User's Guide

Microsoft® FoxPro®

Relational Database Management System for MS-DOS®

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1 Interface Basics

The FoxPro® interface consists of menus, windows, dialogs and other features that make it easy for you to communicate with FoxPro.

The interface is *non-procedural*, so you can perform operations without typing commands. It is also *event-driven* — it waits for you to tell it what to do next. You control the sequence of actions that the computer performs.

FoxPro is designed for use with a mouse or a standard keyboard. With a keyboard, you use the arrow keys and keystroke combinations to choose objects and controls in the interface. Although FoxPro does not require a mouse, we recommend it for its ease-of-use. With the click of a button, a mouse can accomplish the equivalent of a single keystroke or many keystrokes on the keyboard.

This chapter is divided so that keyboard users can refer to the Keyboard Techniques portion and mouse users can refer to the Mouse Techniques portion. Mouse users who wish to use the keyboard for certain activities may want to read the Keyboard Techniques section, also. At the end of the chapter, several general topics are discussed that relate to both mouse and keyboard users.

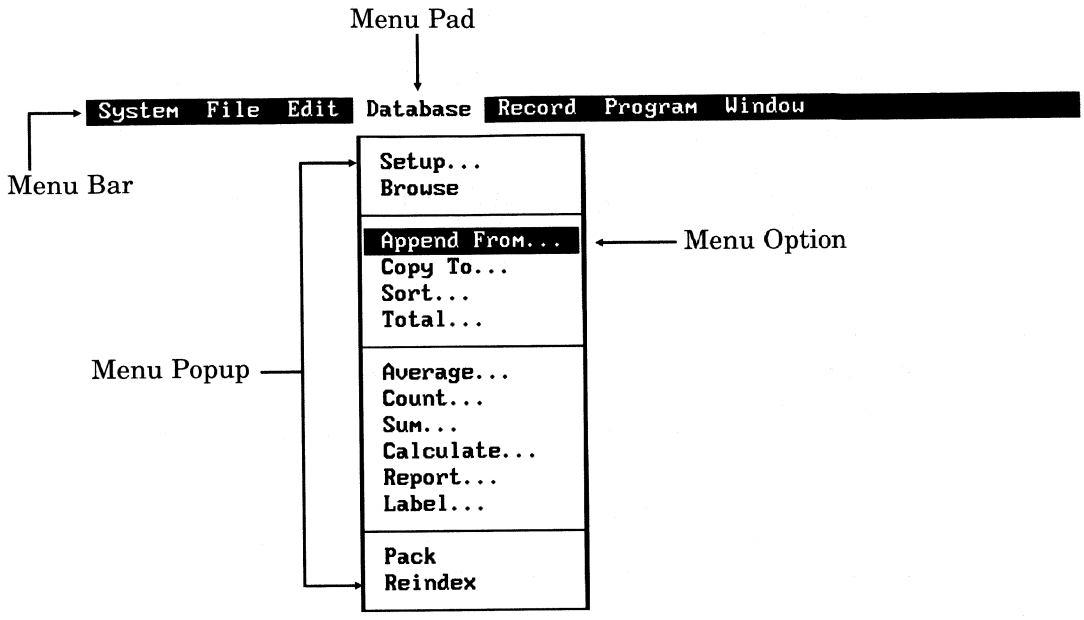
Keyboard Techniques

Every FoxPro operation can be controlled with the keyboard, as described in this section. However, keyboard users might find it handy to use the mouse for certain operations. For example, with a mouse you can control system windows by clicking and dragging. This is often faster and easier than using the keystroke equivalents.

Throughout the FoxPro documentation, certain terms appear frequently. These terms are defined in the Glossary in the FoxPro *Getting Started* manual.

Using Menus with the Keyboard

The FoxPro menu system consists of the following parts: menu bar, menu pads, menu popups and menu options. The menu system allows you to communicate with FoxPro without programming. Each part of the menu system is described below.



Menu System

Menu Bar

A menu bar is located along the top of the screen. The *menu bar* displays names for menu popups. These names on the menu bar are called *menu pads*.

The content of the menu bar changes as you access different parts of the interface. Different actions cause menu pads to be added to and removed from the menu bar.

Menu Pads

Menu pads appear on the menu bar and display the names of menu popups. You can use the keyboard to display the menu popup associated with each menu pad. Sometimes, certain menu pads appear dimmed and cannot be chosen. These menu pads are *disabled*.

To access the menu bar, press the Alt key (or press F10). The **System** menu pad appears highlighted because it is selected. Press the Right and Left Arrow keys to move from menu pad to menu pad. When you are ready to exit the menu bar, press one of the following keys: Escape, Alt or F10.



Dimmed text is deemphasized so that it has little contrast with its surroundings.

Highlighted text is emphasized so that it stands out from the surroundings. Highlighting something typically indicates that it is selected or is about to be chosen.

The appearance of dimmed and highlighted text may vary depending on the type of monitor and color settings that you use.

Menu Popups

Menu pads control menu popups. *Menu popups* are lists of related options. When you choose an option from a menu popup, you are telling FoxPro what action to take. *Choose* means to activate a *selection* (highlighted option) by pressing the Spacebar.

Sometimes, certain menu pads appear dimmed and cannot be chosen. These menu pads are disabled. You can't display the menu popup if the menu pad is disabled.

To display a menu popup, do one of the following:

- Press Alt then press the hot key in the menu pad name. The *hot key* is highlighted and is usually the first letter in the menu pad name.
- Press F10 then press the hot key in the menu pad name.

If you are already in the menu bar, you can display a popup by pressing the hot key in the menu pad name. You can also press the Left and Right Arrow keys until the menu pad is selected, then press the Spacebar to display the menu popup.

Once a menu popup is displayed, you will usually choose an available option, as described in the next section. If you wish to deactivate a menu popup without choosing an option, press Escape, Alt or F10.

Menu Options

Menu popups contain *options*. The options on each menu popup are logically related to the menu pad name. On a single menu popup, options may be further grouped to indicate that they produce similar outcomes. These groups are separated by divider lines.

Certain menu options are followed by an ellipsis (...). When you choose this type of option, a dialog appears to request additional information.

Some menu options have a Control key shortcut listed next to them on the popup. You can use a Control key combination to choose the menu option without displaying the menu popup.

Sometimes, a menu option appears dimmed and cannot be chosen. This menu option is disabled.

Before you choose a menu option, use one of the methods discussed in the previous section to display the menu popup. Once the popup appears, choose an option in one of the following ways:

- Press the hot key for the option.
- Use the Up and Down Arrow keys to select the desired option, then press the Spacebar.

When you choose a menu option, an action occurs. A window may open or close, a switch may be set, a dialog may appear or a command may be generated in the Command window.

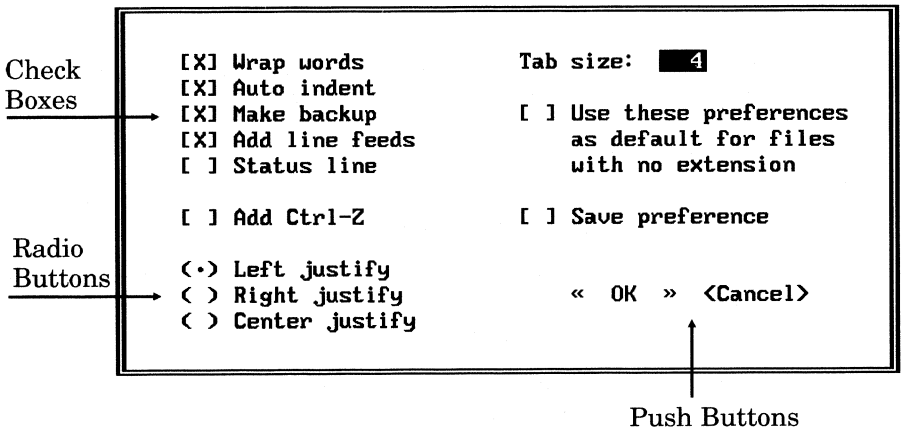
When you use the interface, you're actually generating commands in the Command window. You can also type commands directly in the Command window.

Using Dialogs with the Keyboard

When you choose a menu option that is followed by an ellipsis (...), the box that appears is called a *dialog*. Dialogs also appear at other times during your FoxPro session when more information is required to complete a command or an expression.

Dialogs contain a variety of *controls* that you use to designate, confirm or cancel actions. These controls are explained below. Methods of moving in dialogs are discussed in the next section.

When a dialog is displayed, you must exit it before you can use any other features of FoxPro. To exit a dialog, choose the appropriate push button or press Escape (to cancel the dialog). If a dialog is displayed and you try to perform an action outside of it, other than select an active menu pad, the computer beeps.



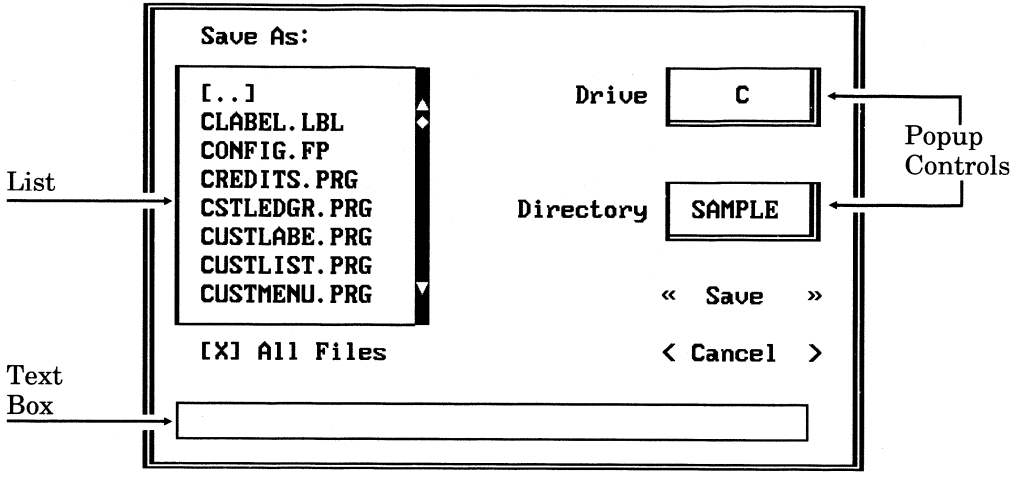
Preferences Dialog

Push Button – A *push button* is enclosed in angle brackets, as shown, and contains key words that describe the action it triggers. The action associated with a push button occurs immediately when you choose the push button unless it contains an ellipsis (...). The ellipsis indicates that another dialog will appear.

