       [ ] Options...
  < Add  >       ‡                 [ ] Having...
  < Clear >                                             < See SQL  >
                                                        « Do Query »
                                NOT      Example      U≈L   Select
     CUSTOMER.CNO                                            Criteria
  ‡  CUSTOMER.COMPANY        [ ] Like   OH            [ ]
     CUSTOMER.CONTACT                                        <Insert>
     CUSTOMER.ADDRESS
     CUSTOMER.CITY                                           <Remove>
     CUSTOMER.STATE
     CUSTOMER.ZIP                                           <  Or  >
     CUSTOMER.PHONE
     CUSTOMER.ONO
     CUSTOMER.YTDPURCH
```

Comparison Popup Control ←

Field Name Popup

Figure 17: RQBE Window

QUERY				
Company	Phone	City	State	Ytdpurch
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 18: Browse Window with Companies in Ohio
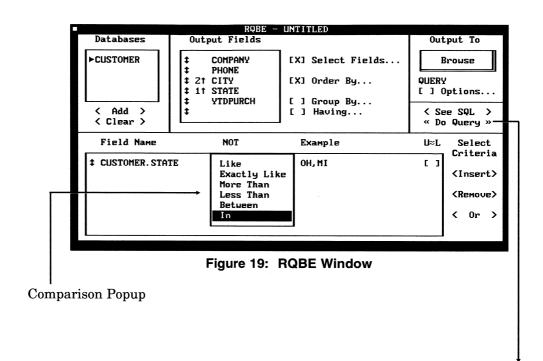
Use the same simple procedure to display those companies located in both Ohio and Michigan.

Specifying More Selection Conditions

1. Close the Browse window.

2. Select **In** from the comparison popup (between the **Field Name** popup and the **Example** text box). (Figure 19)

3. In the **Example** text box, after OH type ,MI (Figure 19)

4. Choose **Do Query**. The Browse window appears as in Figure 20.

5. Size the Browse window and scroll through some records.

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.

```
┌─────────────────────── RQBE - UNTITLED ───────────────────────┐
│  Databases      Output Fields                   Output To      │
│                                                                │
│ ►CUSTOMER      ↕    COMPANY    [X] Select Fields...   ┌────────┐│
│                ↕    PHONE                             │ Browse ││
│                ↕ 2↑ CITY       [X] Order By...        └────────┘│
│                ↕ 1↑ STATE                          QUERY       │
│                ↕    YTDPURCH   [ ] Group By...     [ ] Options...│
│  < Add >       ↕               [ ] Having...                   │
│  < Clear >                                         < See SQL > │
│                                                    « Do Query »│
├────────────────────────────────────────────────────────────────┤
│   Field Name          NOT         Example       U≈L    Select  │
│                                                        Criteria │
│ ↕ CUSTOMER.STATE    ┌───────────┐ OH,MI         [ ]            │
│                     │ Like      │                     <Insert> │
│                     │ Exactly Like                            │
│                     │ More Than │                     <Remove> │
│                     │ Less Than │                             │
│                     │ Between   │                     <  Or  > │
│                     │ In        │                             │
│                     └───────────┘                             │
└────────────────────────────────────────────────────────────────┘
```

Figure 19: RQBE Window

Comparison Popup

```
┌──────────────────────────── QUERY ────────────────────────────┐
│ 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│
│ Hennekee 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 20: 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 from the **Ordering Criteria** list then choose **Remove**.

4. Select CUSTOMER.COMPANY from the **Selected Output** list then choose **Move** →.

5. Choose **OK**. The RQBE window appears as in Figure 21.

6. Choose **Do Query**. The Browse window appears as in Figure 22.

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       ↕ 2↑ COMPANY      [X] Select Fields...    ┌────────────┐  │
│                 ↕    PHONE                                │   Browse    │  │
│                 ↕    CITY         [X] Order By...         └────────────┘  │
│                 ↕ 1↑ STATE                               QUERY            │
│                 ↕    YTDPURCH     [ ] Group By...         [ ] Options...  │
│   < Add  >      ↕                 [ ] Having...                           │
│   < Clear >                                               < See SQL  >    │
│                                                           « Do Query »────┼──┐
│  ┌──────────────────────────────────────────────────────────────────┐   │  │
│   Field Name            NOT         Example          U≈L    Select        │  │
│                                                             Criteria      │  │
│ ↕ CUSTOMER.STATE        [ ] In      OH,MI            [ ]                  │  │
│                                                             <Insert>      │  │
│                                                                           │  │
│                                                             <Remove>      │  │
│                                                                           │  │
│                                                             <  Or  >      │  │
│                                                                           │  │
│                                                                           │  │
└───────────────────────────────────────────────────────────────────────────┘  │
```

Figure 21: 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 22:   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 know how easy it is to specify this using the RQBE window.

Specifying More Selection Conditions

1. Close the Browse window.

2. Place the cursor in the row below CUSTOMER.STATE and click or press Enter to display the **Field Name** popup then choose CUSTOMER.YTDPURCH.

3. Choose **More Than** from the comparison popup.

4. In the **Example** text box, type 1000.

5. When the RQBE window appears as in Figure 23, choose **Do Query**. The Browse window appears. (Figure 24)

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 │   │ ↕    COMPANY         │   │[X] Select Fields...│ │ Browse │││
│ │          │   │ ↕    PHONE           │   │[X] Order By...     │           │
│ │          │   │ ↕ 2↑ CITY            │   │[ ] Group By...     │ [ ] Options...│
│ │          │   │ ↕ 1↑ STATE           │   │[ ] Having...       │           │
│ └──────────┘   │ ↕    YTDPURCH        │   │                    │ < See SQL  > │
│  < Add   >     │ ↕                    │   │                    │ « Do Query »─┼──┐
│  < Clear >     └──────────────────────┘                                    │  │
│                                                                            │  │
│   Field Name            NOT          Example          U≈L    Select        │  │
│                                                              Criteria      │  │
│  ↕ CUSTOMER.STATE       [ ] In       OH,MI            [ ]                   │  │
│  ↕ CUSTOMER.YTDPURCH    [ ] More Than 1000            [ ]    <Insert>       │  │
│                                                                            │  │
│                                                              <Remove>       │  │
│                                                                            │  │
│                                                              <  Or  >       │  │
│                                                                            │  │
└────────────────────────────────────────────────────────────────────────┘  │
```

Figure 23: 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 24: Companies in Michigan or Ohio with
Year-to-Date Purchases > $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."

Unfortunately, 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 25, choose **Do Query**. The Browse window appears.

Query output lists only companies beginning with "Tr" so you can size the Browse window then scroll until you find the right name. See Figure 26.

"Mr. Kieckheser, how could I forget you. How are things at Triad Resort Computers?"
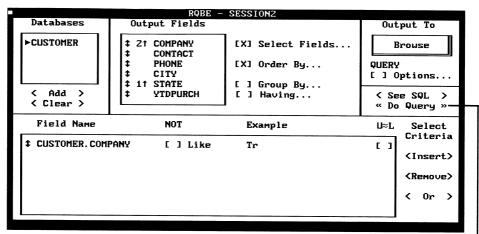
Figure 25: RQBE Window

Figure 26: 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 GSCHAP5 in the text box as shown in Figure 28, then choose **Save**.

```
╔════════════════════════════════════════════╗
║     Do you want to save changes to          ║
║  C:\FOXPRO25\TUTORIAL\UNTITLED.QPR?          ║
║                                              ║
║  «   Yes   »    <   No   >   < Cancel >      ║
╚════════════════════════════════════════════╝
```

Figure 27: Save Changes Alert

```
╔══════════════════════════════════════════════╗
║   Save Current Document As:                    ║
║  ┌────────────────────┐                        ║
║  ►[..]                     Drive  ┌─────────┐  ║
║   STEP1.QPR                       │    C    │  ║
║   STEP2.QPR                       └─────────┘  ║
║   STEP3.QPR                                    ║
║   STEP4.QPR                Directory ┌────────┐║
║   STEP5.QPR                          │TUTORIAL│║
║  │                    │              └────────┘║
║  │                    │                        ║
║  └────────────────────┘           «  Save  »  ║
║   [ ] All Files                   < Cancel >  ║
║  ┌──────────────────────────────────────────┐ ║
║  │ GSCHAP5                                   │ ║
║  └──────────────────────────────────────────┘ ║
╚══════════════════════════════════════════════╝
```
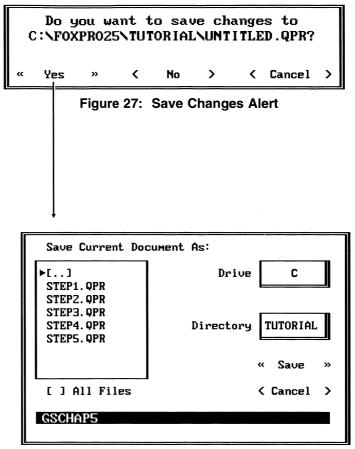
Figure 28: Save As Dialog

Reporting on Your Data

In this session, you'll learn how to use the RQBE window to quickly design and generate reports using your data.

RQBE Reporting

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 Chapter 5.

Opening an Existing Query

1. Close the Command window.

2. Choose **Open...** from the **File** menu. Make sure **TUTORIAL** is showing on the **Directory** popup control and **Query** is showing on the **Type** popup control in the Open File dialog. (Figure 1)

3. Select GSCHAP5.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**.

```
┌──────────────────────────────────────────────────────┐
│  Open:                                                 │
│  ┌────────────────────┐                                │
│  │ [..]               │         Drive  ┌──────────┐    │
│  │ GSCHAP5.QPR        │                │    C     │    │
│  │ STEP1.QPR          │                └──────────┘    │
│  │ STEP2.QPR          │                                │
│  │ STEP3.QPR          │      Directory ┌──────────┐    │
│  │ STEP4.QPR          │                │ TUTORIAL │    │
│  │ STEP5.QPR          │                └──────────┘    │
│  │                    │                «   Open   »    │
│  └────────────────────┘                                │
│    [ ] All Files                       <   New   >     │
│  ┌────────────────────┐                                │
│  │      Query         │  Type          < Cancel >      │
│  └────────────────────┘                                │
└──────────────────────────────────────────────────────┘
```

Figure 1: Open File Dialog

Type Popup Control

Output To Popup Control

```
┌──────────────────────────────────────────────────────────────┐
│■               RQBE  -  GSCHAP5                                 │
│  Databases       Output Fields                    │ Output To   │
│ ┌─────────┐  ┌──────────────┐                    ┌───────────┐ │
│ │►CUSTOMER│  │↕ 2↑ COMPANY  │  [X] Select Fields...│Report/Label│ │
│ │         │  │↕    PHONE    │                     └───────────┘ │
│ │         │  │↕    CONTACT  │  [X] Order By...                  │
│ │         │  │↕    CITY     │                      [ ] Options...│
│ └─────────┘  │↕ 1↑ STATE    │  [ ] Group By...                  │
│  < Add  >    │↕             │  [ ] Having...       < See SQL  > │
│  < Clear >   └──────────────┘                      « Do Query » │
│ ┌──────────────────────────────────────────────────┐  U≈L  Select│
│  Field Name        NOT         Example             │       Criteria│
│ │↕ CUSTOMER.STATE    [ ] Like    CA                 │  [ ]        │
│ │                                                   │      <Insert>│
│ │                                                   │             │
│ │                                                   │      <Remove>│
│ │                                                   │             │
│ │                                                   │      <  Or  >│
│ └──────────────────────────────────────────────────┘             │
└──────────────────────────────────────────────────────────────┘
```

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.

```
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 Heitmeier  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     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 GSCHAP6 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 TUTORIAL\GSCHAP6.FRX in the **Save As** text box. Simply type over the name that already appears in the 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 - GSCHAP5
  Databases        Output Fields                          Output To
▶CUSTOMER         ↕ 2↑ COMPANY    [X] Select Fields...    Report/Label
                  ↕    PHONE
                  ↕    CONTACT     [X] Order By...         [ ] Options...
                  ↕    CITY
                  ↕ 1↑ STATE      [ ] Group By...         < See SQL  >
  < Add   >       ↕                [ ] Having...           « Do Query »
  < Clear >

   Field Name          NOT          Example          U≈L    Select
                                                             Criteria
↕ CUSTOMER.STATE      [ ] Like      CA               [ ]
                                                            <Insert>

                                                            <Remove>

                                                            <  Or  >
```

Figure 4: RQBE Window

Report
Radio
Button

```
RQBE Display Options:

 ┌─ Formatting Options ──────────┐   ┌─ Output Destinations ──┐
 ( ) Screen Display                   [ ] To Printer
 (·) Report                           [ ] To File
 ( ) Label                              [ ] Overwrite File
 [X] Report/Label Form Name           [ ] Use Printer Setup
     GSCHAP6                              in Report/Label Form
 [ ] Quick Report... [ ] Overwrite
 [X] Preview Report/Label
 [ ] Show Summary Info Only
 [ ] Eject Page Before Report
 [ ] Report Heading                       «   OK   »

 [ ] Suppress Column Headings          < Cancel  >
 (·) Console On ( ) Console Off
     [ ] Pause Between Screens
```

Figure 5: RQBE Display Options Dialog

```
RQBE Quick Report:

 (·) Column Layout    Field1 Field2
 ( ) Form Layout      XXXXXX XXXXXX
                      XXXXXX XXXXXX
 Report Width  80     XXXXXX XXXXXX

 Save as TUTORIAL\GSCHAP6.FRX

    «    OK   »     <   Clear   >
```

Figure 6: Quick Report Dialog

Doing the Query

   Choose **Do Query**.

Remember the **Preview Report/Label** check box that was automatically checked? Although output fills the entire screen as it did before, the output now appears in a Page Preview window. The Page Preview window has many of the features discussed in the Groundwork chapter, including a horizontal scroll bar and a close box. See Figure 7.

```
 System   File   Edit   Database   Record   Program   Window   RQBE
 ▪
 ------------------------------------------------------------------------
 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 Kmickle       Menlo Park
 « Done »  < More >   Column:   0
 ◄◆                                                                      ►
```

Figure 7: GSCHAP6 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.
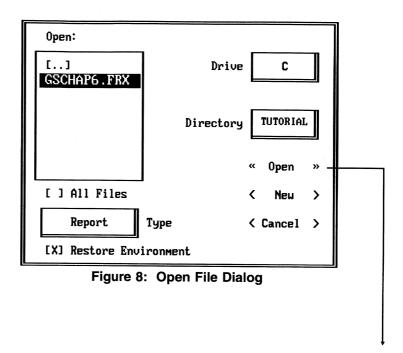
Opening a Report Form

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 then make sure **Report** shows on the **Type** popup control and **TUTORIAL** shows on the **Directory** popup control. (Figure 8)

3. Select GSCHAP6.FRX, then choose **Open**.

A 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.

```
Open:

[..]
GSCHAP6.FRX                        Drive      C


                             Directory   TUTORIAL


                                       «   Open   »
[ ] All Files                          <   New    >
      Report       Type               < Cancel  >
[X] Restore Environment
```

Figure 8: Open File Dialog

```
                          GSCHAP6.FRX
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()
```
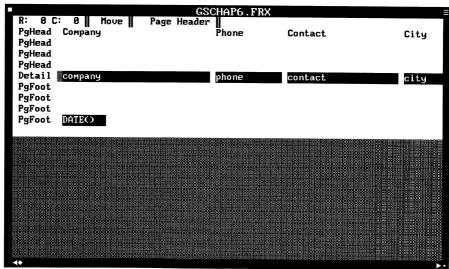
Figure 9: GSCHAP6 Report Form

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, functions and graphic objects. 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. Press the arrow keys to move each field heading down to the third PgHead band then center each 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:

Point to each field heading and click to select it. Drag the heading down to the third PgHead band then center it over the appropriate field. Be sure to scroll right to see all of the headings.

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. (Figure 10)

You'll notice a status bar at the top of the report. The status bar lets you know which report band, row, and column you are in. There is also an area in the status bar that tells you whether you are in Move or Text mode.

In Move mode you can move objects around the report using the arrow keys, Home, End, Ctrl+Home, Ctrl+End or the mouse. Typing a character or the Ctrl+arrow keys will put you into Text mode. You can also get into Text mode by choosing **Text** from the **Report** menu. In Text mode, all keys apply to word processing type operations. If you can't move an object, look at the status bar to see what mode you are in. To exit Text mode, press Enter.

```
                              GSCHAP6.FRX                              ≡
 R:   4 C: 62 ‖  Move ‖          Detail ‖
 PgHead                          Customer Phone List
 PgHead
 PgHead        Company              Phone            Contact          Cit
 PgHead
 Detail  company              phone        contact              city
 PgFoot
 PgFoot
 PgFoot
 PgFoot  DATE()
 ◄◆                    '                                              ►·
```
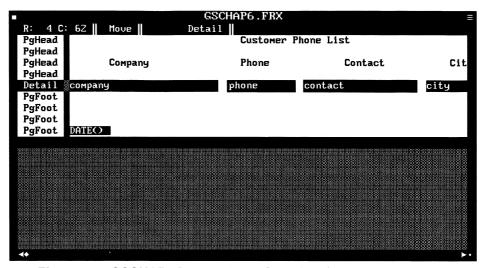
Figure 10: GSCHAP6 Report Form Showing Centered Headings

Doing the Query

1. Choose **RQBE - GSCHAP5** from the **Window** menu.

2. Choose **Do Query**.

Notice that the report now reflects the changes that you made to the GSCHAP6 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 Kmickle   Menlo Park
 « Done »  < More >    Column:   0
◀▶                                                            ▶
```

Figure 11: Page Preview Window Showing Centered Headings

Try making a few changes to achieve a more polished look.

Placing and Sizing a Box in a Report Form

1. Choose **Done** from the bottom of the Page Preview window then choose **GSCHAP6.FRX** from the **Window** menu.

2. Position the cursor in the Report Layout window where you want the upper left corner of the box to appear.

3. Choose **Box** from the **Report** menu.

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, point to the lower right corner of 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) DATE( ) is a FoxPro function that returns the current system date when you run your report:

   - 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. Press Enter to confirm the move.

   - With the mouse, point to DATE( ), 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 — the system memory variable _PAGENO appears as _PAG on your screen because its display width is defined as 4. For information on changing field widths refer to the Report Writer chapter of the FoxPro *User's Guide*.