The « » push button (with double angles) is the default push button. To choose the default push button, press Ctrl+Enter from any location in the dialog, or Tab to the push button and press the Spacebar.

Check Box – A *check box* is a pair of square brackets followed by text. Settings can be turned on and off by choosing the check box with the Spacebar. If a check box has an X in it, the setting is on. More than one box in a group can be checked at the same time.

Radio Button – A *radio button* is a set of parentheses followed by text. Unlike check boxes, only one radio button in a group can be chosen at any given time. Select a radio button and press the Spacebar to choose it. When a radio button is chosen, a bullet appears in the parentheses and any previously chosen radio button in the group becomes deselected.



Save As Dialog

Popup Control – The rectangle with double lines on the right and bottom edges is a *popup control* that you can choose to display the associated popup.

To display the popup, Tab to the popup control and press the Spacebar. Now you can use PgDn and PgUp to scroll the list one full window at a time. Home and End move you to the first or last option on the popup. To choose an option, press the Up and Down Arrow keys to select the option, then press the Spacebar.

Some popups are alphabetized. To move directly to an option on an alphabetized popup, type enough letters to uniquely identify the option. The letters you type don't appear on the screen. When the appropriate option is selected, press the Spacebar to choose it.

List – This box contains a list of items like directories, files and fields that you can select. Once you Tab to the list, you can move through the list in the following ways:

- Press the Up and Down Arrow keys to move through the list item-by-item.
- Press PgUp and PgDn to display the previous or next window of list options.
- Press Home and End to select the first or last item in the list.

Some lists are alphabetized. To move directly to an item in an alphabetized list, type enough letters to uniquely identify the item. The letters you type don't appear on the screen. FoxPro highlights the first item that begins with the typed letters. After a short time, FoxPro is ready to accept the next set of letters to find a different item in the list.

Depending on the action that you want to occur, you may need to press the Spacebar or Enter to choose the item.

Text Box – This bar, as shown, indicates where you may enter text. To enter text in a text box, press the Tab key until the text box is selected. Type and edit as usual.

Movement in Dialogs with the Keyboard

In a dialog, you can always use the Tab key to move from control to control. Other methods for maneuvering in dialogs also exist.

In many dialogs, each control has a hot key for your convenience. A *hot key* is a highlighted letter that you can type to immediately choose the desired control.

When a dialog doesn't have hot keys, an additional menu pad is usually added to the menu bar. The menu popup is for use with the dialog and contains Control key shortcuts you can use to navigate in the dialog. If a menu option has a Control key shortcut, the shortcut appears next to the option on the menu popup.

The following keys allow you to maneuver in dialogs with the keyboard:

Escape – Exits the dialog without taking any action.

Ctrl+Enter – Ignores the current selection and chooses the default push button. The default push button is delimited with double angles (« »).

Tab – Selects the next dialog control.

Shift+Tab – Selects the previous dialog control.

Up/Down Arrows – When in a list or menu popup, the Up/Down Arrows move up and down through the list, item-by-item.

Home and **End** – When in a list or popup, Home and End select the first or last item in the list.

PgUp and **PgDn** – When in a list or popup, PgUp and PgDn display the previous or next window of the list.

Repositioning Dialogs on the Screen

Dialogs can be repositioned on the screen. To move a dialog using the keyboard, press Ctrl+F7. The border flashes. Use the arrow keys to move the dialog by small increments in the desired direction. Press PgUp or PgDn to move the dialog to the top or bottom of the screen. Home or End moves the dialog to the left or right edge of the screen. When you're finished, press Enter. The border stops flashing.

Controlling System Windows with the Keyboard

FoxPro windows can be manipulated in several ways. Besides opening and closing a window, you can hide, move, size, zoom and scroll most windows.

Open

Windows can be opened in a variety of ways. The Command window is automatically opened when you begin a FoxPro session. If you close the Command window, you can open it again by choosing **Command** from the **Window** menu popup. The Debug, Trace and View windows can be opened by choosing their names from the **Window** menu popup. To open the Browse window, you can choose **Browse** from the **Database** menu popup, choose the **Browse** push button in the View window, or press the Spacebar twice (or press Enter) on a work area with an open database.

To open other system windows, choose **Open...** from the **File** menu popup. The Open File dialog appears. Through this dialog, you can open program editing windows, text editing windows, Report Layout windows and Label Layout windows. For information about the Open File dialog, refer to the File Menu chapter.

When you open a window, it becomes the frontmost window on your screen. You can recognize the frontmost window because it is the only window with controls drawn on it and its title appears different than any other window titles. The names of open windows are listed at the bottom of the **Window** menu popup if the window name is not already an option on the **Window** menu.

Close

When a window is closed, you can no longer see its contents. To close the active window, press Escape or choose **Close** from the **File** menu popup. Escape doesn't close the Command window.

If you want to close all open windows, hold down the Shift key and display the **File** menu popup (Shift+Alt+F). Choose **Close All** from the **File** menu popup and all open windows are closed.

Hide

Hiding a window makes it invisible *without closing it*. To hide a window, choose **Hide** from the **Window** menu popup. The window disappears.

To hide or display all open windows, hold down the Shift key and display the **Window** menu popup (Shift+Alt+W). The **Hide** option is replaced with options that allow you to **Hide All** windows and **Show All** windows. To momentarily hide all windows in front of the current output window (which may be the screen), hold down Shift+Ctrl and press Alt.

To bring a hidden window to the front again, choose its name from the bottom of the **Window** menu popup. If the window is a memo editing window, program editing window, text editing window, Report Layout or Label Layout window, its contents will appear the same as when the window was hidden.

Move

To move a window to a new location, choose **Move** from the **Window** menu popup (or press Ctrl+F7). The window border flashes, indicating that it is ready to be moved. Now you can use the arrow keys, PgUp, PgDn, Home and End to position the window on your screen. When the window is relocated, press the Enter key and the window stops flashing.

Size

To change the size of a window, choose **Size** from the **Window** menu popup (or press Ctrl+F8). The window border flashes, indicating that it is ready to be sized. Press the arrow keys to adjust the right and bottom borders of the window. When the window is the desired size, press Enter and the window stops flashing.

Zoom ↑

To zoom a window, choose **Zoom ↑** from the **Window** menu popup (or press Ctrl+F10). The window expands to fill the screen. If a window is already full size and you choose **Zoom ↑**, the window contracts to its previous size.

Zoom ↓

To minimize a window, choose **Zoom ↓** from the **Window** menu popup (or press Ctrl+F9). The window becomes one line tall by 16 characters wide with the title of the window displayed.

To minimize and "dock" the window in the lower right corner of the screen, do *one* of the following:

- Press Shift+Ctrl+F9.
- Hold down the Shift key and choose **Zoom ↓**.

To return a minimized window to its original size, do *one* of the following:

- Choose **Zoom ↓** from the **Window** menu popup.
- Press Ctrl+F9.

Cycling Among Open Windows

Cycle refers to the process of rearranging open windows to bring successive ones to the front. To cycle, choose **Cycle** from the **Window** menu popup (or press Ctrl+F1) until the window of your choice is the frontmost window.

Scroll

You can move through a window's contents with the keyboard by using the following keys: arrow keys, PgUp, PgDn, Home and End.

Mouse Techniques

It is particularly convenient to operate FoxPro with a mouse. To do this, you must load the mouse driver and attach a mouse to your computer. When you complete these steps and start FoxPro, a pointer appears on your screen. The pointer is a solid box that contrasts with whatever it rests upon.

When you roll the mouse, the pointer moves. You can position the pointer and click (press and release the mouse button) to anchor the cursor. The cursor marks the location where an action will occur.

Mouse users may wish to use the keyboard to take advantage of Control key shortcuts. By pressing a Control key combination, you can choose most menu options without displaying the menu popup.

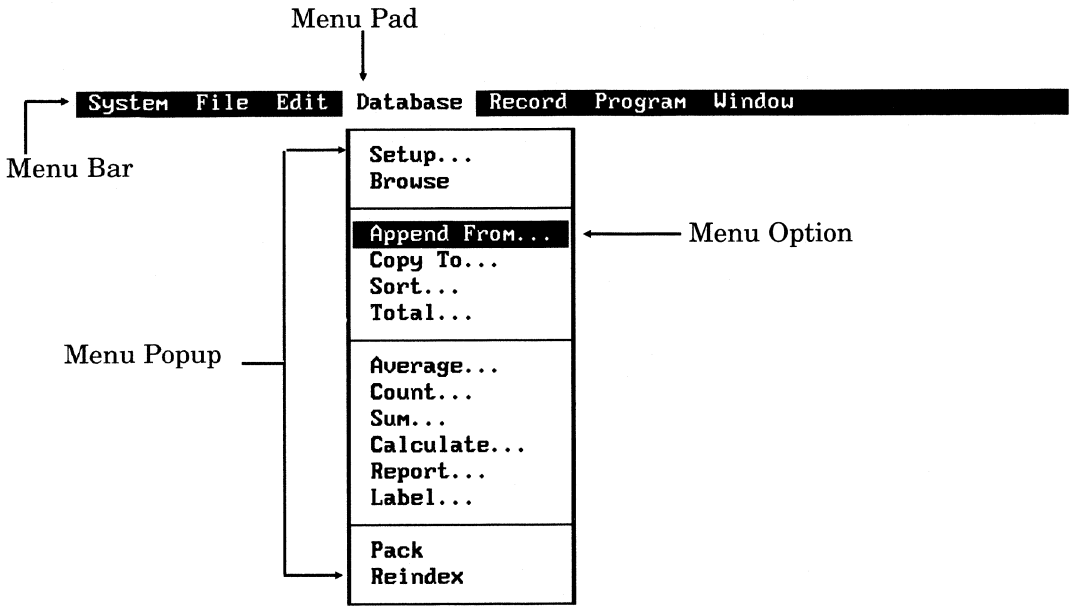
Before you begin to use a mouse with FoxPro, read the following:

- Place the mouse on a flat surface to the left or right of your keyboard, whichever is most comfortable.
- Place your palm on top of the mouse with your fingertips resting on the mouse buttons and practice rolling the mouse.
- In FoxPro, you'll notice that rolling the mouse forward and backward on the flat surface causes the pointer (a solid box) to move up and down on your screen.
- Rolling the mouse right and left moves the pointer right and left.
- Roll your mouse to the edge of the flat surface, pick it up and move it back to the center of the surface, and continue rolling. Notice that the pointer does not move while the mouse is in the air, but resumes from the place it left off once the mouse is replaced on the surface.

Note that the left button on your mouse is the only button FoxPro usually requires.

Using Menus with the Mouse

The FoxPro menu system consists of the following parts: menu bar, menu pads, menu popups and menu options. The menu system allows you to communicate with FoxPro without programming.



Menu System

Menu Bar

A menu bar is located along the top of the screen. The *menu bar* displays titles for menu popups. These titles on the menu bar are called *menu pads*.

The content of the menu bar changes as you access different parts of the interface. Different actions cause menu pads to be added to and removed from the menu bar.

Menu Pads

Menu pads appear on the menu bar and display the names of menu popups. You can use the mouse to display the menu popup associated with each menu pad. Sometimes, certain menu pads appear dimmed and cannot be chosen. These menu pads are *disabled.*

Dimmed text is deemphasized so that it has little contrast with its surroundings.



Highlighted text is emphasized so that it stands out from the surroundings. Highlighting something typically indicates that it is selected or is about to be chosen.

The appearance of dimmed and highlighted text may vary depending on the type of monitor and color settings that you use.

Menu Popups

Menu pads contain menu popups. *Menu popups* are lists of related options. When you choose an option from a menu popup, you are telling FoxPro what action to take.

Sometimes, certain menu pads appear dimmed and cannot be chosen. These menu pads are disabled. You can't display the menu popup if the menu pad is disabled.

To display a menu popup, point to a menu pad and press the mouse button. If STICKY is SET ON (the default), the menu popup will remain on the screen until you choose an option or click anywhere off of the menu popup.

If STICKY is SET OFF, you must continue to hold down the mouse button after you point to the menu pad to keep the menu popup on the screen. When you release the mouse button, the menu popup is removed from the screen. For more information about SET STICKY, refer to the FoxPro *Language Reference* manual.

Menu Options

Menu popups contain options, as shown in the illustration of the menu system. The options on each menu popup are logically related to the menu pad. On a single menu popup, options may be further grouped to indicate that they produce similar outcomes. These groups are separated by divider lines.

Certain menu options are followed by an ellipsis (...). When you choose this type of option, a dialog appears to request additional information.

Some menu options have a Control key shortcut listed next to them on the popup. You can use a Control key combination as a *shortcut* to choose a menu option without displaying the menu popup.

Sometimes, a menu option appears dimmed and cannot be chosen. This menu option is disabled.

Before you choose a menu option with STICKY SET ON (the default), point to the menu pad and click. The menu popup appears. Click on the desired option to choose it. The menu popup disappears.

Before you choose a menu option with STICKY SET OFF, point to the menu pad and hold down the mouse button. The menu popup appears. While still holding down the mouse button, drag until the appropriate option is selected. Now you can release the mouse button to choose the option. The menu popup disappears.

When you choose a menu option, an action occurs. A window may open or close, a switch may be set, a dialog may appear or a command may be generated in the Command window.

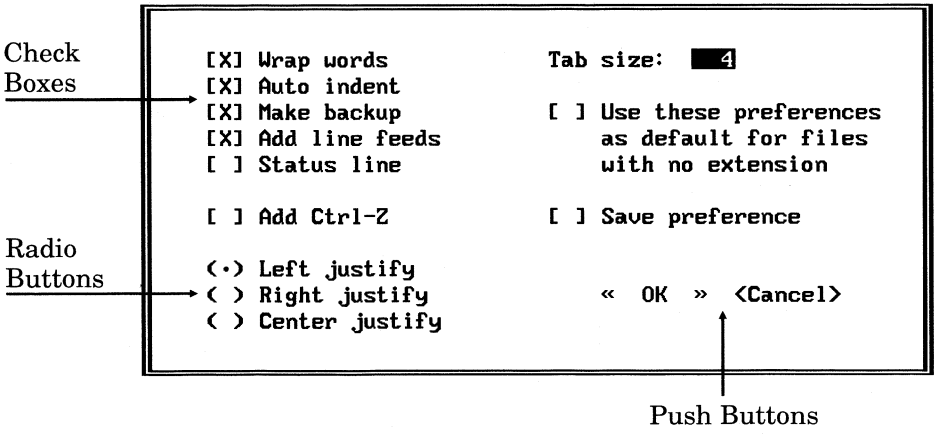
When you use the interface, you're actually generating commands in the Command window. You can also type commands directly in the Command window.

Using Dialogs with the Mouse

When you choose a menu option that is followed by an ellipsis (...), the box that appears is called a *dialog*. Dialogs also appear at other times during your FoxPro session when more information is required to complete a command or expression. A dialog requires you to provide additional information before a command can execute.

Dialogs contain a variety of *controls* that you use to designate, confirm or cancel actions. These controls are explained below. Using the mouse, you can move in dialogs by positioning the pointer, selecting and clicking the mouse button to choose.

Once a dialog is displayed, you must exit it before you can use any other features of FoxPro. To exit a dialog, choose the appropriate push button or press Escape (to cancel the dialog). If a dialog is displayed and you try to perform an action outside of it, other than select an active menu pad, the computer beeps.



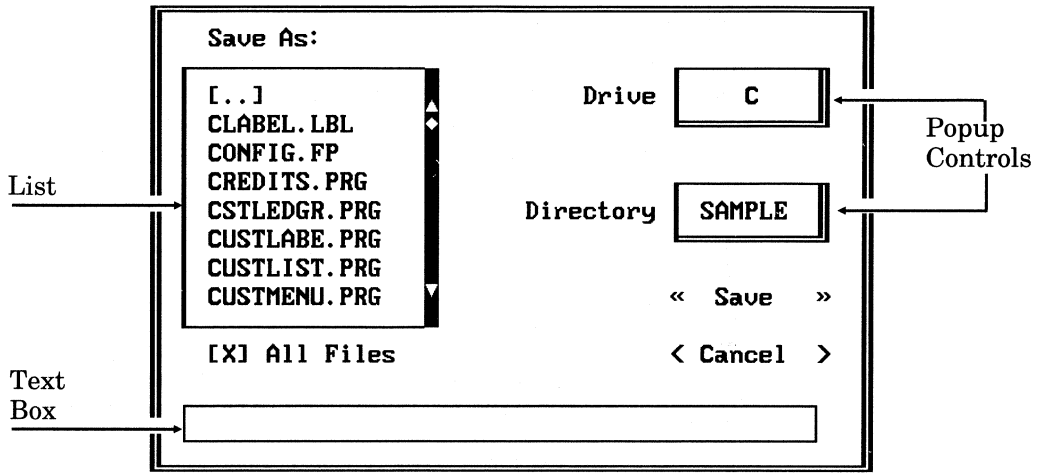
Preferences Dialog

Push Button – A *push button* is enclosed in angle brackets, as shown, and contains key words that describe the action it triggers. The action associated with a push button occurs immediately when you choose a push button unless it contains an ellipsis (...). The ellipsis indicates that another dialog will appear.

The « » push button (with double angles) is the default push button. To choose the default push button, click with the mouse or press Ctrl+Enter.

Check Box – A *check box* is a pair of square brackets followed by text. Settings can be turned on and off by clicking the check box with the mouse. If a check box has an X in it, the setting is on. More than one box in a group can be checked at once.

Radio Button – A *radio button* is a set of parentheses followed by text. Unlike check boxes, only one radio button in a group can be chosen at any given time. Click a radio button to choose it. When a radio button is chosen, a bullet appears in the parentheses and any previously chosen radio button in the group becomes deselected.



Save As Dialog

Popup Control – This rectangle with double lines on the right and bottom edges, as shown, is a *popup control* that you can choose to display the associated menu popup.

To display the popup, point to the popup control and hold down the mouse button. Once a popup is displayed, drag to select the appropriate option and release the mouse button. The option is chosen.

List – This box contains a list of items like directories, files and fields that you can select. If necessary, click on the arrow at either end of the scroll bar to move through the list. Click on the desired item to select it. Now you can choose the appropriate push button.

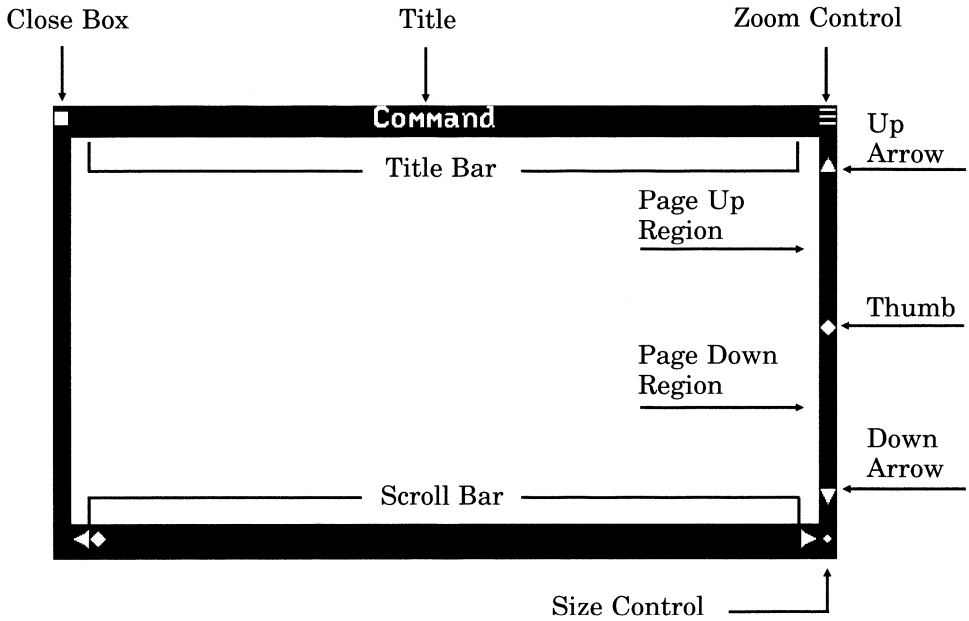
Text Box – This bar indicates where you may enter text. To enter text in a text box, click on the text box to position the cursor. Type and edit as usual.