```
┌─────────────────────────────────────────────────────────────┐
│■                        GSCHAP6                              ≡│
│ R:  5 C: 67 ║ Move ║    Page Footer ║                        │
│ PgHead    │DATE()    │              Customer Phone List       │
│ PgHead                                                        │
│ PgHead    ┌───────────────────────────────────────────────── │
│           │   Company              Phone        Contact    City│
│ PgHead    │                                                    │
│ Detail    │company          │  │phone   │ │contact   │ │city  ││
│ PgFoot                                                        │
│ PgFoot                                                        │
│ PgFoot                                                        │
│ PgFoot                                                        │
│                                                               │
│                                                               │
│                                                               │
│◄♦                                                          ►·│
└─────────────────────────────────────────────────────────────┘
```
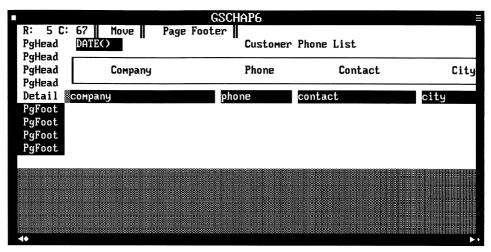
Figure 12: Report Layout Window with Box and Moved DATE( ) Field

Doing the Query

Choose **RQBE - GSCHAP5** from the bottom of the **Window** menu then choose **Do Query.**

Again, the changes you made to the GSCHAP6 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 Knickle        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 on this page.

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.

2. Make sure **TUTORIAL** is showing on the **Directory** popup control. Type GSCHAP6 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:                                          │
│  ┌─ Formatting Options ──────────────┐  ┌─ Output Destinations ─┐
│  │ ( ) Screen Display                │  │ [X] To Printer        │
│  │ (·) Report                        │  │ [ ] To File           │
│  │ ( ) Label                         │  │     [ ] Overwrite File │
│  │ [X] Report/Label Form Name        │  │ [ ] Use Printer Setup  │
│  │     GSCHAP6                        │  │     in Report/Label Form│
│  │ [X] Quick Report... [X] Overwrite │  └────────────────────────┘
│  │ [ ] Preview Report/Label          │
│  │ [ ] Show Summary Info Only        │
│  │ [X] Eject Page Before Report      │          «   OK   »
│  │ [ ] Report Heading                │
│  │                                   │          <  Cancel  >
│  │ [ ] Suppress Column Headings      │
│  │ ( ) Console On (·) Console Off    │
│  │     [ ] Pause Between Screens     │
│  └───────────────────────────────────┘
└──────────────────────────────────────────────────────────────┘
```

Output
Destinations
Area
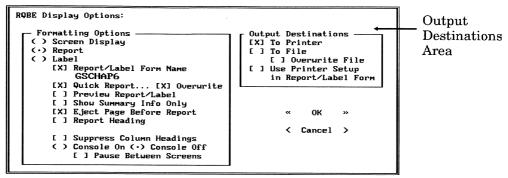
Figure 14: RQBE Display Options Dialog

```
 04/04/91                 Customer Phone List              Page    1

    ┌──────────────────────────────────────────────────────────────┐
    │     Company          Phone         Contact         City     St│
    └──────────────────────────────────────────────────────────────┘
 Add Associates          415/897-2810 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 Tronixs Computer 213/452-9369 Andy Rigney      Santa Monica  CA
 Big Incorporated        818/762-5886 Bert Dalgleish   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 Vogeltanz 714/850-4656 John Wigal      Huntington Bch CA
 Canadian International  415/781-4504 Jerry Alviston   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 Komputers Group 209/477-5675 Alan Au         Stockton      C
 ﹏mond Inc.              213/865-2﹏﹏ ﹏ward Stevens   Cerritos
```

Figure 15: Printed Report

Reporting with Multiple Databases

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

Relating Data

Reporting with Multiple Databases

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

Begin with the query that you saved at the end of the last chapter.

Opening an Existing Query

1. Choose **Open...** from the **File** menu. Make sure **TUTORIAL** is showing on the **Directory** popup control and **Query** is showing on the **Type** popup control.

2. Open GSCHAP6.QPR. (Figure 1)

```
┌─────────────────────────────────────────────────────────────────────┐
│                      RQBE  -  GSCHAP6                                  │
│ Databases        Output Fields                        Output To       │
│                                                                       │
│ ►CUSTOMER        ↕ 2↑ COMPANY      [X] Select Fields...  ┌──────────┐ │
│                  ↕    PHONE                              │Report/Label│ │
│                  ↕    CONTACT      [X] Order By...       └──────────┘ │
│                  ↕    CITY                                             │
│                  ↕ 1↑ STATE        [ ] Group By...       [X] Options... │
│ <  Add  >        ↕                 [ ] Having...         <  See SQL  > │
│ < Clear >                                               « Do Query » │
│                                                                       │
│   Field Name          NOT          Example        Up≈Lo   Select      │
│                                                           Criteria    │
│ ↕ CUSTOMER.STATE     [ ] Like      "CA"           [ ]                 │
│                                                           <Insert>    │
│                                                                       │
│                                                           <Remove>    │
│                                                                       │
│                                                           <  Or  >    │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```
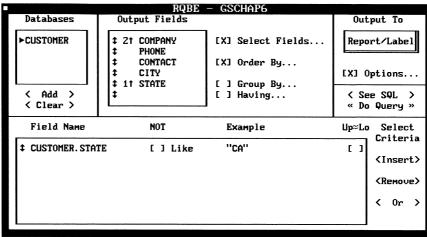
Figure 1: GSCHAP6.QPR

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 IN-VOICES.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:                                               ║
║                                                                    ║
║  ┌─────────────────┐ ┌─────────┐ ┌─────────┐ ┌─────────────────┐   ║
║  │  INVOICES.CNO   │ │ [ ] NOT │ │  Like   │ │  CUSTOMER.CNO   │   ║
║  └─────────────────┘ └─────────┘ └─────────┘ └─────────────────┘   ║
║                                                                    ║
║   [ ] Ignore Upper/Lower Case           «    OK    »               ║
║                                                                    ║
║                                         <  Cancel  >               ║
║                                                                    ║
╚════════════════════════════════════════════════════════════════════╝
```

Figure 2: RQBE Join Condition Dialog

```
■════════════════════════ RQBE  -  GSCHAP6 ════════════════════════
  Databases       Output Fields                        Output To

  ┌───────────┐   ↕ 1↑ COMPANY      [X] Select Fields...  ┌──────────┐
  │ CUSTOMER  │   ↕    PHONE                               │  Browse  │
  │►INVOICES  │   ↕    CONTACT       [X] Order By...       └──────────┘
  │           │   ↕    IDATE                               SESSION3
  │           │   ↕    ITOTAL        [ ] Group By...       [ ] Options...
  └───────────┘   ↕                  [ ] Having...
  <  Add   >                                               < See SQL  >
  < Clear  >                                               « Do Query »

   Field Name           NOT         Example        Up≈Lo    Select
                                                            Criteria
  ↕┃INVOICES.CNO        [ ] Like    CUSTOMER.CNO    [ ]
  ↕ CUSTOMER.STATE      [ ] Like    "CA"            [ ]     <Insert>

                                                            <Remove>

                                                            <  Or  >
```

Figure 3: RQBE Window

```
■════════════════════════════ GSCHAP6 ═══════════════════════════════≡
  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      │714/540-6062 │Bill Hopkins     │05/08/│
  │Azimuth Corp              │619/271-8518 │Al Reetz         │05/08/│
  │Belmar Tronixs Computer   │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 ─ GSCHAP6 ───────────────────────────┐
│ ■                                                                     │
│   Databases      Output Fields                         Output To      │
│                                                                       │
│  ┌──────────┐  ┌──────────────────────────────────┐  ┌─────────────┐ │
│  │ CUSTOMER │  │ ↕ 1↑ COMPANY   [X] Select Fields...│ │   Browse    │ │
│  │►INVOICES │  │ ↕    PHONE                         │ └─────────────┘ │
│  │          │  │ ↕    CONTACT   [X] Order By...     │  SESSION3       │
│  │          │  │ ↕ 2↑ IDATE                         │  [ ] Options... │
│  │          │  │ ↕    ITOTAL    [ ] Group By...     │                 │
│  │ < Add  > │  │ ↕              [ ] Having...       │  < See SQL  >   │
│  │ < Clear >│  │                                    │  « Do Query »───┼──┐
│  └──────────┘  └──────────────────────────────────┘                  │  │
│                                                                       │  │
│   Field Name          NOT        Example        Up≈Lo  Select         │  │
│  ┌────────────────────────────────────────────────────│  Criteria    │  │
│  │↕│ INVOICES.CNO    [ ] Like   CUSTOMER.CNO    [ ]    │             │  │
│  │↕ CUSTOMER.STATE   [ ] Like   "CA"            [ ]    │  <Insert>   │  │
│  │                                                     │             │  │
│  │                                                     │  <Remove>   │  │
│  │                                                     │             │  │
│  │                                                     │  <  Or  >   │  │
│  │                                                     │             │  │
│  └─────────────────────────────────────────────────────             │  │
└───────────────────────────────────────────────────────────────────────┘  │
```

Figure 5: RQBE Window

```
                    ┌──────────────────── GSCHAP6 ──────────────────────┐◄──┘
                    │ ■                                               ≡ │
                    │ 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│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 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
   TUTORIAL\GSCHAP7.FRX in the **Save as** text box.
   Simply type over the name that's already in the 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  ││
│   Report Width  ██80██             │ xxxxxx  xxxxxx  ││
│                                    └─────────────────┘│
│   Save as  ██TUTORIAL\GSCHAP7.FRX██                   │
│                                                       │
│      «     OK    »        <   Clear   >               │
│                                                       │
└─────────────────────────────────────────────────────┘
```
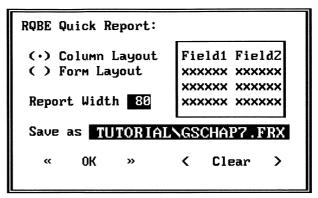
Figure 7: RQBE Quick Report Dialog

```
┌──────────────────────────────────────────────────────────────────────┐
│ 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 Komputers 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: GSCHAP7 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. Make sure **TUTORIAL** is showing on the **Directory** popup control and **Report** is showing on the **Type** popup control.

3. Select GSCHAP7.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 the word "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.

```
╔══════════════════════════════════════════════════════════════════════╗
■                               GSCHAP7.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()
```
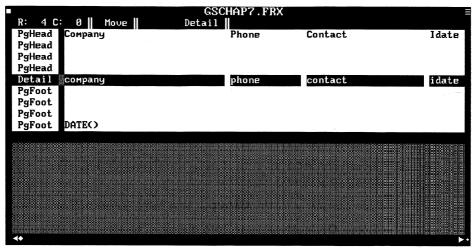
Figure 9: GSCHAP7 Report Form

```
╔══════════════════════════════════════════════════════════════════════╗
■                               GSCHAP7.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
```
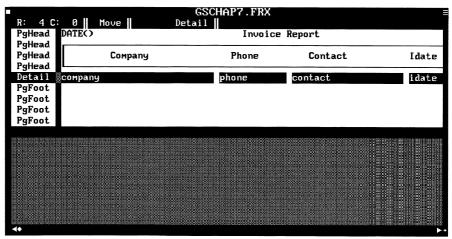
Figure 10: GSCHAP7 Report Form with Title, Centered Headings and
Box
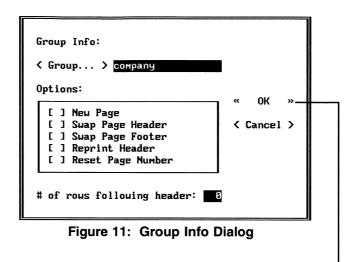
When your data is ordered by a field, such as COMPANY, you can use the Report Writer to group all the information about each company.

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. 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.

```
Group Info:

< Group... >  company

Options:
                                        «   OK   »──────
   [ ] New Page
   [ ] Swap Page Header                 < Cancel >
   [ ] Swap Page Footer
   [ ] Reprint Header
   [ ] Reset Page Number


# of rows following header:    0
```

Figure 11: Group Info Dialog

```
Group:
                                        «   OK   »
  ‡ company
  ‡                                     ─────────
  ‡
  ‡                                     <  Add  >
  ‡
  ‡                                     < Change >
  ‡
  ‡                                     < Delete >
  ‡
```
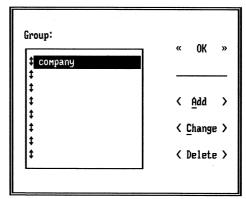
Figure 12: Group Dialog

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.
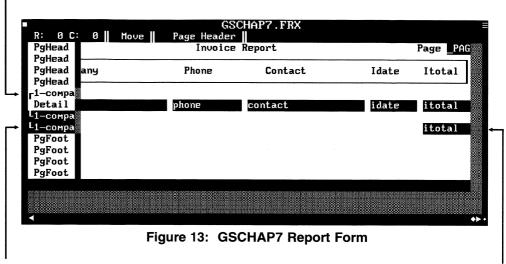
Changing Band Size and Copying a Field

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.

   - With the mouse, point to "1–company" in the group footer band and drag the mouse down.

2. Select field ITOTAL and choose **Copy** from the **Edit** menu. Place the cursor in the bottom line of the group footer band under field ITOTAL and choose **Paste** from the **Edit** menu. (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

```
┌──────────────────────────────────────────────────────────────────────┐
│■                         GSCHAP7.FRX                                  ≡│
│  R:   0 C:   0 ║   Move ║   Page Header ║                              │
│  PgHead                   Invoice Report                    Page _PAG  │
│  PgHead                                                                │
│  PgHead  any          Phone         Contact        Idate    Itotal     │
│  PgHead                                                                │
│┌1-compa                                                                │
│  Detail               phone         contact        idate    itotal     │
│└1-compa                                                                │
│└1-compa                                                     itotal      │
│  PgFoot                                                                │
│  PgFoot                                                                │
│  PgFoot                                                                │
│  PgFoot                                                                │
│                                                                        │
│                                                                        │
│◄                                                                   ◆►· │
└──────────────────────────────────────────────────────────────────────┘
```

Figure 13: GSCHAP7 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:

   • With the keyboard, place the cursor on ITOTAL and double-click with the Spacebar.

   • With the mouse, point to ITOTAL and double-click.

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**.