Repositioning Dialogs on the Screen

Dialogs can be repositioned on the screen. To move a dialog using the mouse, point to the top border and drag until the dialog is in the desired location. Release the mouse button.

Controlling System Windows with the Mouse

FoxPro system windows can be manipulated in several ways. Besides opening and closing a window, you can hide, move, size, zoom and scroll most windows.



Command Window

Open

Windows can be opened in a variety of ways. The Command window is automatically opened when you begin a FoxPro session. If you close the Command window, you can open it again by choosing **Command** from the **Window** menu popup. The Debug, Trace and View windows can be opened by choosing their names from the **Window** menu popup. You can open a Browse window by choosing **Browse** from the **Database** menu popup. In the View window, you must click the **Browse** push button, choose **Browse** from the **Database** menu popup or double-click on a work area with an open database to open a Browse window. To *double-click*, press and release the mouse button two times in succession.

To open other system windows, choose **Open...** from the **File** menu popup. The Open File dialog appears. See the File Menu chapter for more information about the Open File dialog.

When you open a window, it becomes the frontmost window on your screen. You can recognize the frontmost window because it is the only window with controls drawn on it and its title appears different than any other window titles. The names of open windows are listed at the bottom of the **Window** menu popup if the window name is not already an option on the **Window** menu.

Close

To close an open window, choose **Close** from the **File** menu popup or click the close box. The close box is located in the upper left corner of all system windows. When a window is closed, you can no longer see its contents.

To close all open windows, hold down Shift and choose **Close All** from the **File** menu popup.

Hide

Hiding a window makes it invisible *without closing it*. To hide a window, choose **Hide** from the **Window** menu popup.

If you wish to hide or display all open windows, hold down the Shift key and display the **Window** menu popup. The **Hide** option is replaced with options that allow you to **Hide All** windows and **Show All** windows.

To momentarily hide all windows in front of the current output window (which may be the screen), hold down Shift+Ctrl+Alt.

To display a hidden window again, choose its name from the bottom of the **Window** menu popup. If the window is a memo editing window, program editing window, text editing window, Report Layout or Label Layout window, its contents will appear the same as when the window was hidden.

User-defined windows can be hidden by choosing **Hide** from the **Window** menu popup or by using the HIDE WINDOW command. If a user-defined window is defined with the CLOSE option, you can also hide it by holding down the Shift key and clicking the mouse on the close box in the upper left corner of the window.

To redisplay a hidden user-defined window, choose its name from the bottom of the **Window** menu popup or use the SHOW WINDOW command.

Move

To move a window to a new location, position the pointer on the window title, hold the mouse button down and drag the window. When the window is in its new location, release the mouse button.

When you have several windows (system or user-defined) on the screen at one time, moving a window with the mouse brings the window to the front of all the windows. To move a window and maintain its position relative to other windows, hold down the Shift key and drag the window with the mouse. The window will pass behind or in front of other windows, maintaining its position relative to other windows.

Size

To change the size of a window, use the size control. The size control is located in the lower right corner of a window. To size a window, position the pointer on the size control, hold down the mouse button and drag until the window is the desired size.

Zoom ↑

The **Zoom** ↑ option from the **Window** menu popup and the zoom control in the upper right corner of the window act as a toggle between current window size and full screen size.

Zoom ↓

To minimize a window, choose **Zoom** ↓ from the **Window** menu popup or double-click the mouse on the top border of the window. The window becomes one line tall by 16 characters wide with the title of the window displayed.

To minimize and "dock" the window in the lower right corner of the screen, do one of the following:

- Hold down the Shift key and double-click the mouse on the top border of the window.
- Hold down the Shift key and choose **Zoom** ↓.

To return a minimized window to its original size, do one of the following:

- Double-click the mouse on the top border of the window.
- Choose **Zoom** ↓ from the **Window** menu popup.

Cycle

Cycle refers to the process of rearranging open windows to bring successive ones forward. Choose **Cycle** from the **Window** menu popup as many times as necessary to bring the window of your choice to the front. You can also click on the desired window to bring it forward. You may have to move and size overlapping windows so that you can bring the desired window forward.

Scroll

Scroll bars are located along the right edge and, sometimes, along the bottom edge of system windows. Click the arrows at either end of the scroll bar to move through the contents of a window a little at a time. Click one time in the page up or page down region to move up one page or down one page. Drag the diamond-shaped thumb to move through the window contents rapidly. The position of the thumb also indicates your position in the file. When the thumb is in the middle of the scroll bar, the data in your window is from the middle of your file.

Command Window

The Command window is a FoxPro system window. When you choose options from menu popups, you're actually generating FoxPro commands in the Command window.

You can also type FoxPro commands directly in the Command window — just position the cursor in the Command window and type. Press Escape to delete text you've typed in the Command window if you haven't pressed Enter yet.

FoxPro stores all commands in a history list so that you can recall, edit and re-execute them. Commands can be recalled by scrolling through the Command window until you find the command. To re-execute a command, position the cursor anywhere on the appropriate command line and press Enter.

To edit a command, scroll through the Command window until you find the appropriate command. Add, delete or change any information in the command using FoxPro's text editing capabilities. For more information, refer to the Text Editor section of this chapter.

Command Continuation

Lengthy commands, such as a SQL SELECT command or a BROWSE with multiple options, frequently extend beyond the right margin of the Command window. When this happens, you can split the command onto multiple lines for easier editing and viewing. Lines in programs can also be split in the same manner.

To keep a long command from extending beyond the right margin in the Command window:

1. Type a semi-colon (;) where you want to split the command. The semi-colon must follow a space in the command.
2. Press Enter to move the cursor to the next line in the Command window.
3. Type the remainder of the command.

Although your command is now on more than one line, FoxPro reads the separate lines as a single command. To execute a command split onto multiple lines, place the cursor at the end of the command and press Enter.

Automatic Indentation

Automatic indentation is available when you enter commands in the Command window. Auto indent allows you to easily construct indented program code.

To indent a command in the Command window, press Tab. You may press Tab repeatedly for additional indentation.

After a line is indented in the Command window, any continuation lines are automatically indented the same amount when you press Enter.

Indentation greatly improves the readability of commands split onto multiple lines in the Command window. See the discussion on command continuation above for information on splitting commands onto multiple lines.

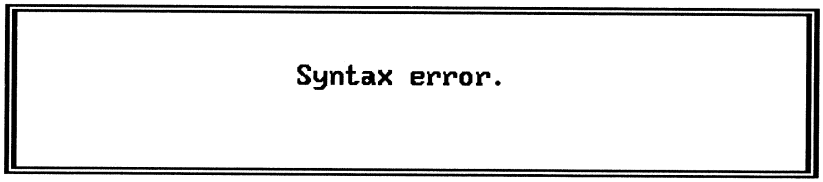
Alerts

An alert is a box that contains a warning or an error message. It appears on the screen when you ask the computer to do something it can't do, or you're about to do something that will destroy information.

Alerts can be repositioned on the screen. To move an alert using the mouse, point to the top border and drag until the alert is in the desired location. Release the mouse button.

To move an alert using the keyboard, press Ctrl+F7. The border flashes. Use the arrow keys to move the alert by small increments in the desired direction. Press PgUp or PgDn to move the alert to the top or bottom of the screen. Home or End moves the alert to the left or right edge of the screen. When you're finished, press Enter. The border stops flashing.

One example of an alert is shown below:

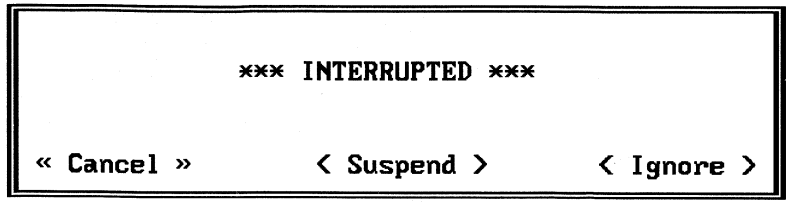


If the alert contains no push buttons, use one of the following methods to remove it from the screen:

- Click the mouse button.
- Press any key except for function keys, modifier keys (Ctrl and Shift) and Alt.

Now you can continue the action you were involved in before the alert appeared.

Another example of an alert is shown below:



If the alert contains push buttons, use one of the following methods to remove it from the screen:

- Click the mouse button on the appropriate push button.
- Tab to the appropriate push button and press Enter.

System Messages

A system message is a box that contains information about the action you are performing. It differs from an alert because the information is not in the form of a warning or an error message.

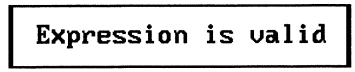
Use one of the following methods to remove a system message from the screen:

- Move the mouse.
- Press Shift or Ctrl. Pressing either of these keys has no effect on the current text area.

The "Press any key to continue" message is an exception. You can *momentarily* hide it by pressing Shift or Ctrl. When you release Shift or Ctrl, this message reappears. You must press a different key or the mouse button to continue. This particular system message can be moved in the same manner as an alert.

Another exception is the "Recording..." message that appears when you are recording a new macro. This message cannot be hidden.

After you remove the system message from the screen, you can continue the action you were involved in before the message appeared. An example of a system message is shown below:



Shortcuts for Menu Options

FoxPro provides shortcuts for choosing menu options. These shortcuts are called hot keys and Control keys.

You can use hot keys to choose a menu option once the appropriate menu popup is displayed. A hot key is a letter that is highlighted. First, press Alt (or F10) and press the hot key in the menu pad name to display the menu popup. Notice that each available menu option contains a hot key. Instead of using the arrow keys and Spacebar to choose an option, press the appropriate hot key.

Control key shortcuts allow you to choose certain menu options without displaying the menu popup. All you need to do is press the Control key combination that is listed next to the desired option on the menu popup. Control key shortcuts are listed on the following page.