```
┌──────────────────────────────────────────────┐
│ ┌────────────────────────────────────────────┐│
│ │                                            ││
│ │  Reset:     ┌──────────────────────┐       ││
│ │             │       company        │       ││
│ │             └──────────────────────┘       ││
│ │                                            ││
│ │  Calculate: ┌────────────────────┐         ││
│ │             │ ( ) Nothing        │         ││
│ │             │ ( ) Count          │  «  OK  »││
│ │             │ (•) Sum            │         ││
│ │             │ ( ) Average        │ < Cancel >││
│ │             │ ( ) Lowest         │         ││
│ │             │ ( ) Highest        │         ││
│ │             │ ( ) Std. Deviation │         ││
│ │             │ ( ) Variance       │         ││
│ │             └────────────────────┘         ││
│ └────────────────────────────────────────────┘│
└──────────────────────────────────────────────┘
```
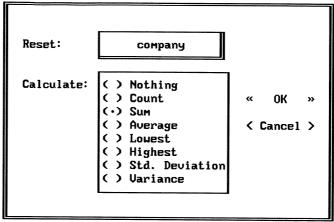
Figure 14: Calculate Field Dialog

```
┌──────────────────────────────────────────────┐
│ ┌────────────────────────────────────────────┐│
│ │                                            ││
│ │  Report Expression:                        ││
│ │                                            ││
│ │  <  Expr... >  itotal                      ││
│ │                                            ││
│ │  < Format... >  ▮▮▮▮▮▮▮▮▮     Width:  8     ││
│ │                                            ││
│ │  [ ] Style...     [ ] Suppress...          ││
│ │  [X] Calculate...                          ││
│ │  [ ] Comment...                            ││
│ │                                            ││
│ │          «   OK   »   < Cancel >           ││
│ │                                            ││
│ └────────────────────────────────────────────┘│
└──────────────────────────────────────────────┘
```
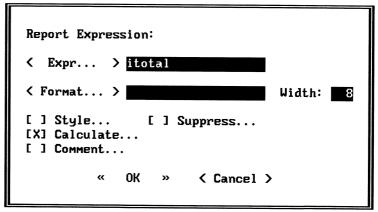
Figure 15: Report Expression Dialog

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

Drawing a Line

1. Place the cursor below the "i" in the top ITOTAL field.

2. Choose **Box** from the **Report** menu.

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.

Relating Data
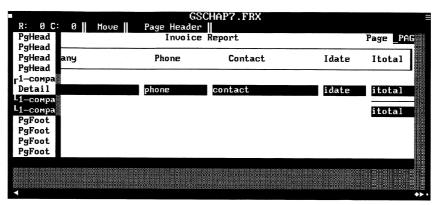
Figure 16: GSCHAP7 Report Form

Doing the Query

1. Choose **RQBE – GSCHAP6** from the **Window** menu.

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 **GSCHAP7.FRX** from the **Window** menu.

3. Choose the COMPANY field to display the Report Expression dialog:

    • With the keyboard, place the cursor on COMPANY and double-click with the Spacebar.

    • With the mouse, point to COMPANY and double-click.

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: GSCHAP7 Report in Page Preview Window

```
┌────────────────────────────────────────────┐
│                                              │
│   Suppress Repeated Values:                  │
│   ┌────────────────────────┐                 │
│   │ (•) On        ( ) Off  │   «   OK   »   │
│   └────────────────────────┘                 │
│                                              │
│   Reset:                      < Cancel >     │
│   ┌────────────────────────┐                 │
│   │        company         │                 │
│   └────────────────────────┘                 │
│                                              │
└────────────────────────────────────────────┘
```
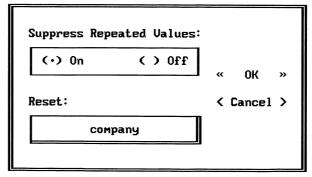
Figure 18: Suppress Repeated Values Dialog

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

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

Changing the Size of a Band

1. Add another group footer band. (Figure 19)

2. If necessary, move ITOTAL back up to the second group footer band, under the line. (Figure 19)

3. Choose **RQBE – GSCHAP6** from the **Window** menu.

4. Choose **Do Query**. Your report should appear as in Figure 20.

```
■                           GSCHAP7.FRX                              ≡
  R:  0 C:   0 ║  Move  ║  Page Header ║
  PgHead                        Invoice Report               Page  ▐PAG▓
  PgHead                                                                ▓
  PgHead  any         Phone        Contact       Idate    Itotal       ▓
  PgHead                                                                ▓
 ┌1─compa▓                                                              ▓
  Detail ▓            phone        contact       idate    itotal       ▓
 └1─compa▓                                                             ▓
 └1─compa▓                                                   itotal    ▓
 └1─compa▓                                                             ▓
  PgFoot                                                               ▓
  PgFoot                                                               ▓
  PgFoot                                                               ▓
  PgFoot                                                               ▓
                                                                       ▓
  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
  ◄                                                               ◆►·
```
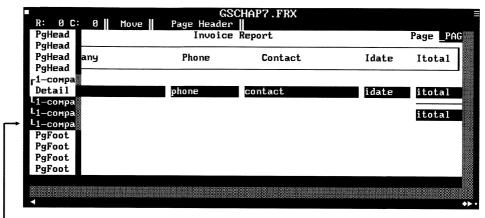
Figure 19: GSCHAP7 Report Form

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: GSCHAP7 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 **Done** from the Page Preview window.

2. Choose **Save as...** from the **File** menu.

3. Make sure **TUTORIAL** shows on the **Directory** popup control, type GSCHAP7 in the text box then choose **Save.**

4. Close the RQBE window.

5. Close the report window then choose **Yes** when FoxPro asks about saving changes.

```
┌─────────────────────────────────────────────────────────────────┐
│  RQBE Display Options:                                            │
│                                                                   │
│   ┌─ Formatting Options ──────────────────┐ ┌─ Output Destinations ─┐ │
│   ( ) Screen Display                        [X] To Printer        │
│   (·) Report                                [ ] To File           │
│   ( ) Label                                   [ ] Overwrite File  │
│      [X] Report/Label Form Name           └───────────────────────┘ │
│          GSCHAP7.FRX                                              │
│      [X] Quick Report... [ ] Overwrite                            │
│      [ ] Preview Report/Label                                     │
│      [ ] Show Summary Info Only                « OK »             │
│      [X] Eject Page Before Report                                 │
│      [ ] Report Heading                        < Cancel >         │
│                                                                   │
│      [ ] Suppress Column Headings                                 │
│      ( ) Console On (·) Console Off                               │
│          [ ] Pause Between Screens                                │
└─────────────────────────────────────────────────────────────────┘
```
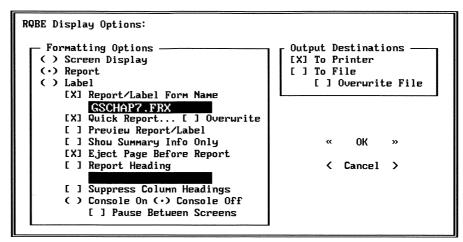
Figure 21: RQBE Display Options Dialog

```
 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
                        408/246-5353 Randy Keji      05/26/90  441.91
                        408/246-5353 Randy Keji      05/28/90  744.49
                        408/246-5353 Randy Keji      05/30/90  163.72
                        408/246-5353 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

      r Technologies    415            Mowery          05/11/90
```

Figure 22: Printed Report

More Reporting

In this session, you'll learn to format fields in reports, include totals, and add user functions to your reports.

More Reporting

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, choose the **Query** radio button then choose **OK**.

2. Make sure **TUTORIAL** appears on the **Directory** popup control then select CUSTOMER.DBF and choose **Open**. The RQBE window appears as in Figure 1.

```
┌─────────────────────────────────────────────────────────────────────────┐
│■                        RQBE  -  UNTITLED                                 │
│  Databases           Output Fields                        Output To       │
│                                                                           │
│ ►CUSTOMER          ↕   CNO          ▲  [X] Select Fields...    ┌─────────┐ │
│                    ↕   COMPANY      ◆                          │ Browse  │ │
│                    ↕   CONTACT         [ ] Order By...         └─────────┘ │
│                    ↕   ADDRESS                                            │
│                    ↕   CITY            [ ] Group By...         [ ] Options...│
│  <  Add  >         ↕   STATE        ▼  [ ] Having...                       │
│  < Clear >                                                    < See SQL  > │
│                                                               « Do Query » │
│   Field Name           NOT           Example          U≈L      Select      │
│  ┌──────────────────────────────────────────────────────────┐  Criteria   │
│  │                                                          │              │
│  │                                                          │  <Insert>    │
│  │                                                          │              │
│  │                                                          │  <Remove>    │
│  │                                                          │              │
│  │                                                          │  <  Or  >    │
│  │                                                          │              │
│  └──────────────────────────────────────────────────────────┘            │
└─────────────────────────────────────────────────────────────────────────┘
```
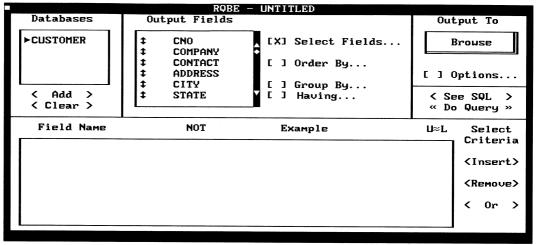
Figure 1: RQBE Window

Previously, you've specified fields to include in the query output. You'll now learn to include functions. The SUM( ) function is a 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**.

```
   Database Fields                              Selected Output
  ┌─────────────┐
  │ CUSTOMER.CNO│ ■                      → > ‡   CUSTOMER.STATE
  │ CUSTOMER.COM│ *                          ‡
  │ CUSTOMER.CON│ CUSTOMER.CNO           → > ‡
  │ CUSTOMER.ADD│ CUSTOMER.COMPANY           ‡
  │ CUSTOMER.CIT│ CUSTOMER.CONTACT           ‡
  │ CUSTOMER.STA│ CUSTOMER.ADDRESS      e > ‡
  │ CUSTOMER.ZIP│ CUSTOMER.CITY             ‡
  │ CUSTOMER.PHO│ CUSTOMER.STATE       All> ‡
  │             │ CUSTOMER.ZIP
  ┌─ Functions/ │ CUSTOMER.PHONE               [ ] No Duplicates
  │ ┌──────────┐│ CUSTOMER.ONO
  │ │ COUNT()► ││ CUSTOMER.YTDPURCH             «   OK   »
  │ │ SUM()  ► ││ CUSTOMER.LAT
  │ │ AVG()  ► ││ CUSTOMER.LONG               < Cancel >
  │ │ MIN()  ► │
  │ │ MAX()  ► │
  └─┴──────────┘
```

Functions Popup   Submenu
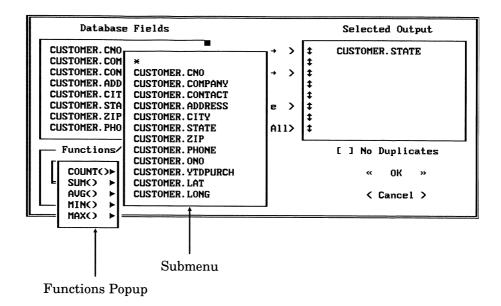
Figure 2: RQBE Select Fields Dialog

```
   Database Fields                              Selected Output
  ┌──────────────────┐
  │ CUSTOMER.CNO     │ C  < Move → >  ‡  CUSTOMER.STATE
  │ CUSTOMER.COMPANY │ C              ‡  AVG(CUSTOMER.YTDPURCH
  │ CUSTOMER.CONTACT │ C  < All →  >  ‡  COUNT(*)
  │ CUSTOMER.ADDRESS │ C              ‡  SUM(CUSTOMER.YTDPURCH
  │ CUSTOMER.CITY    │ C              ‡  MIN(CUSTOMER.YTDPURCH
  │ CUSTOMER.STATE   │ C  < Remove >  ‡  MAX(CUSTOMER.YTDPURCH
  │ CUSTOMER.ZIP     │ C              ‡
  │ CUSTOMER.PHONE   │ C  <Remove All>‡
  ┌─ Functions/Expressions ─┐         [ ] No Duplicates
  │ ┌─────────────┐         │         [ ] Cross Tabulate
  │ │  Functions  │         │
  │ └─────────────┘         │            «   OK   »
  │ ████████████████        │
  └─────────────────────────┘          < Cancel >
```

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**.

```
┌────────────────────────────────────────────────────────────────────────────┐
│      Selected Output                                    Ordering Criteria    │
│  ┌──────────────────────────┐                        ┌─────────────────────┐ │
│  │ CUSTOMER.STATE           │      < Move → >      ↕ │ ↑ CUSTOMER.STATE    │ │
│  │ AVG(CUSTOMER.YTDPURCH)│                        ↕ │                     │ │
│  │ COUNT(*)                 │      < Remove >      ↕ │                     │ │
│  │ SUM(CUSTOMER.YTDPURCH)│                        ↕ │                     │ │
│  │ MIN(CUSTOMER.YTDPURCH)│ ┌─ Order Options ─┐   ↕ │                     │ │
│  │ MAX(CUSTOMER.YTDPURCH)│ │(·) Ascending    │   ↕ │                     │ │
│  │                          │ │( ) Descending   │   ↕ │                     │ │
│  │                          │ └─────────────────┘   ↕ │                     │ │
│  │                          │                        ↕ │                     │ │
│  │                          │      «   OK   »      ↕ │                     │ │
│  │                          │                        ↕ │                     │ │
│  │                          │      < Cancel >      ↕ │                     │ │
│  └──────────────────────────┘                        └─────────────────────┘ │
└────────────────────────────────────────────────────────────────────────────┘
```
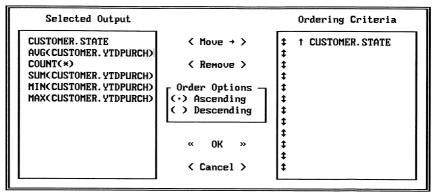
Figure 4: RQBE Order By Dialog

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)

```
┌─────────────────────────────────────────────────────────────────────┐
│    Database Fields                              Group By Fields       │
│  ┌────────────────────────┐                 ┌─────────────────────┐  │
│  │ CUSTOMER.CNO            │  < Move → >     │ ↕   CUSTOMER.STATE  │  │
│  │ CUSTOMER.COMPANY        │                 │ ↕                   │  │
│  │ CUSTOMER.CONTACT        │  < Remove >     │ ↕                   │  │
│  │ CUSTOMER.ADDRESS        │                 │ ↕                   │  │
│  │ CUSTOMER.CITY           │                 │ ↕                   │  │
│  │ CUSTOMER.STATE          │                 │ ↕                   │  │
│  │ CUSTOMER.ZIP            │                 │ ↕                   │  │
│  │ CUSTOMER.PHONE          │  «    OK    »   │ ↕                   │  │
│  │ CUSTOMER.ONO            │                 │ ↕                   │  │
│  │ CUSTOMER.YTDPURCH       │  < Cancel >     │ ↕                   │  │
│  └────────────────────────┘                 └─────────────────────┘  │
└─────────────────────────────────────────────────────────────────────┘
```
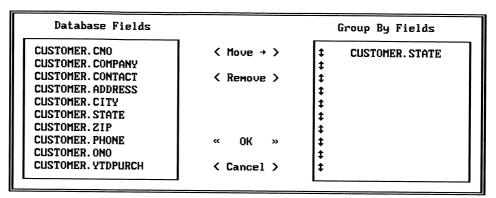
Figure 5: RQBE Group By Dialog

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

QUERY_A

Figure 6: Browse Window with Functions

That was pretty amazing, but the best is yet to come. 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.

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!

```
┌──────────────────────────────────────────────────────────────────────────┐
│        Selected Output                                    Ordering Criteria │
│    ┌───────────────────────────┐                   ┌─────────────────────┐ │
│    │ CUSTOMER.STATE            │    < Move → >     │ ↕ ↓ AVG(CUSTOMER.YTDPU│ │
│    │ AVG(CUSTOMER.YTDPURCH)    │                   │ ↕                   │ │
│    │ COUNT(*)│                 │    < Remove >     │ ↕                   │ │
│    │ SUM(CUSTOMER.YTDPURCH)    │  ┌─ Order Options ┐│ ↕                   │ │
│    │ MIN(CUSTOMER.YTDPURCH)    │  │ ( ) Ascending  ││ ↕                   │ │
│    │ MAX(CUSTOMER.YTDPURCH)    │→ │ (·) Descending ││ ↕                   │ │
│    │                           │  └────────────────┘│ ↕                   │ │
│    │                           │                   │ ↕                   │ │
│    │                           │      «   OK   »    │ ↕                   │ │
│    │                           │                   │ ↕                   │ │
│    │                           │    < Cancel >     │ ↕                   │ │
│    └───────────────────────────┘                   └─────────────────────┘ │
└──────────────────────────────────────────────────────────────────────────┘
```

Descending Radio Button →
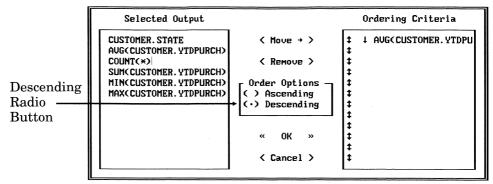
Figure 7: RQBE Order By Dialog

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

QUERY

**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.

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 TUTORIAL\GSCHAP8.FRX in the **Save as** text box in
   the RQBE Quick Report dialog. Type over any name
   that may already appear in the text box (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)

```
┌─────────────────────────────────────────────┐
│  RQBE Quick Report:                           │
│                                               │
│  (·) Column Layout        ┌─────────────────┐ │
│  ( ) Form Layout          │ Field1 Field2   │ │
│                           │ xxxxxx xxxxxx   │ │
│  Report Width  80         │ xxxxxx xxxxx    │ │
│                           └─────────────────┘ │
│  Save as  TUTORIAL\GSCHAP8.FRX                │
│                                               │
│      «    OK    »        <   Clear   >        │
│                                               │
└─────────────────────────────────────────────┘
```
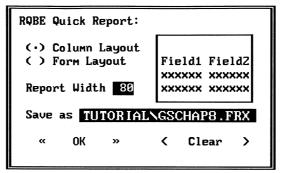
Figure 9: RQBE Quick Report Dialog

```
--------------------------------------------------------------------------
State Avg_ytdpur       Cnt        Sum_ytdpur       Min_ytdpur Max_ytdpur


AK          14820.12       1        14820.12 14820.12     14820.12
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
« Done »  < More >   Column:    0
```

Figure 10: Page Preview Window with GSCHAP8 Report

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. Make sure **TUTORIAL** shows on the **Directory** popup control and **Report** shows on the **Type** popup control.

3. Select GSCHAP8.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.
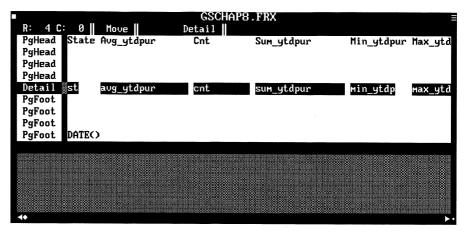
Figure 11: GSCHAP8 Report Form

Take a moment to rearrange the header information as you'd like it to appear. (Our example may look a little different than yours.)

Rearranging and Editing Fields in a Report Form

1. Edit the five abbreviated field headings:

   • Select the Avg_ytdpur heading and choose **Text** from the **Report** menu. 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.
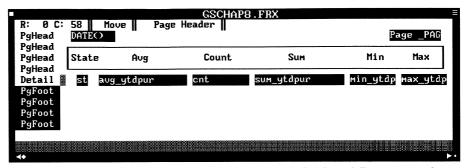
Figure 12: GSCHAP8 Report Form with Edited and Rearranged Headings and Box

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 choose 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.