Control Key Shortcuts	
Key	**Action**
Ctrl+A	Select All
Ctrl+C	Copy
Ctrl+D	Do
Ctrl+E	Replace and Find Again
Ctrl+F	Find
Ctrl+G	Find Again
Ctrl+K	Continue
Ctrl+M	Resume
Ctrl+Q	Same as Escape
Ctrl+R	Redo
Ctrl+Z	Undo
Ctrl+V	Paste
Ctrl+W	Exit current edit and save any modifications
Ctrl+X	Cut
Ctrl+F1	Cycle windows
Ctrl+F2	Display Command window
Ctrl+F7	Move window
Ctrl+F8	Size window
Ctrl+F10	Zoom window
Escape	Exit current edit without saving modifications; exit dialog without taking action

Function Keys

The default values assigned by FoxPro to the function keys F1 through F10 are listed below.

Key	Function
F1	(Activate online help)
F2	Set
F3	List
F4	Dir(ectory)
F5	Display Structure
F6	Display Status
F7	Display Memory
F8	Display
F9	Append
F10	(Activate/deactivate the system menu bar — same as Alt)

You can assign new values to F1 through F10 by choosing **Macros...** from the **System** menu popup or with the SET FUNCTION command. Function keys beyond F10 are not supported in FoxPro.

Text Editor

A text editor allows you to type and modify text. In FoxPro, you can edit text in program, text and memo editing windows, in the Command window and in dialog text editing regions and text boxes. Eight basic keys and two modifier keys, Shift and Ctrl, control all cursor action in the editor.

The FoxPro editor is handy to use for all sorts of text manipulation. It has a variety of features that allow users to enter and modify text. The FoxPro editor:

- Handles very large files
- Opens as many windows as memory allows
- Cuts, copies and pastes text within files and between files
- Searches for strings
- Wraps words
- And more

You can easily modify the FoxPro editor to behave like your favorite word processor using keyboard macros. Macros are discussed in the System Menu chapter of this manual.

Creating a New File

To create a new file, choose **New...** from the **File** menu popup. A dialog appears with a list of file types.

Because you want to edit text, choose either the **File** radio button (to create a text file) or the **Program** radio button (to create a program file).

Choose the **OK** push button to verify your choice. An UNTITLED editing window appears and you are ready to begin entering text.

If you want to learn about the command to create a text or program file, refer to MODIFY COMMAND/FILE in the FoxPro *Language Reference.*

Opening an Existing File

To open an existing file for editing, choose **Open...** from the **File** menu popup. A dialog appears with a list of available files.

From the **Type** popup, choose the type of the file you wish to edit (**File** or **Program**) to list all files of that type.

If the file you wish to edit is not located in the current directory, choose the desired directory from the **Directory** menu popup. The new directory now appears on the popup control and the options in the list correspond to the new directory.

Similarly, you can change the current drive. Choose the appropriate drive from the **Drive** menu popup. The options on the list now change to correspond to the selected drive.

Once you have found your file in the list, select it.

Choose the **Open** push button to display your file in an editing window.

If you want to learn about the command for opening text or program files, refer to MODIFY COMMAND/FILE in the FoxPro *Language Reference.*

Naming, Saving and Closing a New File

It is important to save a new file in case you want to change it later or use it again.

To save an UNTITLED file, choose **Save as...** from the **File** menu popup. A dialog appears.

Use the **Drive** and **Directory** popups if you need to change the drive and directory where your file will be saved.

Select the text box at the bottom of the dialog. Type a meaningful name for your file and include the appropriate extension (.TXT or .PRG). For example, a text file containing a letter could be named LETTER.TXT.

After you've named your file, choose the **Save** push button.

Once your file is saved, you can close it and move on to other work. Choose **Close** from the **File** menu popup or click the close box with the mouse. Now you are ready to create another file or edit an existing file.

Saving and Closing an Existing File

While editing text, it is important to save your changes frequently. It is also important to save your changes when you have finished editing and are ready to close a file.

To save an existing file, choose **Save** from the **File** menu popup.

If you wish to save another copy of an existing file under a new name, choose **Save as...** from the **File** menu popup, replace the current name of the file in the text box, and choose the **Save** push button.

Once the changes are saved, you can close the file. Choose **Close** from the **File** menu popup or click the close box with the mouse.

Cursor Movement

When editing text, you can move through it and see any portion of the data being edited. You move through text by positioning the cursor. The cursor looks like a flashing underscore when in insert mode and a flashing box when in overwrite mode. Press the Insert key to switch between insert and overwrite mode.

It is simple to move the cursor through text using eight basic keys. Four of these keys can also be used in combination with a modifier key, Ctrl, to move the cursor a greater distance. The cursor movement keys used in FoxPro are listed on the following page.

Cursor Movement Keys	
Key	**Action**
Right Arrow	Moves cursor one character to the right.
Left Arrow	Moves cursor one character to the left.
Up Arrow	Moves cursor up one line.
Down Arrow	Moves cursor down one line.
PgUp	Moves cursor up one window of text.
PgDn	Moves cursor down one window of text.
Home	Moves cursor to beginning of current line.
End	Moves cursor to end of current line.
Ctrl+Right Arrow	Moves cursor one word to the right.
Ctrl+Left Arrow	Moves cursor one word to the left.
Ctrl+Home	Moves cursor to beginning of text.
Ctrl+End	Moves cursor to end of text.

If your system is equipped with a mouse, you can also move through text using the scroll bars at the right and bottom edges of the windows. Click on the arrow at either end of the scroll bar, depending on the direction you want to move. Drag the diamond-shaped thumb to move through a window more quickly. To position the cursor in the text, use the mouse to point and click.

Entering Text

Before you type text in FoxPro, you must position the cursor in the appropriate location. Any text you type appears wherever the cursor is located.

A computer keyboard resembles a typewriter and works similarly. When typing in FoxPro, however, you don't have to press Enter every time the cursor reaches the right edge of the window. You can make FoxPro wrap words, which means that if a word is too long to fit at the end of a line, it is automatically moved to the next line. You only need to press Enter to start a new paragraph.

To make FoxPro wrap words in an open window, choose the **Preferences...** option from the **Edit** menu popup. Check the **Wrap words** check box and choose **OK**.

Selecting Text

You can use the keyboard or the mouse to select text for editing. *Selecting* text highlights it and prepares it to be moved, copied, deleted or replaced. Text can be selected and deselected as many times as you like without making any changes.

The cursor marks the location where actions will occur. To select text, you must position the cursor in the text where you want to begin editing. For more information about moving the cursor, refer to Cursor Movement in this chapter.

Selecting and Deselecting with the Keyboard

Before you select text using the keyboard, position the cursor in the text where you want the selection to begin. For more information about the cursor movement keys, refer to Cursor Movement in this chapter.

To select text for editing, use the keystroke combinations listed in the following table. Notice that the key combinations used to select text are simply the cursor movement combinations with Shift added to them. Shift, together with a cursor movement combination, selects from the cursor location to the point to which the cursor has moved.

When you use the keystroke combinations below, hold down the appropriate modifier key(s) before pressing the final key in the sequence. For example, to select text from the cursor to the end of the text, hold down Shift and Ctrl, then press End.

Key Combinations for Selecting Text	
Key	**Action**
Shift+Arrow (Left/Right)	Selects one character at a time.
Shift+Arrow (Up/Down)	Selects one line at a time.
Shift+Ctrl+Arrow (Left/Right)	Selects from cursor to beginning/end of word.
Shift+Ctrl+End	Selects from cursor to end of text.
Shift+Ctrl+Home	Selects from cursor to beginning of text.
Ctrl+A	Selects all text.

To deselect text that has been selected for editing, press any cursor movement key.

Selecting and Deselecting with the Mouse

To select text with the mouse, position the pointer on the character where you want the selection to begin.

Drag to the right by holding down the mouse button and moving the mouse, then releasing the mouse button. As you drag the mouse, each letter you pass over becomes highlighted. Dragging down highlights entire lines of text. The text continues to be selected until you release the mouse button.

Shortcuts for selecting text follow:

- *Select a word* by positioning the pointer on the word and double-clicking. To double-click, press and release the mouse button two times in succession.
- *Select a line* by positioning the pointer on a line and triple-clicking. To triple-click, press and release the mouse button three times in succession.

- *Select text word-by-word* by double-clicking and dragging. This is the same action as a double-click except on the second click you don't release the mouse button. Instead, you continue to hold the mouse button down and drag.
- *Select text line-by-line* by triple-clicking and dragging. This is the same action as a triple-click except on the third click you don't release the mouse button. Instead, you continue to hold the mouse button down and drag.
- *Select a segment of text* by positioning the cursor then Shift+clicking at another location to select everything from the original cursor location to the Shift+click location. To Shift+click, hold down the Shift key and press the mouse button.
- *Select all text* by pressing Ctrl+A.

Text can be deselected in a variety of ways:

- *Deselect a segment of text before you release the mouse button* by dragging the pointer back over the selected area.
- *Deselect a segment of text after you release the mouse button* by Shift-clicking in the selected text at the point where you want the selection to end.
- *Deselect an entire selection* by placing the pointer in the window anywhere outside the selected area and clicking.

Deleting Text

The keys used for deleting text are described below.

Backspace — If nothing is selected, pressing the Backspace key erases the character to the immediate left of the cursor. If text is selected, pressing Backspace erases the selection.

Ctrl+ Backspace — Erases the word in which the cursor is positioned. If the cursor is positioned on a blank space following a word, the space and the previous word are erased.

Delete — If nothing is selected, pressing the Delete key erases the character that the cursor is on. If text is selected, pressing Delete erases the selection.

To delete part of a command in the Command window when the command extends out of sight, position the cursor at the beginning of the text to be deleted and select down to the following command, stopping before you select the following command. Now press Enter to replace the selected portion of the command with a carriage return.

Pressing Enter instead of Backspace separates the two commands immediately, without executing them. If you had pressed Backspace then Enter, the command would execute because no text was selected for the carriage return to replace.

Inserting Text

When you begin a FoxPro session, the cursor is in insert mode. Pressing the Insert key allows you to switch between insert and overwrite mode.