```
╔══════════════════════════════════════════════╗
║                                                ║
║   Report Expression:                           ║
║                                                ║
║   <  Expr...  > avg_ytdpur                      ║
║                                                ║
║ ─ < Format... >                    Width:  16   ║
║                                                ║
║   [ ] Style...      [ ] Suppress...             ║
║   [ ] Calculate... [ ] Stretch Vertically       ║
║   [ ] Comment...    [ ] Float as Band Stretches ║
║                                                ║
║          «   OK   »    < Cancel >               ║
║                                                ║
╚══════════════════════════════════════════════╝
```

Figure 13: Report Expression Dialog

```
╔════════════════════════════════════════════════════╗
║                                                      ║
║  Format:                     Editing Options:        ║
║  999,999,999.99                                      ║
║                             ┌──────────────────────┐ ║
║  ( ) Character  (·) Numeric │ [ ] Left Justify     │ ║
║  ( ) Date       ( ) Logical │ [ ] Blank if Zero    │ ║
║                             │ [ ] (Negative)       │ ║
║                             │ [ ] Edit "SET" Date  │ ║
║                             │ [ ] British Date     │ ║
║                             │ [ ] CR if Positive   │ ║
║                             │ [ ] DB if Negative   │ ║
║                             │ [ ] Leading Zeros    │ ║
║                             │ [X] Currency         │ ║
║                             │ [ ] Scientific       │ ║
║  «   OK   »   < Cancel >    └──────────────────────┘ ║
║                                                      ║
╚════════════════════════════════════════════════════╝
```

Figure 14: Format Dialog

```
╔══════════════════════════════════════════════╗
║                                                ║
║   Report Expression:                           ║
║                                                ║
║   <  Expr...  > avg_ytdpur                      ║
║                                                ║
║   < Format... > @$ 999,999,999.99  Width:  16   ║
║                                                ║
║   [ ] Style...      [ ] Suppress...             ║
║   [ ] Calculate... [ ] Stretch Vertically       ║
║   [ ] Comment...    [ ] Float as Band Stretches ║
║                                                ║
║          «   OK   »    < Cancel >               ║
║                                                ║
╚══════════════════════════════════════════════╝
```

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 requires 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.

```
┌─────────────────────────────────────────────────┐
│ ║                                               ║ │
│ ║  Report Expression:                           ║ │
│ ║                                               ║ │
│ ║  <  Expr... >  min_ytdpur                     ║ │
│ ║                                               ║ │
│ ║  < Format... >  @$ 999,999.99      Width:  10 ║ │
│ ║                                               ║ │
│ ║  [ ] Style...     [ ] Suppress...             ║ │
│ ║  [ ] Calculate... [ ] Stretch Vertically      ║ │
│ ║  [ ] Comment...   [ ] Float as Band Stretches ║ │
│ ║                                               ║ │
│ ║        «   OK   »    < Cancel >               ║ │
│ ║                                               ║ │
└─────────────────────────────────────────────────┘
```
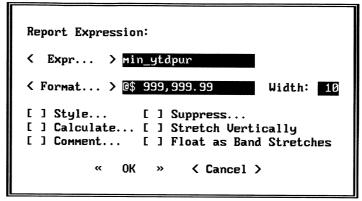
Figure 16: Report Expression Dialog

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.
>
> 2. Choose **Do Query**. The Page Preview window appears. (Figure 17)

```
 ----------------------------------------------------------------------------
  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 GSCHAP8 with Formatted Currency Fields

```
┌─────────────────────────────────────────────┐
│  ┌─────────────────────────────────────────┐ │
│  │                                         │ │
│  │   Report Title:                         │ │
│  │                                         │ │
│  │   ┌──────────────────────┐              │ │
│  │   │ [ ] Title Band       │              │ │
│  │   │ [ ] New Page         │              │ │
│  │   └──────────────────────┘   «   OK   » │ │
│  │                                         │ │
│  │   Report Summary:            < Cancel > │ │
│  │                                         │ │
│  │   ┌──────────────────────┐              │ │
│  │   │ [X] Summary Band     │              │ │
│  │   │ [ ] New Page         │              │ │
│  │   └──────────────────────┘              │ │
│  │                                         │ │
│  └─────────────────────────────────────────┘ │
└─────────────────────────────────────────────┘
```

Figure 18: Title/Summary Dialog

Summary Band

```
┌───────────────────────────────────────────────────────────────┐
│ ■                        GSCHAP8.FRX                          ≡ │
│ R:  6 C:  6 ║ Move ║      Summary ║                             │
│ PgHead   DATE()                                       Page ■    │
│ PgHead                                                          │
│ PgHead   State    Avg          Count        Sum      Min    Max │
│ PgHead                                                          │
│ Detail ▓  st  avg_ytdpur    cnt     sum_ytdpur  min_ytdpur max_ytd│
│ PgFoot                                                          │
│ Summary▓                                                        │
│                                                                 │
│                                                                 │
│                                                                 │
│ ◄♦                                                          ►•  │
└───────────────────────────────────────────────────────────────┘
```

Figure 19: GSCHAP8 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 **Count** 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.

```
┌──────────────────────────── GSCHAP8.FRX ─────────────────────────────┐
│ ■                                                                   ≡ │
│ R:  0 C:  0 ║ Move ║   Page Header ║                                  │
│ PgHead   DATE()                                              Page     │
│ PgHead                                                                │
│ PgHead   State      Avg           Count        Sum         Min    Max │
│ PgHead                                                                │
│ Detail ▓  st  avg_ytdpur      cnt     sum_ytdpur    min_ytdpur max_ytd│
│ PgFoot                                                                │
│ Summary▓                                                              │
│ Summary▓       avg_ytdpur      cnt     sum_ytdpur    min_ytdpur max_ytd│
│                                                                       │
│ ◄◆                                                                ►·  │
└───────────────────────────────────────────────────────────────────────┘
```
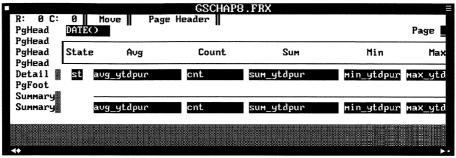
**Figure 20: GSCHAP8 Report Form with Added
Summary Band and Copied Fields**

```
┌──────────────────────────────────────────────────────┐
│                                                        │
│   Reset:        ┌──────────────────┐                   │
│                 │  End of Report  ║                     │
│                 └──────────────────┘                   │
│                                                        │
│   Calculate:  ┌──────────────────┐                     │
│               │ ( ) Nothing      │                     │
│               │ ( ) Count        │    «   OK   »        │
│               │ ( ) Sum          │                     │
│               │ (•) Average      │   < Cancel >         │
│               │ ( ) Lowest       │                     │
│               │ ( ) Highest      │                     │
│               │ ( ) Std. Deviation│                    │
│               │ ( ) Variance     │                     │
│               └──────────────────┘                     │
│                                                        │
└──────────────────────────────────────────────────────┘
```
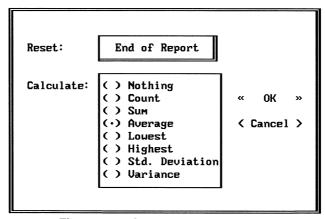
Figure 21: Calculate Field Dialog

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.

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
 VT    $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
 NV    $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
       _____

       $3,337.06       500 $1,663,206.74       $18.16 $17,777.06




 « Done »  < More >   Column:    0
◀◆                                                               ▶
```

Figure 22: Page Preview of GSCHAP8 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. Right now, take a look at the command that is behind the fantastic things you have been doing with RQBE.

> **Looking at the SELECT Command**
>
> Choose the **See SQL** push button in the RQBE window. The See SQL window appears as in Figure 24.

You've created a SQL SELECT command without programming.

```
┌─────────────────────────────────────────────────────────────────────┐
│ ■                        RQBE  -  UNTITLED                            │
│   Databases        Output Fields                        Output To     │
│                                                                       │
│ ►CUSTOMER        ↕     STATE       [X] Select Fields...  ┌───────────┐ │
│                  ↕ 1↓  AVG(YTDPURCH                      │Report/Label│ │
│                  ↕     COUNT(*)    [X] Order By...       └───────────┘ │
│                  ↕     SUM(YTDPURCH                                    │
│                  ↕     MIN(YTDPURCH [X] Group By...      [X] Options... │
│   <  Add  >      ↕     MAX(YTDPURCH [ ] Having...                      │
│   < Clear >                                             < See SQL  > ──┤
│                                                         « Do Query »   │
│   Field Name          NOT          Example         U≈L     Select     │
│ ┌───────────────────────────────────────────────────┐    Criteria    │
│ │                                                     │               │
│ │                                                     │    <Insert>    │
│ │                                                     │               │
│ │                                                     │    <Remove>    │
│ │                                                     │               │
│ │                                                     │    <  Or  >    │
│ │                                                     │               │
│ └───────────────────────────────────────────────────┘               │
└─────────────────────────────────────────────────────────────────────┘
```
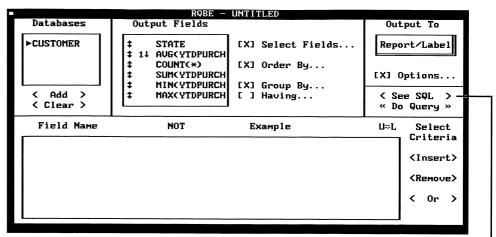
Figure 23: RQBE Window

```
┌─────────────────────────────────────────────────────────────────────┐
│ ■                     UNTITLED.QPR [Read Only]                     ≡  │
│ SELECT CUSTOMER.STATE, AVG(CUSTOMER.YTDPURCH), COUNT(*),;             │
│   SUM(CUSTOMER.YTDPURCH), MIN(CUSTOMER.YTDPURCH), MAX(CUSTOMER.YTDPURCH);│
│  FROM CUSTOMER;                                                       │
│  GROUP BY CUSTOMER.STATE;                                             │
│  ORDER BY 2 DESCENDING;                                               │
│  INTO CURSOR QUERY                                                    │
│ CREATE REPORT SESSION5.FRX FROM QUERY WIDTH 80 COLUMN NOOVERWRITE     │
│ REPORT FORM SESSION5.FRX TO PRINTER NOCONSOLE                         │
│                                                                       │
│ ◄◆                                                               ►◆   │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 24: SELECT Command

You have worked hard and created a wonderful report. Save your report.

Saving the Report

1. Close the See SQL window.

2. Choose **Save as...** from the **File** menu popup and make sure **TUTORIAL** appears on the **Directory** popup control. Type GSCHAP8 in the text box then choose **Save**.

3. Close the RQBE window.

4. Close the GSCHAP8 report form and choose **Yes** when FoxPro asks about saving changes.

RQBE and the Report Writer in Action

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

Analyzing Data

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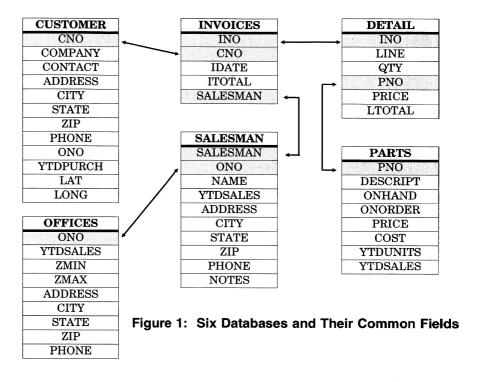
In this session you'll see RQBE and the Report Writer used to perform a sales analysis. RQBE enables you to extract data from several databases and the Report Writer allows even more refined reporting.

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.

CUSTOMER
CNO
COMPANY
CONTACT
ADDRESS
CITY
STATE
ZIP
PHONE
ONO
YTDPURCH
LAT
LONG

OFFICES
ONO
YTDSALES
ZMIN
ZMAX
ADDRESS
CITY
STATE
ZIP
PHONE

INVOICES
INO
CNO
IDATE
ITOTAL
SALESMAN

SALESMAN
SALESMAN
ONO
NAME
YTDSALES
ADDRESS
CITY
STATE
ZIP
PHONE
NOTES

DETAIL
INO
LINE
QTY
PNO
PRICE
LTOTAL

PARTS
PNO
DESCRIPT
ONHAND
ONORDER
PRICE
COST
YTDUNITS
YTDSALES

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. Make sure that **TUTORIAL** appears on the **Directory** popup control and **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 ─────────────────────────┐
■ Databases        Output Fields                      Output To
  ┌──────────┐    ┌─────────────┐                    ┌──────────┐
  │▶INVOICES │    │ ↕  SALESMAN │  [X] Select Fields... │ Browse │
  │          │    │ ↕  SUM(ITOTAL)│                   └──────────┘
  │          │    │ ↕           │  [ ] Order By...    STEP1
  │          │    │ ↕           │                     [ ] Options...
  │          │    │ ↕           │  [X] Group By...    ┌──────────┐
  │ < Add >  │    │ ↕           │  [ ] Having...      │< See SQL >│
  │ < Clear >│    └─────────────┘                     │« Do Query »│
  └──────────┘                                        └──────────┘

   Field Name        NOT        Example        Options    Select
  ┌──────────────────────────────────────────────────┐  Criteria
  │                                                    │
  │                                                    │  <Insert>
  │                                                    │
  │                                                    │  <Remove>
  │                                                    │
  │                                                    │  <  Or  >
  └──────────────────────────────────────────────────┘
```

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  │                              │ │
└──────────┴────────────┴──────────────────────────────┘
```
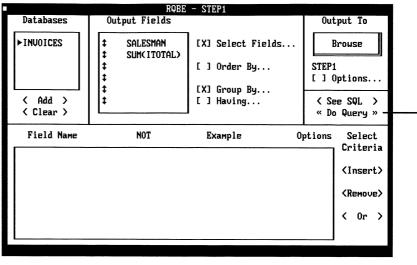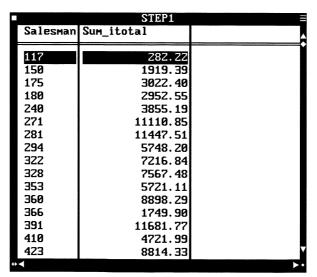
Figure 3: Step1 Query Results in
a Browse Window

Suppose that you want to break this information down by the office in which the salespeople 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.

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.

```
┌────────────────────────── RQBE - STEP2 ───────────────────────────┐
│ Databases        Output Fields                         Output To   │
│                                                                    │
│ ▶INVOICES      ‡   ONO            [X] Select Fields...  ┌─────────┐ │
│  SALESMAN      ‡   SALESMAN                             │ Browse  │ │
│                ‡   SUM(ITOTAL)    [ ] Order By...       └─────────┘ │
│                ‡                                        STEP2       │
│                ‡                  [X] Group By...       [ ] Options...│
│  < Add  >      ‡                  [ ] Having...                     │
│  < Clear >                                             < See SQL >  │
│                                                        « Do Query » │
│                                                                    │
│   Field Name            NOT         Example       Options   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.
>
> 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. 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 ────────────────────────┐
│  Databases        Output Fields                    Output To  │
│                                                               │
│ ►INVOICES      ↕   CITY        [X] Select Fields...  ┌───────────┐
│  SALESMAN      ↕   ONO                               │Report/Label│
│  OFFICES       ↕   SALESMAN    [ ] Order By...       └───────────┘
│                ↕   NAME                                        │
│                ↕   SUM(ITOTAL) [X] Group By...     [X] Options...│
│  < Add  >      ↕               [ ] Having...                   │
│  < Clear >                                         < See SQL  >│
│                                                    « Do Query »│
│                                                               │
│  Field Name           NOT          Example       Options  Select│
│                                                           Criteria│
│ ↕ SALESMAN.SALESMAN   [ ] Like    INVOICES.SALESMAN  [ ] │
│ ↕ OFFICES.ONO         [ ] Like    SALESMAN.ONO       [ ] │ <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  o city          sal name           sum_itotal         │
│ L1-ono                                      ──────────         │
│ L1-ono                                      sum_itotal         │
│ 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.

Notice that the Report Writer allows 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

Closing the RQBE Window

1. Choose **Done** to return to the RQBE window.

2. Close the RQBE window.

```
┌──────────────────────────────────────────────────────────────────────┐
│ ■                                                                      │
│ ------------------------------------------------------------------     │
│      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 Townsend        2,952.55          │
│                                                      _____          │
│                                                      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          │
│                                                      _____          │
│                                                     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. 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 ────────────────────────────┐
│  Databases        Output Fields                        Output To       │
│                                                                        │
│  ►INVOICES        ↕   CITY        ▲  [X] Select Fields...  ┌─────────┐ │
│   SALESMAN        ↕   ONO         ◆                        │Report/Label│
│   OFFICES         ↕   SALESMAN       [ ] Order By...       └─────────┘ │
│   CUSTOMER        ↕   NAME                                             │
│                   ↕   COMPANY        [X] Group By...      [X] Options...│
│  < Add  >         ↕   SUM(ITOTAL) ▼  [ ] Having...                     │
│  < Clear >                                                < See SQL  > │
│                                                           « Do Query » │
│  ───────────────────────────────────────────────────────────────────  │
│   Field Name            NOT          Example        Options   Select    │
│                                                               Criteria  │
│  ↕ SALESMAN.SALESMAN   [ ] Like   INVOICES.SALESMAN   [ ]               │
│  ↕ OFFICES.ONO         [ ] Like   SALESMAN.ONO        [ ]    <Insert>   │
│  ↕ CUSTOMER.CNO        [ ] Like   INVOICES.CNO        [ ]               │
│                                                             <Remove>    │
│                                                                         │
│                                                             <  Or  >    │
│                                                                         │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 9: STEP4.QPR
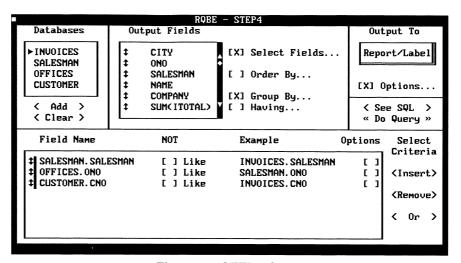
Opening STEP4.FRX

1. Choose **Open...** from the **File** menu. 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.

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

Closing the RQBE Window

1. Choose **Done** to return to the RQBE window.

2. Close the RQBE window.

```
 ■                            STEP4.FRX                              ≡
 R:  0 C:   0 ║ Move ║  Page Header ║
 PgHead       Office              Salesman         Customer
 PgHead
┌1-ono
 Detail   o city          sal name               company              s
└1-ono
└1-ono                                                                 s
└1-ono
 PgFoot
 PgFoot   DATE()
 Summary
 Summary
 Summary                                          Total Sales All Offices  s
```
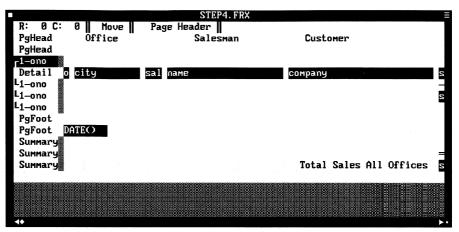
Figure 10: STEP4 Report in Report Layout Window

```
 ■
-----------------------------------------------------------------------------
   Office            Salesman            Customer            Total Sal

1 Boston        117 Janet A. McCarthy   Snow Aerial Realtors      282.
                150 Robert Watters      Balance Computing Systems 480.
                                        Posna Associates          441.
                                        Silicon Computer Calgary  996.
                175 Doris Dupuy         Award Ammonia Greenhouses 175.
                                        A. Arts Computers       1,493.
                                        Print Mayo Consultation 1,353.
                180 T Staziola Townsend Boehringer PCA          1,282.
                                        Ross & Associates Products 1,670.
                                                                ---------
                                                                8,176.

2 New York      240 John Hodge          Systems Poetics and       756.
                                        The Circle Distributing 2,086.
                                        Wilson Solutions        1,012.
                271 Howard Schneider     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. Make sure **Query** is showing on the **Type** popup control.

2. Open STEP5.QPR. The RQBE window appears as in Figure 12.

```
┌────────────────────────────────────────────────────────────────────┐
│■                        RQBE - STEP5                                 │
│  Databases        Output Fields                        Output To     │
│                                                                      │
│ ▶SALESMAN ▲    ↕ 1↑ CITY      ▲  [X] Select Fields...  ┌───────────┐ │
│  OFFICES  ◆    ↕ 2↑ NAME      ◆                        │Report/Label│ │
│  INVOICES      ↕    CNO          [X] Order By...       └───────────┘ │
│  CUSTOMER ▼    ↕ 3↑ COMPANY                            [X] Options...│
│                ↕ 4↑ INO          [ ] Group By...                     │
│  ‹ Add  ›      ↕ 5↑ DESCRIPT  ▼  [ ] Having...         ‹ See SQL  ›  │
│  ‹ Clear ›                                             « Do Query » │
│                                                                      │
│  Field Name          NOT          Example        Options   Select    │
│                                                            Criteria   │
│ ↕ OFFICES.ONO       [ ] Like    SALESMAN.ONO       [ ]               │
│ ↕ INVOICES.SALESMAN [ ] Like    SALESMAN.SALESMAN  [ ]    ‹Insert›   │
│ ↕ CUSTOMER.CNO      [ ] Like    INVOICES.CNO       [ ]               │
│ ↕ DETAIL.INO        [ ] Like    INVOICES.INO       [ ]    ‹Remove›   │
│ ↕ PARTS.PNO         [ ] Like    DETAIL.PNO         [ ]               │
│                                                           ‹  Or  ›   │
│                                                                      │
└────────────────────────────────────────────────────────────────────┘
```

Figure 12: STEP5.QPR

Opening STEP5.FRX

1. Choose **Open...** from the **File** menu. 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.

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.

Closing the RQBE Window and Databases

1. Choose **Done** to return to the RQBE window.

2. Close the RQBE window.

3. Hold down the Shift key and choose **Close All** from the **File** menu to close all open databases.

```
┌─────────────────────────────────────── STEP5.FRX ──────────────────────────────┐
│ R:  0 C:   0 ║ Move ║   Page Header ║                                          │
│ PgHead                                                                          │
│ ┌1-city                                                                         │
│ ┌1-city                               SALES OFFICE: city                        │
│ ┌1-city                                                                         │
│ ┌1-city                                                                         │
│ ┌1-city   Office      Company Name              Inv#  Item Description     Qty   │
│ ┌1-city                                                                         │
│ ┌1-city                                                                         │
│ ┌2-name                                                                         │
│ ┌2-name                                                                         │
│ ┌2-name     SALES ACTIVITY FOR name                                            │
│ ┌2-name                                                                         │
│ ┌2-name                                                                         │
│ ┌3-compa                                                                        │
│ ┌4-ino                                                                          │
│ Detail   city          company               ino   descript              qty    │
│ L4-ino                                                                          │
│ L4-ino                                                                    qty    │
│ L4-ino                                                                          │
│ L3-compa                               TOTAL FOR company                  qty    │
│ L3-compa                                                                        │
└─────────────────────────────────────────────────────────────────────────────────┘
```
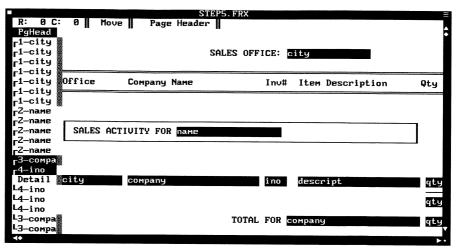
Figure 13: STEP5 Report in Report Layout Window

```
┌─────────────────────────────────────────────────────────────────────────────────┐
│                                                                                 │
│                         SALES OFFICE: Atlanta                                   │
│                                                                                 │
│ Office      Company Name           Inv#  Item Description     Qty  Price         │
│                                                                                 │
│                                                                                 │
│   SALES ACTIVITY FOR E. Faulkner                                                │
│                                                                                 │
│ Atlanta      First Computer        1142  Cursive initial        4     34.        │
│                                          Defeat card            5     11.        │
│                                          Holst rain             6      8.        │
│                                          Runty river            2    122.        │
│                                          Skimpy armchair        4     29.        │
│                                          Soiree ink             2     11.        │
│                                          Suit bead              1    130.        │
│                                          Sulfate images         1     27.        │
│                                          Woodyard lizard        1     98.        │
│ « Done »  < More >   Column:    0                                               │
└─────────────────────────────────────────────────────────────────────────────────┘
```
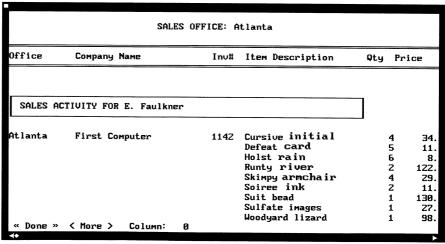
Figure 14: STEP5 Report in Page Preview Window

Working With Your Own Database

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

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 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 comments about your wine.

Go ahead and start building a database called CELLAR.

Creating a Database Structure

1. Choose **New...** from the **File** menu. 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)

```
New:

    (·) Database
    ( ) Program
    ( ) File
    ( ) Index            «    OK    »
    ( ) Report
    ( ) Label          < Cancel >
    ( ) Screen
    ( ) Menu
    ( ) Query
    ( ) Project
```

Figure 1: New File Dialog

```
Structure: Untitled
        Name            Type      Width Dec
                                             Field

                                           <Insert>

                                           <Delete>



                                           «   OK   »

                                           <Cancel>

 Fields:   0      Length:    1    Available: 3999
```
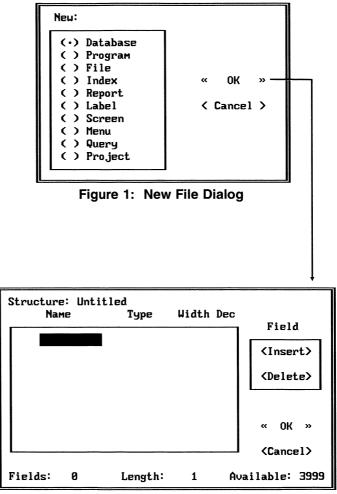
Figure 2: Structure Dialog

Each row in the Structure dialog represents information for one field. The cursor appears in the **Name** text box for the first row so you can define the first field. 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 File Menu chapter in the FoxPro *User's 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** text box; press Tab to move to the **Type** popup (**Character** appears on the **Type** popup control by default); Tab to the **Width** text box and type `20`; skip the **Dec** text box.

   The **Dec** text box determines how many spaces after the decimal are required. Since COST and PVALUE are currency fields, a **Dec** value of 2 should be used.

2. Using Figure 3 as a guide, define the remaining fields. To move to each field, press Tab or point to the field and click. To display the **Type** popup, Tab to the **Type** popup control and press Enter or point to the field with the mouse and click.

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. Make sure **TUTORIAL** shows on the **Directory** popup control. 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**.

```
Structure: Untitled
        Name          Type      Width Dec
                                                Field
    ↕ WINERY        Character      20
    ↕ TYPE          Character      10          <Insert>
    ↕ FLAVOR        Character      15
    ↕ ORIGIN        Character      20          <Delete>
    ↕ DPURCH        Date            8
    ↕ DCORK         Date            8
    ↕ COST          Numeric        10   2
    ↕ PVALUE        Numeric        10   2      «  OK  »
    ↕ COMMENTS      Memo           10

                                            <Cancel>

Fields:   9       Length:  112      Available: 3888
```
_____ Status Line

Figure 3: Structure Dialog with Field Information

```
Name the new database:

►[..]                        Drive     C
 CUSTOMER.DBF
 DETAIL.DBF
 INVOICES.DBF
 OFFICES.DBF              Directory  TUTORIAL
 PARTS.DBF
 SALESMAN.DBF
                                    «  Save  »

 [ ] All Files              < Cancel >

CELLAR
```

Figure 4: Save As Dialog

```
        Input data records now?


«   Yes    »                      <   No   >
```

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 /. This is entered 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+PgDn 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 Ellen`. 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.

```
┌─────────────────────────────────────┐  ┌──────────────────────────────┐
│■            CELLAR             ≡│  │      CELLAR.COMMENTS         │
│ Winery   Mogen David          ┌──┐│  │ This was a gift from Bert.   │
│ Type     Generic              │  │▲│  │                              │
│ Flavor   Concord          ┌───┘  │◆│  │                              │
│ Origin   ?            ∘    │      │ │  │                              │
│ Dpurch   02/12/91         │      │ │  │                              │
│ Dcork      /  /                  │ │  │                              │
│ Cost            3.59             │ │  │                              │
│ Pvalue          3.59             │ │  │                              │
│ Comments Memo                       │  │                              │
│ ──────────────────────────────── │  │                              │
│ Winery   MD 20/20                   │  │                              │
│ Type     Generic                    │  │                              │
│ Flavor   Grape                      │  │                              │
│ Origin   ?                          │  │                              │
│ Dpurch   03/23/91                   │  │                              │
│ Dcork      /  /                     │  │                              │
│ Cost            3.25                │  │                              │
│ Pvalue          3.25             ▼│  │                              │
│ Comments Memo                       │  │                              │
│↔                                 •│  └──────────────────────────────┘
└─────────────────────────────────────┘
```

Figure 6: CELLAR.DBF

```
┌─────────────────────────────────────┐  ┌──────────────────────────────┐
│■            CELLAR             ≡│  │      CELLAR.COMMENTS         │
│ Winery   Mogen David                │  │ This was a gift from Ellen.  │
│ Type     Generic                  ▲│  │                              │
│ Flavor   Concord                  ◆│  │                              │
│ Origin   ?                          │  │                              │
│ Dpurch   02/12/91                   │  │                              │
│ Dcork      /  /                     │  │                              │
│ Cost            3.59                │  │                              │
│ Pvalue          3.59                │  │                              │
│ Comments Memo                       │  │                              │
│ ──────────────────────────────── │  │                              │
│ Winery   MD 20/20                   │  │                              │
│ Type     Generic                    │  │                              │
│ Flavor   Grape                      │  │                              │
│ Origin   ?                          │  │                              │
│ Dpurch   03/23/91                   │  │                              │
│ Dcork      /  /                     │  │                              │
│ Cost            3.25                │  │                              │
│ Pvalue          3.25             ▼│  │                              │
│ Comments Memo                       │  │                              │
│↔                                 •│  └──────────────────────────────┘
└─────────────────────────────────────┘
```

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.

Adding Records to a Database

1. Choose **Append** from the **Record** menu. 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        ║
                                   ▲        ║ Present from Mom and Dad.     ║
  Winery    Boone's                         ║                               ║
  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    08/22/89                        ║                               ║
  Dcork     01/01/87                        ║                               ║
  Cost          11.36                       ║                               ║
  Pvalue        17.95                ▼       ║                               ║
  Comments  Memo                            ║                               ║
↔                                           ║                               ║
```

Figure 8: CELLAR.DBF

```
■              CELLAR              ≡        ║        CELLAR.COMMENTS        ║
                                   ▲        ║ My first real investment.     ║
  Winery    Boone's                         ║                               ║
  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    08/22/89                        ║                               ║
  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. 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:

   • With the keyboard choose **Insert Field** from the **Structure** menu.

   • With the mouse, 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; skip the **Dec** text box.

Modify Push Button

```
╔═══════════════════════════════════════════════════════════════════╗
║                    ↓Database: C:\FOXPRO25\TUTORIAL\CELLAR.DBF       ║
║      Structure:   <Modify>            Indexes:            Index     ║
║   ┌─────────────────────────┐ ┌─────────────────┐ ┌─────────────┐  ║
║   │►WINERY      C │ 20 │ 0   │ │                 │ │             │  ║
║   │ TYPE        C │ 10 │ 0   │ │                 │ │ < Add...  > │  ║
║   │ FLAVOR      C │ 15 │ 0   │ │                 │ │             │  ║
║   │ ORIGIN      C │ 20 │ 0   │ │                 │ │ <Modify...> │  ║
║   │ DPURCH      D │  8 │ 0   │ │                 │ │             │  ║
║   │ DCORK       D │  8 │ 0   │ │                 │ │ < Remove  > │  ║
║   │ COST        N │ 10 │ 2   │ │                 │ │             │  ║
║   │ PVALUE      N │ 10 │ 2   │ │                 │ │ <No Order > │  ║
║   │ COMMENTS    M │ 10 │ 0   │ │                 │ │             │  ║
║   └─────────────────────────┘ └─────────────────┘ └─────────────┘  ║
║    Fields:    9 Length: 112     Index expr:                        ║
║                                 Index filter:                      ║
║   [X] Set Fields...                                                ║
║       ( ) On (·) Off                                «    OK    »    ║
║   [ ] Filter...                                                    ║
║   [ ] Format...                                                    ║
╚═══════════════════════════════════════════════════════════════════╝
```
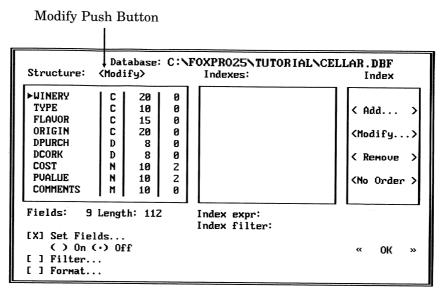
Figure 10: Setup Dialog with CELLAR.DBF Information