The cursor looks like a flashing underscore when you are in insert mode. When you type a character in insert mode, it appears at the cursor location and the original text moves one position to the right.

The cursor is a flashing, solid box when you are in overwrite mode. In overwrite mode, each character you type replaces the character that the cursor is on.

When text is selected, typing any characters (except editor control characters) replaces the selected text with the typed text.

Inserting Special Characters

Because many control characters are used to control the editor itself, FoxPro has a special method to let you insert control characters into editor files. This is particularly useful if you wish to insert the graphic associated with a particular control character.

To insert a control character, press the ‘ key (left single quote) followed by the letter that would normally follow Ctrl. For example, Ctrl+Q is inserted into a file by typing ‘Q. To enter ‘ itself, you must type ‘ twice.

High-bit characters used to create boxes and other graphics may be entered directly in editor files by holding down the Alt key and typing the (decimal) key code of the desired character.

Any of these characters can be modified once they are entered.

Cutting, Copying, Pasting

Text can be reorganized within and moved among windows, dialog text editing regions and dialog text boxes using **Cut**, **Copy** and **Paste**. When text is cut or copied, it is placed in a temporary storage location called the *clipboard*. To use text from the clipboard, you must paste it.

Cut Removes a piece of selected text for placement in a different location. After you select the appropriate text, choose **Cut** from the **Edit** menu popup (or press Ctrl+X) to remove the text from your window, dialog text editing region or dialog text box and place it on the clipboard.

Copy Duplicates an existing portion of text for use in another location. After you select the appropriate text, choose **Copy** from the **Edit** menu popup (or press Ctrl+C) to make a copy of the text and place it on the clipboard. You can use this option in text files and memo fields when you want to see if a piece of text will look better in one place than in another, or in programs when you are repeating the same segment of code in many places.

Paste Places cut or copied text into a file at the cursor location. Before pasting, position the cursor in the file where you want the text to be placed, or select the text in the file that you want the cut/copied text to replace. Choose **Paste** from the **Edit** menu popup (or press Ctrl+V) to place the text in the file. You can continue to paste the same text over and over throughout the document by moving the cursor and choosing the **Paste** option.

To **Paste** from one window to another, **Cut** or **Copy** the text using the methods described. Then, using the mouse or the keyboard, select the window and location where you want the text to appear and position the cursor at that location. Choose **Paste** from the **Edit** menu popup and the text appears in the new window.

You can also **Cut**, **Copy** and **Paste** from dialog text editing regions and dialog text boxes to windows and vice versa, using the same methods.

Undo and Redo

FoxPro keeps track of all the editing actions you make in text editing windows, program editing windows, memo editing windows, the Command window, dialog text editing regions and dialog text boxes starting at the beginning of each editing session. **Undo** is used when you've changed your mind about a text editing action and you would like to reverse it.

To reverse the most recent text editing action, choose **Undo** from the **Edit** menu popup (or press Ctrl+Z). You can continue to **Undo** (in reverse order) all text editing actions that you've made since you opened the file or saved it during the editing session, one at a time, by choosing **Undo** from the **Edit** menu popup.

Redo allows you to reverse the most recently undone command. Choose **Redo** from the **Edit** menu popup (or press Ctrl+R) to reverse the most recent **Undo**.

For a complete description of **Undo** and **Redo**, refer to Edit Menu chapter.

Find and Replace

When you want to find and/or replace a word or phrase that appears throughout a text file, program file, memo field or the Command window, choose the appropriate find and replace command from the **Edit** menu popup. Below are descriptions of the find and replace commands available in the FoxPro text editor:

Find... Begins to search for text at the cursor location. To locate text, choose **Find...** from the **Edit** menu popup (or press Ctrl+F). The Find dialog appears. Type a segment of text that you want to Look For in the text box. If you also want to replace the text segment, type the new text in the Replace With text box.

When searching for text segments, you can tell FoxPro to search forward or backward, ignore upper- and lower-case, to match whole words only (not portions of words as well), and/or to continue (wrap) to search from the beginning of the file when the end is reached.

Once you have entered the necessary information in the dialog, choose the **Find** push button.

Find Again Continues to search the remaining text after a matching text string is found. Choose **Find Again** from the **Edit** menu popup (or press Ctrl+G) to continue your text search from the current cursor position. This menu option is only enabled once a **Find...** has occurred.

Replace And Find Again Replaces a matching string of Look For text with the Replace With text that you specified in the Find dialog. Then, it continues to search for the next occurrence of matching text. To perform this operation, choose **Replace And Find Again** from the **Edit** menu popup (or press Ctrl+E). This menu option is only enabled once a **Find...** has occurred.

Replace All Replaces every occurrence of a matching string of Look For text in the current file with the Replace With text that you specified in the Find dialog. This menu option is only enabled once a **Find...** has occurred.

Setting Editor Preferences

The **Preferences...** option on the **Edit** menu popup allows you to change certain settings that are in effect during editing sessions. You can make the preferences apply to only the current file you are editing, or to all files of that type created in the future.

Choose **Preferences...** from the **Edit** menu popup to display the Preferences dialog. The options in this dialog are described below.

Wrap words Automatically moves text displayed in the editing window to the next line when it reaches the right margin, instead of continuing the text, unseen, beyond the right margin. When **Wrap words** is not checked, text that extends beyond the right margin can be accessed by scrolling. If you are editing a program file, it is best to make sure that **Wrap words** is not checked. Also, be sure to press Enter after each program command.

Auto indent Allows you to easily construct indented programs. Pressing the Enter key when **Auto indent** is on moves the cursor to the next line and automatically indents that line by the same amount as the previous line.

To stop indenting, press Shift+Enter and the insertion point moves to the left margin on the next line.



When **Wrap words** and **Auto indent** are both checked, FoxPro automatically indents wrapped text in each paragraph by the same amount as the first line of the paragraph. For example:

- When a paragraph begins with a Tab, any wrapped lines are aligned with the Tab.
- When a paragraph begins with a number (or other text) followed by a Tab and text, any wrapped lines are aligned with the Tab.
- When the first line of a paragraph is indented using the Spacebar, any wrapped lines are indented by the same amount as the first line.

Make backup Automatically stores the previous version of an edited text or program file in a backup file (with a .BAK extension).

Add line feeds Saves files using a carriage return and line feed at the end of all lines. When this check box is deselected, files are saved without line feeds and carriage returns so that they can be exported to other computers.

Status line Adds a status line at the top of the editing area. When this check box is chosen, a bullet appears in the upper left corner of the editing area if the text has been modified since it was last saved. The cursor's line and column positions are displayed. (Line position of the cursor is displayed only when **Wrap words** is off.) The active edit modes are indicated: Insert mode (Ins), Overwrite mode (Over), Numlock mode (Num) and Capslock mode (Caps).

Compile when saved This preference is only available for program files and instructs FoxPro to compile the file after it is saved. If this is not checked, the program is not automatically compiled until it is executed.

Add Ctrl-Z When this is chosen, a Ctrl+Z is placed at the end of a file when the file is saved.

When this box is not checked, files are read and written in their entirety even if they contain Ctrl+Z. The Ctrl+Z character will be read or written right into the file.

Left justify Aligns all text at the left edge of the window.

Right justify Aligns all text at the right edge of the window.

Center justify Centers each line of text in the window.

Tab size Sets the distance (in number of spaces) that the cursor will advance when the Tab key is pressed. The default is 4. When you change the **Tab size**, all tabs in the file will be updated to reflect the change.

Use these preferences... Designates that all preference settings should be used as defaults with new text, program or memo editing windows.

Save preference Stores the preference settings in the resource file so that each time you open the file, it appears as you left it at the end of the last editing session. This option also stores the window size and position, as well as the cursor location.

Memo Editing

Before you can edit the contents of a memo field in a database, you must open it in a memo editing window. Memo editing windows can be opened through the Browse window in Browse, Append, Insert and Change mode. To open a memo editing window, select the desired memo field and do one of the following:

- Press Ctrl+PgDn.
- Double-click.

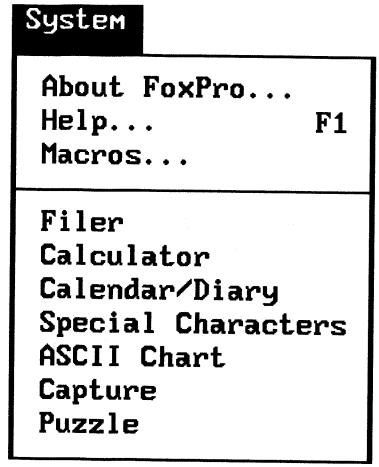
A memo editing window appears. Use standard FoxPro editing techniques to update the contents of the memo editing window.

When you close a memo editing window, your changes are automatically saved. To close a memo editing window, click the close box, choose **Close** from the **File** menu popup or press Ctrl+W.

For more information about editing memo fields, refer to MODIFY MEMO in the FoxPro *Language Reference*.

2 System Menu

System menu options inform you about FoxPro, allow you to create macros, or access built-in FoxPro desk accessories.



System Menu

About FoxPro...

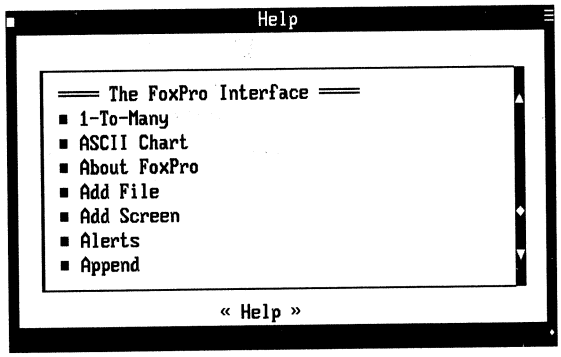
Product revision

About FoxPro... displays revision information and the serial number of your copy of FoxPro. You will need to provide this information if you call Fox Software for technical assistance. Click the mouse button or press Enter to remove this information from your screen.

Help...

On-line help

Help displays the *topics level* of the FoxPro Help window. You can also display the Help window by pressing F1 or by typing HELP in the Command window.