```
╔═══════════════════════════════════════════════════════════════════╗
║      Structure: C:\FOXPRO25\TUTORIAL\CELLAR.DBF                     ║
║              Name          Type      Width Dec                     ║
║                                                        Field       ║
║   ┌──────────────────────────────────────────┐   ┌─────────────┐  ║
║   │ ↕ WINERY       Character    20 │ ▲ ◆      │   │ <Insert>    │  ║
║   │ ↕ TYPE         Character    10 │          │   │             │  ║
║   │►↕ CLASS        Character    15 │          │   │ <Delete>    │  ║
║   │ ↕ ORIGIN       Character    20 │          │   └─────────────┘  ║
║   │ ↕ DPURCH       Date          8 │          │                    ║
║   │ ↕ DCORK        Date          8 │          │                    ║
║   │►↕ NEWFIELD     Character    10 │          │   «    OK    »     ║
║   │ ↕ COST         Numeric      10 │ 2        │                    ║
║   │ ↕ PVALUE       Numeric      10 │ 2 ▼      │   <Cancel>         ║
║   └──────────────────────────────────────────┘                    ║
║    Fields:   10        Length:    122      Available: 3878         ║
╚═══════════════════════════════════════════════════════════════════╝
```

Changed Field

New Field
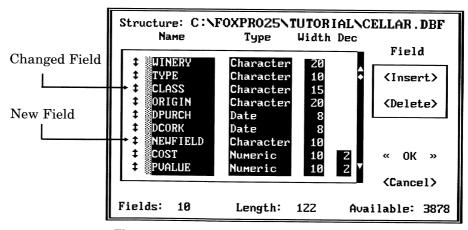
**Figure 11: Structure Dialog Showing Initial Changes
to CELLAR.DBF**

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)

Custom Database

Structure: C:\FOXPRO25\TUTORIAL\CELLAR.DBF

	Name	Type	Width	Dec
↕	WINERY	Character	20	
↕	TYPE	Character	10	
↕	CLASS	Character	15	
↕	ORIGIN	Character	20	
↕	DPURCH	Date	8	
↕	DCORK	Date	8	
↕	DCONSUM	Date	8	
↕	RATING	Numeric	1	0
↕	COST	Numeric	10	2

Field

<Insert>

<Delete>

« OK »

<Cancel>

Fields: 11   Length: 130   Available: 3870

Figure 12: Structure Dialog with Changes

Make structure changes permanent?

« Yes »   < No >

Figure 13: Structure Changes Alert

Database: C:\FOXPRO25\TUTORIAL\CELLAR.DBF

Structure: <Modify>   Indexes: Index

►WINERY	C	20	0	
TYPE	C	10	0	
CLASS	C	15	0	
ORIGIN	C	20	0	
DPURCH	D	8	0	
DCORK	D	8	0	
DCONSUM	D	8	0	
RATING	N	1	0	
COST	N	10	2	

< Add... >

<Modify...>

< Remove >

<No Order >

Fields: 11 Length: 121   Index expr:
                                Index filter:

[X] Set Fields...
    ( ) On (·) Off   « OK »
[ ] Filter...
[ ] Format...

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.

   An alert may appear (Figure 15) to tell you that the default browse setup will be used. Your next keystroke or mouse movement will remove the alert from your screen.

3. Size the Browse window so it stretches across your screen as shown in Figure 16.

Custom Database

```
┌──────────────────────────────────────────────────────┐
║                                                        ║
║      Invalid BROWSE setup -- default setup used        ║
║                                                        ║
║                                                        ║
└──────────────────────────────────────────────────────┘
```

Figure 15: Default Browse Setup Alert

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/
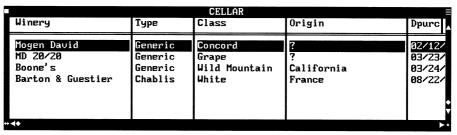
Figure 16: CELLAR.DBF

Notice the column between the fields and the window border. (Figure 17) A bullet (•) appears in this delete/recall column when you mark a record for deletion.

Go ahead and mark two 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. A bullet 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 bullet 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 want to get rid of are marked for deletion.
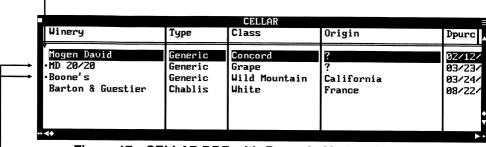
Suppose you change your mind about deleting one of the records you have marked. Let's go in and unmark it.

Recalling a Record Marked for Deletion

With the keyboard:

1. Press the Up Arrow or Down Arrow to select the record with the winery name "Boone's."

2. Choose **Toggle Delete** from the **Browse** menu. The bullet in the delete/recall column disappears. (Figure 18)

With the mouse:

Point to the bullet next to "Boone's" in the delete/recall column and click. The bullet disappears. (Figure 18)

Custom Database

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 permanently remove the record marked for deletion.

Packing the Database

1. Choose **Pack** from the **Database** menu. 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.

2. Look for the record for MD 20/20. It is gone. (Figure 20)

Custom Database

Pack C:\FOXPRO25\TUTORIAL\CELLAR.DBF?

«   Yes   »   <   No   >

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/
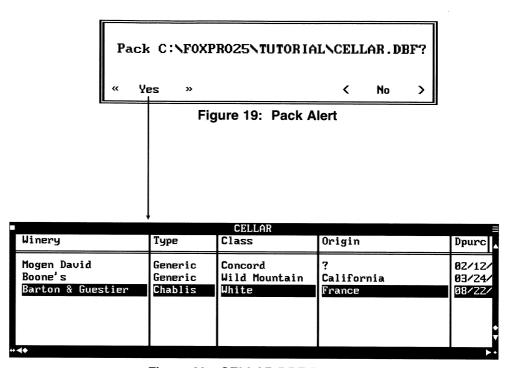
Figure 20: CELLAR.DBF Packed

Editing the data in your database is easy, too.

Editing Data in the Database

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

2. Close the Browse window.

You now know how to create and manipulate a database so that it meets your specific needs.

Custom Database

Field changed from Concord to Concord Grape

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
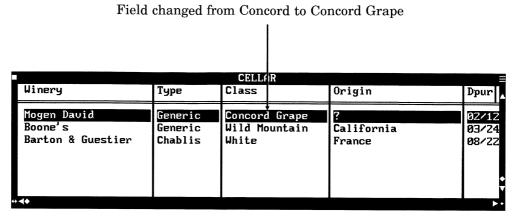
Figure 21: CELLAR.DBF with Edited Field

Designing a Custom Input Screen

In this session, you will use the Screen Builder to design your own custom input screen.

Creating a Screen

Designing a Custom Input Screen

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, choose the **Screen** radio button, then choose **OK**. An untitled Screen Design window appears. (Figure 1)

3. Choose **Quick Screen...** from the **Screen** menu. 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)

```
┌──────────────────── UNTITLED.SCX ─────────────────────┐
│  R:   0 C:   0 ║        Move ║                        ▲│
│                                                       ▼│
│◄◆                                                   ►·│
└────────────────────────────────────────────────────────┘
```
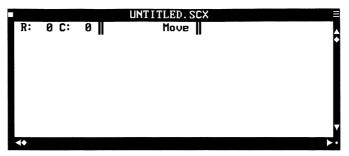
Figure 1: Screen Design Window

```
┌────────────────────────────────────────────┐
│                                              │
│  Quick Screen:                               │
│                                              │
│    ( ) By Column Layout                      │
│    (·) By Row Layout        ┌──────────────┐ │
│                             │ Field1 xxxxxx│ │
│    [X] Titles               │ Field2 xxxxxx│ │
│    [ ] Fields...            │ Field3 xxxxxx│ │
│    [X] Add Alias            │ Field4 xxxxxx│ │
│    [ ] Memory variables     └──────────────┘ │
│                                              │
│    Maximum field width:  ▓80▓                │
│                                              │
│       «   OK   »    < Cancel >               │
│                                              │
└────────────────────────────────────────────┘
```

Figure 2: Quick Screen Dialog

```
┌──────────────────── UNTITLED.SCX ─────────────────────┐
│  R:   4 C:  45 ║        Move ║                        ▲│
│Winery      1:  winery..........                        │
│Type        2:  type...                                 │
│Class       3:  class.......                            │
│Origin      4:  origin..........                        │
│Dpurch      5:  dpurc                                   │
│Dcork       6:  dcork                                   │
│Dconsum     7:  dcons                                   │
│Rating      8:                                          │
│Cost        9:  cost...                                 │
│Pvalue     10:  pvalue                                  │
│Comments   11:  comments.............................   │
│◄◆                                                   ►·│
└────────────────────────────────────────────────────────┘
```

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. The Screen Layout dialog appears.

2. Choose the **Window** radio button at the top of the Screen Layout dialog. (Figure 4)

3. Type `Wine Collecting 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 to specify the size of the window you're creating (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**.

Choosing the **Window** radio button gives your screen the same features as any FoxPro window including sizing and moving. The Window Type dialog from steps 5 and 6 displays all available window options.

The **Desktop** option creates a static screen without borders, title, name or any window type options.

The **Height** and **Width** text boxes allow you to define the size of your screen. The unit of measurement equals one character.

Window Radio Button

Title Text
Box

Height/Width
Text Boxes

```
( ) DeskTop                        (·) Window

Name:                              <Type...>
Title:  Wine Collecting Is My Hobby
Footer:

Size:          Screen Code:

 Height:    15   [ ] Setup...              «   OK   »
 Width:     64   [ ] Cleanup & Procs...

Position:      READ Clauses:              < Cancel >

 Row:           [ ] Activate...   [ ] Show...
 Column:        [ ] Valid...      [ ] When...
 [X] Center     [ ] Deactivate...

Environment:                      [X] Add alias

 <   Save   >     < Restore >     < Clear  >
```
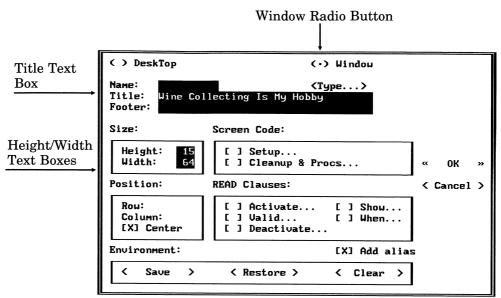
Figure 4: Screen Layout Dialog

Type Popup

```
Type:  [    User
            System
            Dialog
            Alert

Attribut        order:

 [ ] Close      ( ) None
 [ ] Float      (·) Single
 [X] Shadow     ( ) Double    «   OK   »
 [ ] Minimize   ( ) Panel
                ( ) System    < Cancel >

Color Schemes:

 Primary:       Popup:

 User Winds     User Menus
```
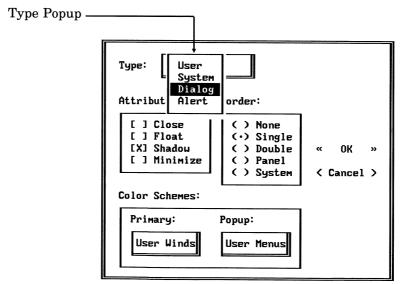
Figure 5: Window Type Dialog

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. 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.

```
R:  0 C:  0 ‖           Move ‖
┌──────────Wine Collecting Is My Hobby──────────┐
│Winery     1: winery..........                  │
│Type       2: type...                           │
│Class      3: class......                        │
│Origin     4: origin..........                   │
│Dpurch     5: dpurc                              │
│Dcork      6: dcork                              │
│Dconsum    7: dcons                              │
│Rating     8                                     │
│Cost       9: cost...                            │
│Pvalue    10: pvalue                             │
│Comments  11: comments..................................│
│                                                 │
└─────────────────────────────────────────────┘
```
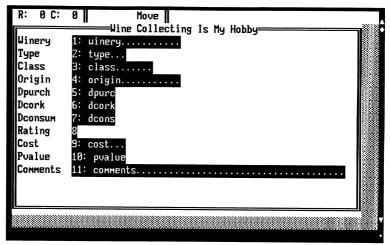
Figure 6: Screen Design Window

```
R:  0 C:  0 ‖           Move ‖
┌──────────Wine Collecting Is My Hobby──────────┐
│ Winery 1: winery..........      Origin 4: origin..........  │
│                                                 │
│  Type 2: type...    Class 3: class......        Rating 8   │
│                                                 │
│ Pvalue 10: pvalue                               │
│   Cost 9: cost...                               │
│                        Dcork 6: dcork           │
│                        Dpurch 5: dpurc          │
│                        Dconsum 7: dcons         │
│                                                 │
│Comments   11: comments..................................│
│                                                 │
└─────────────────────────────────────────────┘
```
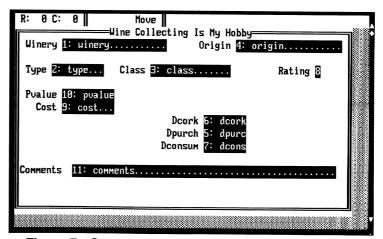
**Figure 7: Screen Design Window with Moved Fields
and Field Titles**

It might look better 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. 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.

Creating a Screen
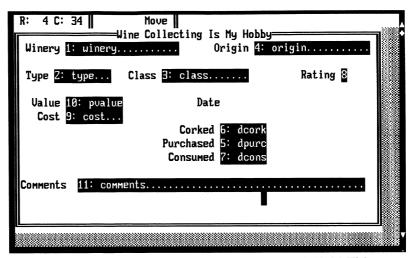
Figure 8: Screen Design Window with Edited Field Titles

Draw 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:

- 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.

Creating a Screen
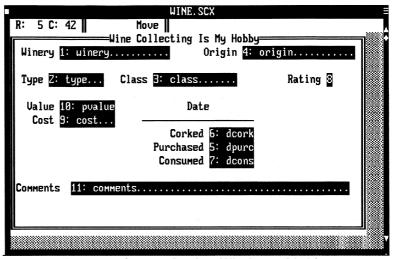
Figure 9: Screen Design Window with Line

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:

   - With the keyboard, place the cursor on COMMENTS and double-click with the Spacebar.

   - With the mouse, point to COMMENTS and double-click.

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 and hold on the field so that it blinks. Drag until the field is the desired size.

Edit Radio Button

```
┌─────────────────────────────────────────────────────────┐
│ ╔═══════════════════════════════════════════════════════╗│
│ ║ Field:                                                ║│
│ ║ ┌───────────────────────────────────────────────────┐ ║│
│ ║ │ ( ) Say         ( ) Get         (•) Edit          │ ║│
│ ║ └───────────────────────────────────────────────────┘ ║│
│ ║                                                       ║│
│ ║ <  Edit...  > cellar.comments                         ║│
│ ║                                              «   OK   »║│
│ ║ < Format... >                                         ║│
│ ║                                              < Cancel >║│
│ ║ Range:                                                ║│
│ ║ ┌───────────────────────────────────────────────────┐ ║│
│ ║ │ [ ] Upper...              [ ] Lower...            │ ║│
│ ║ └───────────────────────────────────────────────────┘ ║│
│ ║                                                       ║│
│ ║ [ ] When...    [ ] Error...    [X] Scroll bar        ║│
│ ║ [ ] Valid...   [ ] Comment...  [ ] Allow tabs        ║│
│ ║ [ ] Message... [ ] Disabled    [ ] Refresh           ║│
│ ╚═══════════════════════════════════════════════════════╝│
└─────────────────────────────────────────────────────────┘
```

Scroll Bar
Check Box

Figure 10: Screen Field Dialog

```
┌──────────────────────────WINE.SCX─────────────────────────┐
│ R: 12 C: 58 │      Move │                                  │
│ ═══════════Wine Collecting Is My Hobby═══════════          │
│ Winery 1: winery..........    Origin 4: origin..........   │
│                                                            │
│ Type 2: type...   Class 3: class.......    Rating 8        │
│                                                            │
│    Value 10: pvalue         Date                           │
│    Cost 9: cost...                                         │
│                         Corked 6: dcork                    │
│                      Purchased 5: dpurc                    │
│                       Consumed 7: dcons                    │
│                                                            │
│ Comments 11: comments.................................. ▲  │
│         ........................................... ║  │
│         ........................................... ▼  │
└────────────────────────────────────────────────────────────┘
```

Sized
Memo Field

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. 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**.

```
┌─────────────────────────────────────────────┐
│ ┌───────────────────────────────────────┐   │
│ │ Save Screen As:                        │   │
│ │ ┌─────────────────┐                    │   │
│ │ │►[..]            │      Drive ┌──────┐│   │
│ │ │ CONTROL3.SCX    │            │  C   ││   │
│ │ │                 │            └──────┘│   │
│ │ │                 │   Directory┌──────┐│   │
│ │ │                 │            │TUTORIAL││  │
│ │ │                 │            └──────┘│   │
│ │ │                 │         «  Save  » │   │
│ │ └─────────────────┘                    │   │
│ │    [ ] All Files           < Cancel  > │   │
│ │ ┌─────────────────────────────────────┐│   │
│ │ │CELLAR                               ││   │
│ │ └─────────────────────────────────────┘│   │
│ └───────────────────────────────────────┘   │
└─────────────────────────────────────────────┘
```

Figure 12: Save As Dialog

```
┌──────────────────────────────────────────────┐
│ ┌─ Screens ──────────┐  ┌─ Code Options ────┐ │
│ │ ┌─────────────┐    │  │ [X] Open Files    │ │
│ │ ↕│CELLAR       │ < Edit >│ [X] Close Files   │ │
│ │ ↕│             │    │  │ [X] Define Windows│ │
│ │ ↕│             │ < Add  >│ [X] Release Windows│ │
│ │ ↕│             │    │  │ [X] READ CYCLE    │ │
│ │ ↕│             │ < Remove >│ [ ] Multiple READs│ │
│ │ ↕│             │    │  │ [ ] READ NOLOCK   │ │
│ │ ↕│             │ < Arrange >│ [ ] Modal      │ │
│ │ └─────────────┘    │  │ [ ] Assoc. Windows...│ │
│ └────────────────────┘  └───────────────────┘ │
│ ┌─ Screen Code ──────────────────────────────┐│
│ │ < Output File... >     < Comment Options...>││
│ │ ┌────────────────────────────────────────┐ ││
│ │ │C:\FOXPRO25\TUTORIAL\CELLAR.SPR         │ ││
│ │ └────────────────────────────────────────┘ ││
│ │    « Generate »          < Cancel >        ││
│ └────────────────────────────────────────────┘│
└──────────────────────────────────────────────┘
```

Generate
Push   ──────→ « Generate »
Button
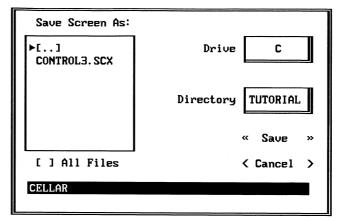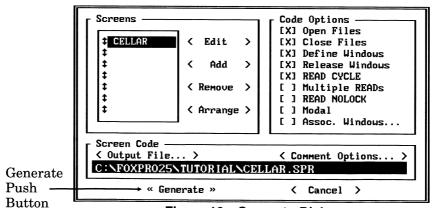
Figure 13: Generate Dialog

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

Doing CELLAR.SPR

1. Close CELLAR.SCX.

2. Choose **Do...** from the **Program** menu. 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.

```
┌─────────────────────────────────────────────────────┐
│  Do Program File:                                     │
│                                                       │
│  ┌──────────────────┐                    ┌──────────┐ │
│  │ [..]            ▲│        Drive        │    C     │ │
│  │ CELLAR.SPR      ◆│                     └──────────┘ │
│  │ SESSION2.QPR     │                                  │
│  │ SESSION3.QPR     │                                  │
│  │ SESSION4.QPR     │      Directory      ┌──────────┐ │
│  │ SESSION5.QPR     │                     │ TUTORIAL │ │
│  │ STEP1.QPR        │                     └──────────┘ │
│  │ STEP2.QPR        │              «    Do    »        │
│  │ STEP3.QPR       ▼│                                  │
│  └──────────────────┘              <  Cancel  >        │
│                                                        │
│  [ ] All Files                                         │
└─────────────────────────────────────────────────────┘
```

Figure 14: Do Dialog

```
┌════════════════Wine Collecting Is My Hobby════════════┐
│ Winery  Mogen David                Origin  ?           │
│                                                        │
│ Type  Generic      Class  Concord Grape      Rating  0 │
│                                                        │
│    Value      3.59           Date                      │
│    Cost       3.59      ─────────────────              │
│                            Corked    /  /              │
│                         Purchased  02/12/91            │
│                          Consumed    /  /              │
│                                                        │
│ Comments   This was a gift from Bert.                  │
│                                                        │
└════════════════════════════════════════════════════════┘
```

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 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.

Creating a Screen
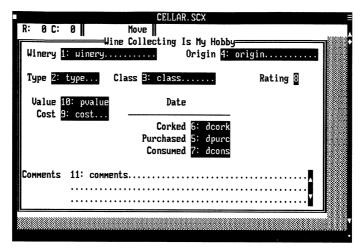
Figure 16: CELLAR.SCX

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. 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 text box next to **Say....**

   Instead of typing in an expression, you can choose the **Say...** push button. This will bring up the Expression Builder dialog. A detailed discussion of the Expression Builder can be found in the File Menu chapter of the FoxPro *User's Guide*.

7. Choose the **Refresh** check box (see below).

8. When the dialog appears as in Figure 18, choose **OK**.

Choosing the **Refresh** check box will make the calculation field update itself to show the correct answer. In our example, **Refresh** is activated when the database is opened or when you move into that record.
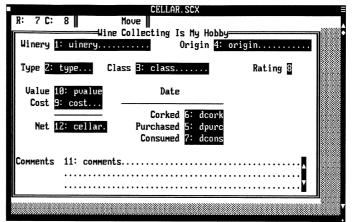
Figure 17: CELLAR.SCX with Calculated Field
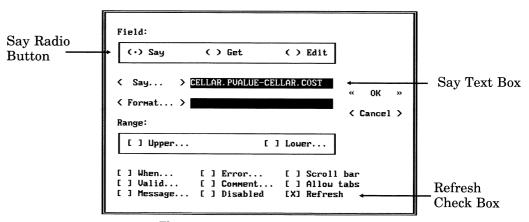
Figure 18: Screen Field Dialog

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.

4. Choose the **Say** radio button.

5. Type `(DATE()-cellar.dcork)/365` in the **Say** text box to determine the age of the wine.

6. Choose the **Refresh** check box.

7. When the Screen Field dialog appears as shown in Figure 20, choose **OK**.
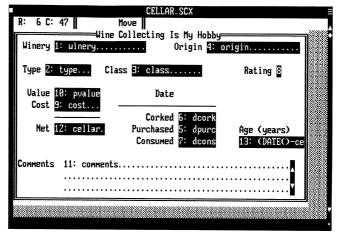
**Figure 19: CELLAR.SCX with Another
Calculated Field**
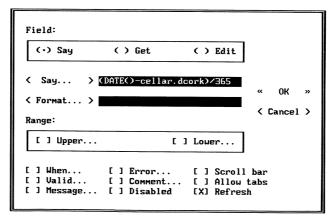
Figure 20: Screen Field Dialog

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:

   - With the keyboard, position the cursor on the RATING field, press the Spacebar to select it, then press Delete.

   - With the mouse, point to the RATING field and click then press Delete.

2. Position the cursor directly beneath the "Rating" field title.

3. Choose **Popup...** from the **Screen** menu. 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.

```
┌─────────────────────────────────────────────────────────────┐
│ ┌───────────────────────────────────────────────────────┐   │
│ │                                                         │   │
│ │ Choose a Field or Variable:<varN>                       │   │
│ │ cellar.rating                                           │   │
│ │                                                         │   │
│ │ Database Fields:              Memory Variables:         │   │
│ │                    Database:                            │   │
│ │   WINERY    │ C ▲              ►_ALIGNMENT │ C ▲         │   │
│ │   TYPE      │ C ◊    ┌───────┐  _BOX       │ L ◊         │   │
│ │   CLASS     │ C      │CELLAR │  _INDENT    │ N           │   │
│ │   ORIGIN    │ C      └───────┘  _LMARGIN   │ N           │   │
│ │   DPURCH    │ D                 _PADVANCE  │ C           │   │
│ │   DCORK     │ D    «   OK   »   _PAGENO    │ N           │   │
│ │   DCONSUM   │ D                 _PBPAGE    │ N           │   │
│ │ ►RATING     │ N ▼  < Cancel >   _PCOLNO    │ N ▼         │   │
│ │                                                         │   │
│ └───────────────────────────────────────────────────────┘   │
└─────────────────────────────────────────────────────────────┘
```
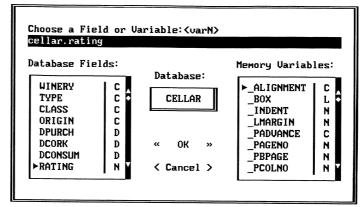
Figure 21: Choose Field/Variable Dialog

```
┌──────────────────────────────────────────────────────┐
│  (•) List Popup          ( ) Array Popup               │
│                                                        │
│  ↕ Fatal               Variable:                       │
│  ↕ Septic                                              │
│  ↕ Nauseating          < Choose... > cellar.rating     │
│  ↕ So-so                                               │
│  ↕ Sublime             Options:                        │
│  ↕ Intense                                             │
│  ↕ Awesome             [ ] When...    [ ] Comment...   │
│                        [ ] Valid...   [ ] Disabled     │
│                        [ ] Message... [ ] 1st Element..│
│                                       [ ] # Elements...│
│                                                        │
│  Initial:  ┌────────┐       «  OK  »   < Cancel >      │
│            │  So-so │                                  │
│            └────────┘                                  │
└──────────────────────────────────────────────────────┘
```

Choose...
Push Button

Variable
Text Box

Initial
Popup
Control

Figure 22: Popup Dialog

```
┌──────────────────────────────────────────────────┐
│ ■                    CELLAR.SCX                  ≡ │
│ R:  2 C: 50 ║         Move ║                        │
│ ═════════════Wine Collecting Is My Hobby══════════ │
│  Winery 1: winery..........    Origin 4: origin....│
│                                                    │
│  Type 2: type...   Class 3: class......   Rating   │
│                                                    │
│   Value 9: pvalue.        Date        ┌──────────┐ │
│   Cost 8: cost...                     │  So-so   │ │
│                                       └──────────┘ │
│     Net 11: cellar.    Corked  6: dcork            │
│                     Purchased  5: dpurc  Age (years)│
│                      Consumed  7: dcons  12: (DATE()-ce│
│                                                    │
│ Comments  10: comments.........................▲  │
│              ..................................   │
│              ..................................▼  │
└──────────────────────────────────────────────────┘
```

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. 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. 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**.

```
┌──────────────────────────────────────────────────┐
│ Select screen file name:                           │
│  ┌───────────────────────┐                         │
│  │ [..]                   │    Drive    ┌─────────┐ │
│  │ CELLAR.SCX             │             │    C    │ │
│  │ CONTROL3.SCX           │             └─────────┘ │
│  │                        │                         │
│  │                        │  Directory  ┌─────────┐ │
│  │                        │             │ TUTORIAL│ │
│  │                        │             └─────────┘ │
│  │                        │                         │
│  │                        │       «    Add    »     │
│  │                        │                         │
│  └───────────────────────┘       < Cancel  >        │
│  [ ] All Files                                      │
└──────────────────────────────────────────────────┘
```
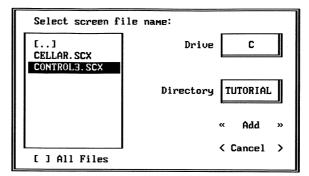
Figure 24: Open File Dialog

```
┌─────────────────────────────────────────────────────────────┐
│ ┌Screens────────────────────┐ ┌Code Options────────────────┐ │
│ │                            │ │ [X] Open Files              │ │
│ │ ┌────────────┐             │ │ [X] Close Files             │ │
│ │ │‡ CELLAR     │ < Edit   > │ │ [X] Define Windows          │ │
│ │ │‡ CONTROL3   │            │ │ [X] Release Windows         │ │
│ │ │‡            │ < Add    > │ │ [X] READ CYCLE              │ │
│ │ │‡            │            │ │ [ ] Multiple READs          │ │
│ │ │‡            │ < Remove > │ │ [ ] READ NOLOCK             │ │
│ │ │‡            │            │ │ [ ] Modal                   │ │
│ │ │‡            │ < Arrange >│ │ [ ] Assoc. Windows...       │ │
│ │ └────────────┘            │  └─────────────────────────────┘ │
│ ┌Screen Code───────────────────────────────────────────────┐ │
│ │ < Output File... >              < Comment Options... >    │ │
│ │ C:\FOXPRO25\TUTORIAL\CELLAR.SPR                           │ │
│ └───────────────────────────────────────────────────────────┘ │
│          « Generate »                  < Cancel >              │
└─────────────────────────────────────────────────────────────┘
```
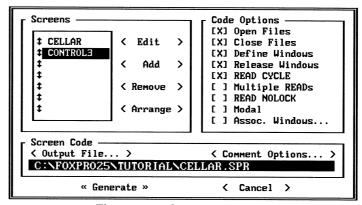
Figure 25: Generate Dialog

```
┌Controls┐
│        │
│        │
│        │        ┌Wine Collecting Is My Hobby┐
│        │        │                            │
│        │        │                            │
│        │        │                            │
│        │        │                            │
│        │        │                            │
│        │        │                            │
└────────┘        └────────────────────────────┘
```
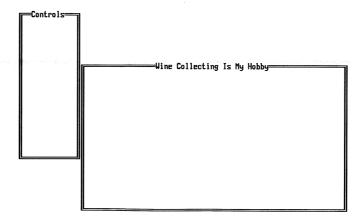
Figure 26: Screen Arrangement

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.

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.

4. To see the effect of this information, use your controls to move to another record then come back to this record. Now you can see the calculated results. Choose **Quit** from the Controls screen.

```
┌=Controls=┐
│          │
│ < Top  > │
│          │
│ <Prior > │
│          │      ┌======================Wine Collecting Is My Hobby======┐
│ < Next > │      │ Winery ▐Mogen David      ▌        Origin ▐?          ▌ │
│          │      │                                                        │
│ <Bottom> │      │ Type ▐Generic  ▌   Class ▐Concord Grape▌      Rating    │
│          │      │                                             ┌────────┐  │
│ <Append> │      │    Value        3.59          Date          │        │  │
│          │      │    Cost         3.59     _____        └────────┘  │
│ < Quit > │      │                           Corked   ▐  /  /▌             │
│          │      │     Net         0.00     Purchased ▐02/12/91▌  Age (years)│
└==========┘      │                          Consumed  ▐  /  /▌         0.0│
                  │0                                                        │
                  │Comments  This was a gift from Bert.                     │
                  │                                                         │
                  └=========================================================┘
```

Figure 27: Screen Set

Controls Screen
Moved Down
    │
    ▼

```
┌=Controls=┐
│          │
│ < Top  > │
│          │      ┌======================Wine Collecting Is My Hobby======┐
│ <Prior > │      │ Winery    ▐Aunt Wilma's     ▌    Origin ▐grapes?    ▌ │
│          │      │                                                        │
│ < Next > │      │ Type ▐Generic ▌    Class ▐Grape        ▌      Rating    │
│          │      │                                             ┌────────┐  │
│ <Bottom> │      │    Value      ▐-5.00▌         Date          │ Fatal  │  │
│          │      │    Cost        0.00      _____        └────────┘  │
│ <Append> │      │                           Corked   ▐04/09/88▌          │
│          │      │     Net        -5.00     Purchased ▐05/21/89▌  Age (years)│
│ < Quit > │      │                          Consumed  ▐  /  /▌         3.7│
└==========┘      │4                                                        │
                  │Comments   This is one of Wilma's best!                  │
                  │                                                         │
                  └=========================================================┘
```

Figure 28: Appended Record

Applications (vertical, right margin)

Generating an Application with FoxApp

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

Generating an Application with FoxApp

In Chapter 10, you created and modified your own database. In the last chapter you designed an attractive custom screen for your database. In this chapter you are going to "pull it all together" using FoxApp, the FoxPro Application Generator.

FoxApp takes a database and a screen and creates an *application*, or program, that allows you to manage your database more efficiently. By using FoxApp to build an application from your database and screen, you get a host of added functionality without having to write a single word of code.

For example, when you execute the CELLAR.SPR program you created in the last session, your custom screen and a control screen appears. While you can append new records and navigate through the records via the control screen, your program lacks functionality such as searching for, indexing, and deleting records, querying, generating reports, and so on.

When you use FoxApp to generate your application, it automatically adds a menu system that provides these capabilities and more.

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 desire.

Starting FoxApp

1. Choose **Do...** from the **Program** menu. The Do dialog appears. (Figure 1)

2. Make sure that **C** shows on the **Drive** popup control and **FOXPRO25** shows on the **Directory** popup control. Select FOXAPP.APP and choose **Do**. The FoxApp dialog appears. (Figure 2)

```
┌─────────────────────────────────────────────────────────┐
│  Do Program File:                                         │
│  ┌──────────────────┐                                     │
│  │ [..]          ▲  │      Drive    ┌──────────────┐      │
│  │ [GOODIES]     ◆  │               │      C       │      │
│  │ [TUTORIAL]       │               └──────────────┘      │
│  │ ADDUSER.APP      │                                      │
│  │ DEMO.APP         │      Directory ┌─────────────┐      │
│  │ FOX.EXE          │               │  FOXPRO25    │      │
│  │ FOXAPP.APP       │               └──────────────┘      │
│  │ FOXL.EXE         │               «    Do    »          │
│  │ FOXPROL.EXE   ▼  │                                      │
│  └──────────────────┘               < Cancel  >           │
│  [ ] All Files                                            │
└─────────────────────────────────────────────────────────┘
```

Figure 1: Do Dialog

```
┌═══════════ FoxPro Application Generator ═══════════┐
│                                                     │
│  Step 1: Create or modify a database                │
│  ┌───────────────────────────────────────────────┐ │
│  │ Database name:            <Related... >         │ │
│  │                                                 │ │
│  │ < Create >   < Modify >  < File List >          │ │
│  └───────────────────────────────────────────────┘ │
│                                                     │
│  Step 2 : Design a screen                           │
│  ┌───────────────────────────────────────────────┐ │
│  │ Screen name:                                    │ │
│  │                                                 │ │
│  │ < Create >   < Modify >  < File List >          │ │
│  └───────────────────────────────────────────────┘ │
│                    «  Generate  »                   │
│                    <  Advanced  >                   │
│                    <   Cancel   >                   │
└─────────────────────────────────────────────────────┘
```
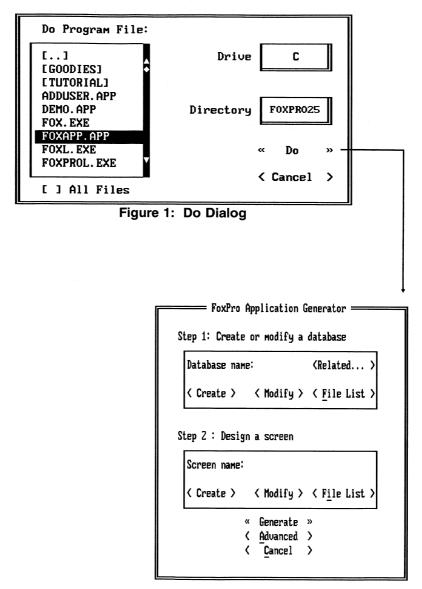
Figure 2: FoxApp Dialog

The first step when using FoxApp is to select a database. If the database does not 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. Make sure **TUTORIAL** shows on the **Directory** popup control. Select CELLAR.DBF then choose **Open**. The FoxApp dialog appears as in Figure 4.

When you select your database, FoxApp finds the screen with the same name and automatically places it in the **Screen Name** text box in the FoxApp dialog.

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

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