Topics Level of the Help Window

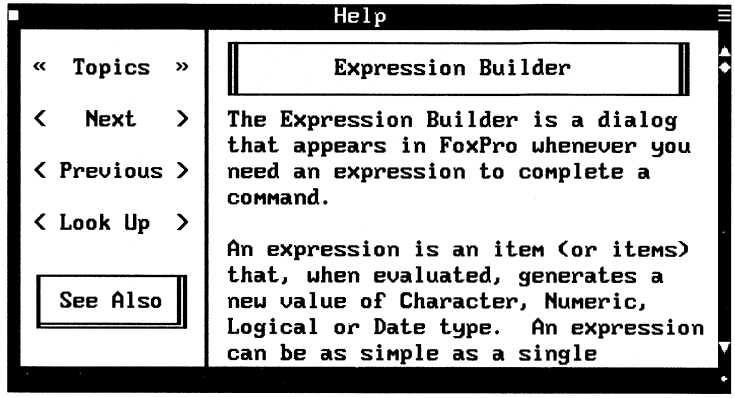
The topics level of the Help window lists general topics, commands, functions, system memory variables and interface items. The window is arranged in this order:

- General topics, preceded by triangular bullets (➤)
- Commands and functions, intermixed alphabetically
- System memory variables
- Interface items, preceded by square bullets (■)

The Help window is a standard FoxPro window that can be scrolled, moved, sized and closed.

To find the topic you want, you can scroll through the list. Or, while you are in the Help window, type a letter or series of letters to select the first list item beginning with the specified letter(s). To select the first item at the top of the memory variables list, type an underscore because all system memory variables begin with an underscore. To select the first item at the top of the list of interface items, hold down the Alt key and press 254 on the key pad. (The Alt+254 key combination forms the square bullet.)

To see help details for a topic, select the topic and choose **Help**, select the topic and press Enter or double-click on the topic with the mouse or the Spacebar. The *details level* of the Help window displays information for that topic.



Details Level of the Help Window

If more information is available on a topic than fits in the window, use the scroll bar, Up/Down Arrow keys or PgUp/PgDn to see the rest.

To return to the topics level of the Help window and select another topic, choose **Topics**. To see information about the next topic in the topics list, choose **Next**. To see information about the previous topic, choose **Previous**.

Look Up and See Also

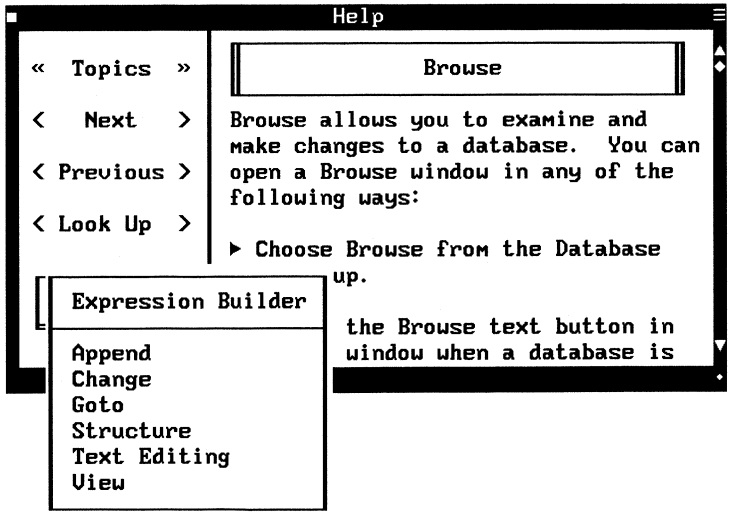
The *details level* of the Help window has a **Look Up** push button and a **See Also** popup. These controls provide you with links among related help topics. For example, if you need more information about a key word in the help details, select the word and choose the **Look Up** push button. (For **Look Up** to be enabled, a word or portion of the help text must be selected.) If the selected word is a help topic, help information appears for the word.



When you highlight text in the details of an interface topic and choose **Look Up**, FoxPro only looks for help information about the highlighted text in the interface topics list.

If a word is selected and a corresponding help topic cannot be found, a dialog is displayed. At the top of the dialog, the message "No help found for <topic>" appears. The topic highlighted in the dialog's list is the one that most closely matches your selected topic. You may choose this topic or another topic from this list.

When the current help topic is related to at least one other topic in the help file, the **See Also** popup is enabled. When you choose an option from the list of related topics on this popup, help information for the option appears, and when the **See Also** popup is displayed again, it is divided into two sections.



See Also Popup Displayed in Help Window

Topics previously selected from the **See Also** popup appear on the upper portion of the popup, and you can choose from this portion to retrace your path. Choose from the lower portion of the popup to see information about additional topics related to the current topic.

Context-Sensitive Help

FoxPro provides context-sensitive help. To receive help on a system window or dialog using the keyboard, press F1 when the window or dialog is frontmost. Help information on that feature appears. To receive help on a menu option, select the menu option and press F1.

To receive help on a system window, dialog or menu option using the mouse, hold down the Alt key, point to the window, dialog or menu option and click the left mouse button. Help information on that feature appears.

When you *select text* in any editor session or in the Command window, you can display help for the selected topic by holding down Alt and clicking the left mouse button on the window that contains the selected text, or pressing F1 when the window is frontmost. If a corresponding help topic cannot be found for the selected text, the topic that most closely matches your selected text will appear.

When an editing window or the Command window is frontmost and *no text is selected*, holding down Alt and clicking the mouse button or pressing F1 displays the first item in the topics level of the Help window.

Copy and Paste from Help



Text in the details level of the Help window can be copied and pasted into program windows, text windows, memo windows and the Command window. This is quite useful when you can't remember the exact syntax of a command. You can copy and paste the syntax from the Help window, then insert the file names and expressions necessary to complete the command. You may want to paste commonly used information, such as a complex date expression you create for use in reports, in the help database so you can access it through the Help window.

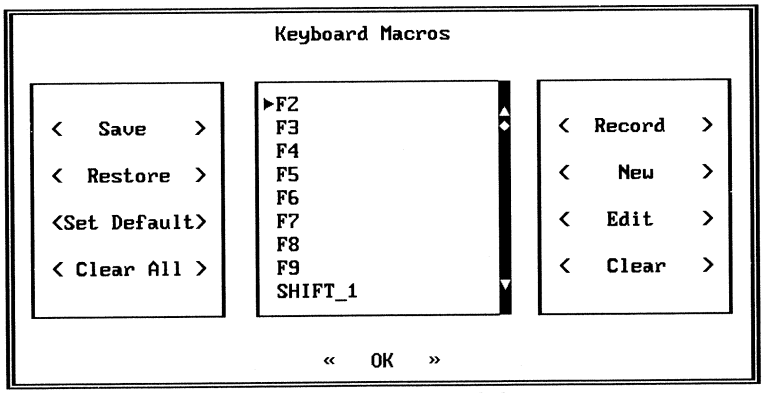
Help Database

Help is a complete mini-reference on FoxPro. In fact, the help information is stored in a standard FoxPro database (FOXHELP.DBF and FOXHELP.FPT). If you SET HELP OFF you can open FOXHELP.DBF and manipulate it like any other FoxPro database — you can display the information, edit it, delete it and copy it.

Macros...

Define custom keyboard shortcuts

Macros... displays the Keyboard Macros dialog. Using this dialog, you can define Ctrl key, Alt key or function key combinations to perform a desired series of keystrokes. These key combinations you define are called macros.



Keyboard Macros Dialog

Macros can greatly simplify your interactions with FoxPro and save you time during data entry. When you press a macro key combination, FoxPro executes the series of defined keystrokes just as if you had typed them. Individual macros can be combined in macro sets and stored in files.

Macros are handy to use when editing text. For example, you could define a macro to:

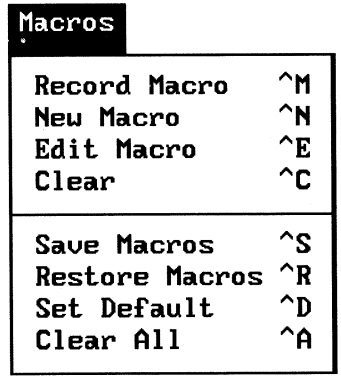
- Delete the line of text preceding the cursor
- Delete everything from the cursor position to the end of the text
- Insert a line of text at the top of a file, position the cursor at the bottom of the file and insert another line of text



You can make your work environment more comfortable by using macros to imitate the keystroke assignments of familiar products. For instance, if you are accustomed to using the word processor WordStar®, you might want to define macros to make the FoxPro text editor operate in a similar manner (that is, define Ctrl+F to move ahead one word).

The Keyboard Macros dialog contains a central list that displays the macros available for use. The four push buttons on the left side of the dialog, **Save**, **Restore**, **Set Default** and **Clear All**, perform actions on macro sets (groups of macros). The four push buttons on the right, **Record**, **New**, **Edit** and **Clear**, perform actions on individual macros.

When the Keyboard Macros dialog is displayed, a **Macros** menu pad is added to the menu bar. The **Macros** menu popup contains options and Control key shortcuts that correspond to each push button in the Keyboard Macros dialog.



Macros Menu

FoxPro's Default Macros

When you first load FoxPro, some macros already exist. FoxPro has its own default macros for the function keys F2 through F9 and the shift keys SHIFT_1 through SHIFT_9.

The values FoxPro assigns to F2 through F9 are listed in the Function Key Default Definitions table that follows. SHIFT_1 through SHIFT_9 highlight text when you press the Shift key and any cursor movement key on the numeric keypad. (If you use the numeric keypad to enter numbers, these macros can be cleared).

Function Key Default Definitions	
Key	**Function**
F2	Set
F3	List
F4	Dir(ectory)
F5	Display Structure
F6	Display Status
F7	Display Memory
F8	Display
F9	Append

Creating Macros

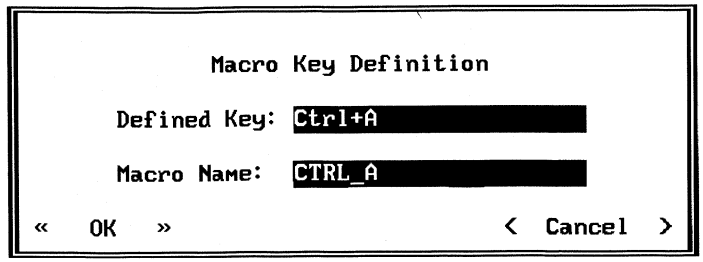
Macros can be created in two ways: automatically and manually.