```
┌────────────────────────────────────────────────────────┐
│ Database name                                            │
│ ┌──────────────────────┐    Drive  ┌────────────────┐   │
│ │ [..]                 │           │       C        │   │
│ │ CELLAR.DBF           │           └────────────────┘   │
│ │ CUSTOMER.DBF         │                                 │
│ │ DETAIL.DBF           │    Directory ┌──────────────┐   │
│ │ INVOICES.DBF         │              │ TUTORIAL     │   │
│ │ OFFICES.DBF          │              └──────────────┘   │
│ │ PARTS.DBF            │                                 │
│ │ SALESMAN.DBF         │           «   Open    »         │
│ │                      │                                 │
│ └──────────────────────┘           ‹ Cancel  ›          │
│ [ ] All Files                                            │
└────────────────────────────────────────────────────────┘
```
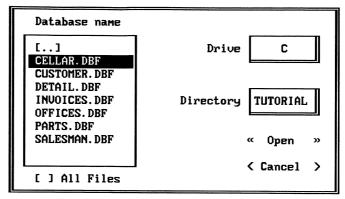
Figure 3: Open File Dialog

```
┌══════════ FoxPro Application Generator ══════════┐
│                                                    │
│  Step 1: Create or modify a database               │
│                                                    │
│  ┌──────────────────────────────────────────┐     │
│  │ Database name:          ‹Related... ›      │     │
│  │ C:\FOXPRO25\TUTORIAL\CELLAR.DBF            │     │
│  │ ‹ Create ›   ‹ Modify ›  ‹ File List ›     │     │
│  └──────────────────────────────────────────┘     │
│                                                    │
│  Step 2 : Design a screen                          │
│                                                    │
│  ┌──────────────────────────────────────────┐     │
│  │ Screen name:                               │     │
│  │ C:\FOXPRO25\TUTORIAL\CELLAR.SCX            │     │
│  │ ‹ Create ›    ‹ Modify ›  ‹ File List ›    │     │
│  └──────────────────────────────────────────┘     │
│                                                    │
│                «  Generate  »                      │
│                ‹  Advanced  ›                      │
│                ‹   Cancel   ›                      │
│                                                    │
└────────────────────────────────────────────────────┘
```
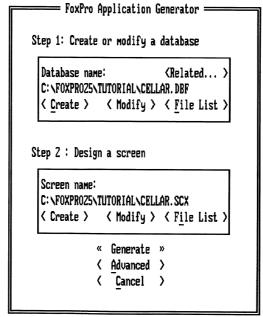
**Figure 4: FoxApp Dialog with
CELLAR.DBF and CELLAR.SCX**

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

When FoxApp finishes generating your application, a message appears on your screen telling you to press any key to start your 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 begins generating your application and displays a thermometer indicating its progress. (Figure 6)

Name your application:

```
▶[..]
```

Drive   C

Directory   TUTORIAL

«   Save   »

[ ] All Files   < Cancel >

CELLAR.APP

Figure 5: Save As Dialog

System File Edit Database Record Program Window

Generating application Cellar

Generating Screen Code...
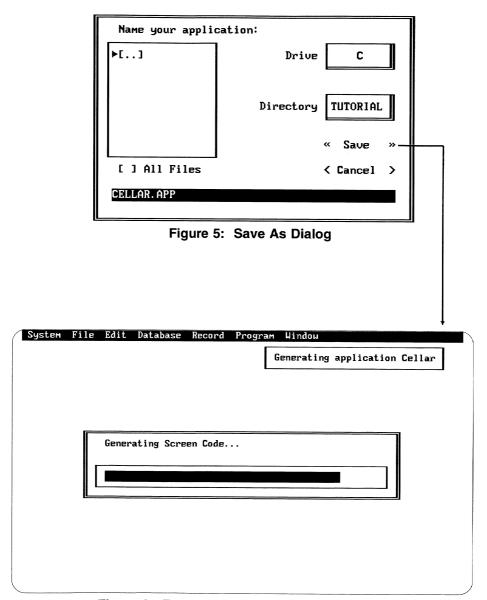
Figure 6: FoxApp's Message and Thermometer

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

Starting Your Application

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

The input screen and control screen help you to navigate easily through your database file.

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

```
System  Edit  Application  Utilities
╔══════════════════════Wine Collecting Is My Hobby══════════════════════╗
║  Winery Aunt Wilma's             Origin    grapes?                     ║
║                                                                        ║
║  Type Generic      Class Grape                    Rating               ║
║                                                              ┌─────────┐║
║    Value      -5.00          Date                            │  Fatal  │║
║    Cost        0.00      ─────────────                       └─────────┘║
║              ─────────       Corked 04/09/88                           ║
║    Net        -5.00      Purchased 05/21/89    Age (years)             ║
║                          Consumed   /   /                    3.81      ║
║                                                                        ║
║ Comments  This is one of Aunt Wilma's best!                            ║
║                                                                        ║
╚════════════════════════════════════════════════════════════════════════╝

  < Top > < Prior > < Next > < Bottom > < Search > < Quit >
```
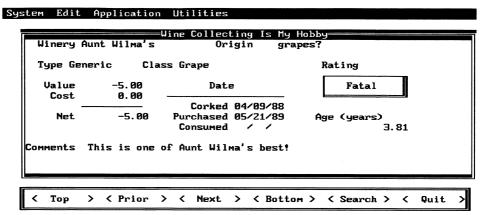
Figure 7: Generated Application

The **Application** and **Utilities** menus 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 menus. 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 these options at your fingertips!

You're probably anxious to try your application. Go ahead and use it for a while. When you're done, follow the steps below.

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.

Exiting FoxApp

1. Choose the **Quit** push button on the control screen. An Application to Run dialog appears.

2. Choose **Cancel**.

Information about other features of FoxApp is available in the online help.

```
┌─────────────────────────────────────────────────────────────┐
│  ▐Application▌              ▐Utilities▌                       │
│  ┌──────────────┐    ┌──────────────────┐                    │
│  │ Top      F2  │    │ Construct index  │                    │
│  │ Bottom   F3  │    │ Pack             │                    │
│  │ Next     F4  │    │▐Environment     ►▌  ┌──────────────────┐ │
│  │ Prior    F5  │    └──────────────────┘  │ Status Bar       │ │
│  │              │                          │ Clock            │ │
│  │ Add record   │                          │ Extended video   │ │
│  │ Copy record  │                          │◆Sticky           │ │
│  │ Delete record ^D│                       └──────────────────┘ │
│  │              │                                              │
│  │ Browse    ^B │                                              │
│  │ Search... ^S │                                              │
│  │ Filter... ^F │                                              │
│  │ Order...  ^O │                                              │
│  │              │                                              │
│  │ Query...  ^Q │                                              │
│  │ Report... ^R │                                              │
│  └──────────────┘                                             │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```
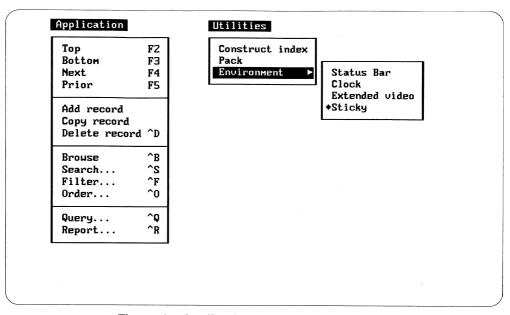
Figure 8: Application and Utilities Menu

Let's look at one of these files.

If you're new to FoxPro and its programming language, you'll probably find that you don't understand all the statements in the program file. That's normal. With time and practice, you'll become familiar with the language.

Opening an Application File

1. Choose **Open...** from the **File** menu. Make sure **TUTORIAL** is showing on the **Directory** popup control and **Program** is showing on the **Type** popup control. Select SCAFFOLD.PRG then choose **Open**. A program editing window, as shown in Figure 9, appears with FoxPro code in it.

2. Look at some of the commands.

3. Close the program editing window.

```
   SELECT 0
   USE C:\FOXPR025\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: SCAFFOLD.PRG

A good way to start learning about FoxPro's programming language is to observe and try out commands in the Command window.

The Command window keeps track of all the commands you use from the time you start FoxPro. When you choose a menu option, the equivalent command is logged in the Command window. You can scroll through these commands to look at them, or even re-execute them. Figure 10 shows the Command window as it may appear during a FoxPro session.

In addition to viewing commands in the Command window, you can also type commands in it. Everything that you do when you use FoxPro's interface can be accomplished by entering commands into the Command window. For example, typing `Quit` in the Command window has the same result as choosing **Quit** from the **File** menu.

You can learn more about FoxPro commands by reading the FoxPro *Language Reference*. The commands are organized alphabetically and explained in detail. Each command is also explained in FoxPro's online help system.

```
┌──────────────────── Command ──────────────────≡─┐
│ SET DEFAULT TO C:\FOXPRO25\FOXAPP              ▲ │
│ DO C:\FOXPRO25\FOXAPP\FOXAPP.APP                 │
│ USE C:\FOXPRO25\TUTORIAL\CUSTOMER.DBF            │
│ BROWSE LAST                                      │
│ CHANGE                                           │
│ GO BOTTOM                                        │
│ RECALL ALL                                       │
│                                                ◆ │
│                                                ▼ │
│ ◄◆                                           ►•  │
└──────────────────────────────────────────────────┘
```
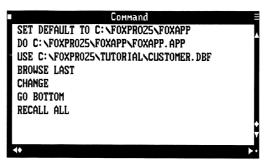
Figure 10: Command Window

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.
>
> 2. Type `CLOSE ALL` in the Command window then press Enter.
>
> 3. Type `CLEAR` in the Command window then press Enter.
>
> 4. Type `USE C:\FOXPRO25\TUTORIAL\CUSTOMER.DBF` in the Command window then press Enter.
>
> 5. Type `BROWSE` in the Command window then press Enter.

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.

> **Taking a Look at the Command Window**
>
> Close the Browse window. The Command window appears as shown in Figure 11.

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

```
  ┌──────────────────────── Command ─────────────────────≡─┐
  │CLOSE ALL                                                │
  │CLEAR                                                    │
  │USE C:\FOXPRO25\TUTORIAL\CUSTOMER.DBF                    │
  │BROWSE                                                   │
  │◄◆                                                    ►• │
  └─────────────────────────────────────────────────────────┘
```
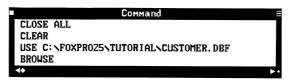
**Figure 11: Command Window with
Commands You Typed**

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?

Now What?

Congratulations! You've just been introduced to one of the most powerful relational database management systems available. 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 use 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 FoxPro *User's Guide* teaches you more about FoxPro's interface, including FoxPro's menus, Report Writer, Label Designer, Screen Builder, Menu Builder, RQBE and Project Manager.

- The FoxPro *Language Reference* 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 FoxPro *Developer's Guide* covers topics of particular interest to those who develop applications. Topics include tips for using projects, screens, menus, SQL SELECT, arrays, low-level file I/O, text merge, FoxDoc and more.

The following additional sources are available:

- Classes on FoxPro in your area offered by trainers and local universities.

- *Microsoft FoxPro Resource Directory*. This book can assist you in finding consultants and third party FoxPro applications.

- FOXFORUM on CompuServe®. Refer to the Product Support chapter in the FoxPro *Installation and Configuration* manual for more information.

- The Microsoft FoxPro Developer Conference. Contact Microsoft for more information.

- Third party FoxPro books.

- FoxPro user groups.

- 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!

MS-DOS and FoxPro

This appendix discusses how to use MS-DOS® to create and organize FoxPro files on your computer. It is not intended to be an MS-DOS tutorial — if you are not familiar with MS-DOS, consult your MS-DOS manual or an MS-DOS book.

- What is MS-DOS? . . . . page 2
- How Does MS-DOS Organize Files? page 4

Appendix A

What is MS-DOS?

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

Your computer uses MS-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.

MS-DOS File Names

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

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

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

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

MS-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 *Installation and Configuration* manual.

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 MS-DOS commands that are executed when you turn on your computer. An MS-DOS PATH command can be included in your AUTOEXEC.BAT file to tell MS-DOS and FoxPro where to look for files. An MS-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 MS-DOS Organize Files?

MS-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. Disks 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 usually called *hard drives.*

Specifying the Current Disk Drive

During the installation of FoxPro you may have to specify a *current disk drive.* MS-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 MS-DOS prompt.

To make a disk drive the current drive, type the drive letter followed by a colon (:) at the MS-DOS prompt, then press Enter. For example, to make the A drive the current drive, at the MS-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 FOXPRO25.

A directory can contain files and additional directories called *subdirectories.* FoxPro 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, CD. When you move to a directory, it becomes the current working directory. MS-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 MS-DOS command

```
CD\
```

To move to another directory, place the directory name immediately after the CD\ command. For example, to move to the FOXPRO25 directory, use the command

```
CD\FOXPRO25
```

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 FOXPRO25 directory, use the command

```
CD\FOXPRO25\TUTORIAL
```

Creating New Directories

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

Use CD to move to the directory where you create the new directory or subdirectory. Issue the command MD followed by the name of the new directory or subdirectory. The following MS-DOS commands make the FOXPRO25 directory the current directory, and then create a subdirectory named EXAMPLES:

```
CD\FOXPRO25
MD EXAMPLES
```

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

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 frontmost 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, 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 can 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.

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.

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 in the Preferences dialog 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 *Language Reference*.

batch file – A batch file contains commands that control the operation of the computer. These commands take the place of input from the keyboard. Batch files have the extension ".BAT".

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.

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:* clipboard, type-ahead buffer.

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 the result of an expression or calculation. A formula can consist of database fields, constants, and/or functions connected by operators.

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.

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.

character – Any symbol that has a widely understood meaning. 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 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 attributes, 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.

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

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.

close – To make a window or file disappear from the screen so that it can't be accessed until reopened.

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

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

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 defined 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.

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. The compact single entry index has an ".IDX" file extension.

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 – One or more commands used in a program to alter the action of a compiler.

compound index file – An index file containing multiple index entries, called tags. This file has a ".CDX" file extension.

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. (3) Software settings used to customize an application.

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 – (1) An expression that defines the contents of a group in a report. (2) A term used to stop the execution of a program or routine.

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.

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 character 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 selected text or objects and place it on the clipboard, leaving the original selection intact.

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

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 delete selected text or objects but place a copy of the selection on the clipboard.

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 into records and fields so that it can be readily manipulated and sorted by a computer user.

database management system (DBMS) – 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.

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.

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

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

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 postioned.

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.

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.

detail band – An area of the report that typically contains one or more lines for each record that is printed from the database.

dialog – A box that contains a message requesting more information to complete a command or an expression.

dimension – The maximum size of an array.

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 dimmed and cannot be chosen.

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.

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.

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 cells or elements that make-up an array.

embedded – Contained within. For example, the string "WEST COAST" 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 control character indicating that the preceding text constitutes a complete line.

error code – A number or other symbol representing a type of error.

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 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.

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 using operators and functions 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. One or more fields make a record.

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 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 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.

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 – (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.

form feed – An ASCII control character (decimal 12) that causes a printer or other paper handling device to advance to the top of the next page.

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.

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.

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.

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.

hot key – A highlighted letter that you can type to immediately choose the desired control in a dialog, display a menu when the menu bar is activated, or choose a menu option from a displayed menu.

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 – To set to an initial state or value in preparation for some computation.

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.

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, 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. Key words 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 control 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, screen or printed page.

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.

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.

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.

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 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, any of the graphic (box-drawing), foreign alphabet and special symbol characters plus binary image data. 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.

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, 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 – 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, menus and menu options.

microcomputer – A computer whose processor is a microprocessor.

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.

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.

name expression – A name expression substitutes the value of a character type memory variable or array element as the name. Name expressions provide flexibility in FoxPro commands and functions.

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-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. Null is synomous with "empty".

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.

online – 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.

online 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.

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. (2) An argument whose provision is optional.

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 thumb. 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 thumb. Clicking in this area causes a window to scroll through a full page of text at a time.

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.

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.

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 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.

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.

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.

Rushmore technology – A data access technique that permits sets of records to be accessed very efficiently, at speeds comparable to single-record indexed access.

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.

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.

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.

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 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.

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.

shortcut – You can use a Control key combination as a shortcut to choose a menu option without displaying the menu.

size control – Control found on windows that allows you to change the window size a little at a time.

source – The original, as opposed to the duplicate. When you are making a copy of a file, the source is the location you are copying from. *See also:* destination.

SQL (Structured Query Language) – FoxPro supports Structured Query Language (SQL) commands. FoxPro's SQL commands make use of Rushmore technology to optimize performance, and a single SQL command may be used to replace multiple FoxPro commands.

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 messages – The boxes that appear in upper right corner of the screen to present information.

tab – 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.

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.

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.

type-ahead buffer – A buffer that accepts and holds characters that are typed faster than the computer can process them.

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 appication, 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.

wrap around – An option in the Find/Replace dialog that tells FoxPro to search for a specified string from your present cursor postion to your current postion, 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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