When you create a macro automatically, you enter the key combinations that you want the macro to execute, and FoxPro automatically records your keystrokes much as a tape recorder records your voice.

When you create a macro manually, you type the keystrokes that you want the macro to execute into a text editing area.

Creating Macros Automatically

To automatically create a macro, choose the **Record** push button in the Keyboard Macros dialog or choose **Record Macro** from the **Macros** menu popup. The Macro Definition dialog appears. You can also press Shift+F10 at any time in FoxPro to display this Macro Definition dialog so you can create a macro. (By default, Shift+F10 displays the Macro Definition dialog, but you may redefine this key combination.)



Macro Definition Dialog

Press the key combination that will be used to activate the macro. FoxPro allows you to use any of the Ctrl key, Alt key or function key combinations in the following list:

- F1-F10, Ins, Del, Home, End, PgUp, PgDn or the arrow keys
- Shift plus F1-F9, Ins, Del, Home, End, PgUp, PgDn or the arrow keys
- Ctrl plus A-I, K-Z, F1-F10, Home, End, PgUp, PgDn or the Left and Right arrow keys. Ctrl+Q and Ctrl+S are not recommended.
- Alt plus A-Z, F1-F10
- Shift+Ctrl plus A-Z, F1-F10, Home, End, PgUp, PgDn or the Left and Right arrow keys. Shift+Ctrl+Q and Shift+Ctrl+S are not recommended.
- Shift+Alt, Ctrl+Alt or Shift+Ctrl+Alt plus A-Z or F1-F10.
- Alt+F10 plus A-Z.



Ctrl+Alt+Del and Shift+Ctrl+Alt+Del will reboot your computer!

When entering a key combination that contains the Shift, Ctrl and/or Alt keys, always press the keys in the order shown in the list above.

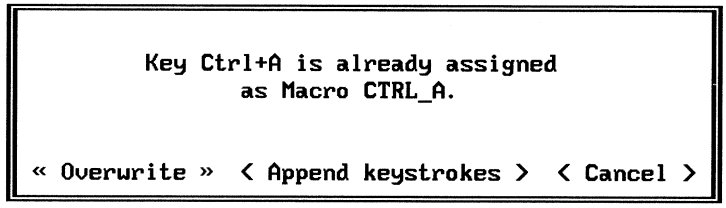
If you enter an invalid key combination, you'll hear a beep.

If you choose Alt+F10 as your key combination, a dialog appears and tells you to press a letter, a-z, to be part of the key combination. The letter you press is added to the entry in the Defined Key text box of the Macro Definition dialog.

The key combination you press appears in the Defined Key text box and the default macro name appears beneath it. If you want to rename the macro, type the new name in the Macro Name text box. Macro names are typical FoxPro names except that they may be up to 20 characters long.

Choose **OK** when you are ready to define the macro. If you would rather not define the macro, press Escape or choose **Cancel**.

If you try to define an existing key combination, the Overwrite Macro dialog appears. Choose **Overwrite** to replace the existing macro definition with your new definition. **Append keystrokes** allows you to add commands to the end of the existing macro. **Cancel** exits the Overwrite Macro dialog without taking any action.



Overwrite Macro Dialog

After you choose **OK** in the Macro Definition dialog (or choose **Overwrite** or **Append Keystrokes** in the Overwrite Macro dialog), a system message appears, displays the name of the macro you are defining and tells you that FoxPro is recording. Enter the keystrokes that you want the macro to execute.



If you want the macro to choose menu options, you must access the menu system using the keyboard while recording your macro. The macro will not record all of your actions if you use the mouse.

The maximum number of keystrokes for any single macro is 1,024. While you are recording, any keystroke you make is stored to the macro.

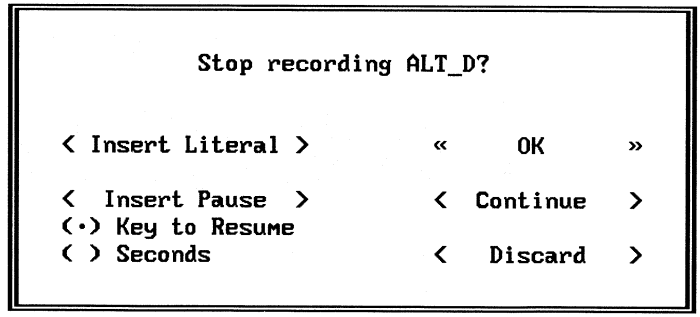
Example:

To define a macro that opens a specified text file, positions the cursor at the top of the file and adds a line of text, enter the following keystrokes:

Macro Keystroke	Result
Ctrl+F2	Display the Command window
MODI FILE TEST.TXT	Edit a text file titled TEST.TXT
Ctrl+Home	Position cursor at beginning of TEST.TXT file
To be or not to be?	Enter text

Every time you use this macro, FoxPro executes this series of commands.

When you finish creating the macro, press Shift+F10 to stop recording. A Stop Recording Macro dialog appears.



Stop Recording Macro Dialog

Although you will not always need to, at this point you may want to insert a literal or a pause in your macro.

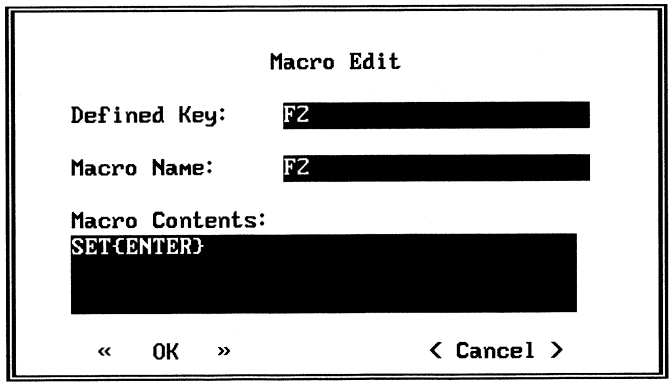
Insert Literal records the literal meaning of the next keystroke. You would use this to record the literal meaning of a key instead of a meaning currently assigned to it with a macro. This is especially handy when you want to circularly define two keys. To do so, choose **Insert Literal**, and then press the key.

Insert Pause records a pause in the macro. Before you choose **Insert Pause**, make sure that the appropriate radio button is chosen. If **Key to Resume** is chosen, you'll be prompted to press a key to resume execution of the macro after a pause has occurred. The key you press to resume the macro may be specified with the SET MACKEY command. **Seconds** allows you to specify how long the pause will last before execution of the macro resumes automatically. The default length for a pause is one second.

Discard erases the macro that you were creating. **Continue** returns you to the point you were at before the Stop Recording Macro dialog appeared so you can continue adding commands to the macro you are recording. **OK** confirms that you have completed the macro and makes it available for use.

Creating Macros Manually

To manually create a macro, choose the **New** push button in the Keyboard Macros dialog or choose **New Macro** from the **Macros** menu popup. The Macro Edit dialog appears.



Macro Edit Dialog

You must type in a defined key combination in the Defined Key text box. You can use any of the key combinations in the following list:

- F1-F10, Ins, Del, Home, End, PgUp, PgDn or the arrow keys
- Shift plus F1-F9, Ins, Del, Home, End, PgUp, PgDn or the arrow keys

- Ctrl plus A-I, K-Z, F1-F10, Home, End, PgUp, PgDn, Left Arrow or Right Arrow. Ctrl+Q and Ctrl+S are not recommended.
- Alt plus A-Z, F1-F10.
- Shift+Ctrl plus A-Z, F1-F10, Home, End, PgUp, PgDn, Left Arrow or Right Arrow. Shift+Ctrl+Q and Shift+Ctrl+S are not recommended.
- Shift+Alt, Ctrl+Alt or Shift+Ctrl+Alt plus A-Z or F1-F10.
- Alt+F10 plus A-Z.



Ctrl+Alt+Del and Shift+Ctrl+Alt+Del will reboot your computer!

When typing in a key combination that contains the Shift, Ctrl and/or Alt keys, always type the keys in the order shown in the list above.



Refer to the <key label> assignments listed under ON KEY LABEL in the FoxPro *Language Reference* for proper key name spellings.

You must use a plus sign (+) between key names. Do not type spaces between the key names and the plus sign. If you put a space before or after the plus sign, FoxPro will ignore anything following the space.

You do *not* need to be concerned with capitalization.

If you type invalid key names in the Defined Key text box, an error message appears when you choose **OK**.

Type a name for your macro in the Macro Name text box.

In the Macro Contents text area, type the keystrokes that you want the macro to execute. Use the <key label> assignments listed in ON KEY LABEL in the FoxPro *Language Reference* and enclose them in curly braces ({ }) to represent the desired keystrokes. (The <key label> is the letter or digit on the key itself or a special name assigned to the key.) Any key combination, such as Ctrl+F2, is also placed in curly braces.

For example, if you want to define the Shift+Ctrl+J key combination to bring the Command window forward and display the names of all the files in the current directory, you would:

1. Type `Shift+Ctrl+J` in the Defined Key text box.

2. Type a macro name in the Macro Name text box.

3. Type `{Ctrl+F2}DIR{ENTER}` in the Macro Contents area. Ctrl+F2, the key combination that brings the Command window forward, is placed in a single set of curly braces. Ctrl and F2 are the <key label> assignments. DIR is the command that displays the names of all the files in the current directory and {Enter} is the <key label> assignment in curly braces.

When you are satisfied with your macro, choose **OK** to confirm that you have completed the macro and to make it available for use. To exit the dialog without creating the macro, choose **Cancel**.

Inserting Pauses Manually

You can manually enter pauses in your macro. If you want your macro to pause until any key is pressed, type `{Pause Key}` at the appropriate place in the Macro Contents area. You can also specify the number of seconds you want your macro to pause. For example, if you want your macro to pause for three seconds, type `{Pause 3.0}` at the appropriate place in the Macro Contents area.

Because the Macro Contents area is an editing area, the **Undo/Redo**, **Cut/Copy/Paste**, **Clear** and **Select All** options are available to you if you want to make changes in your macro.

Inserting Carriage Returns Manually

You may press Enter to break lines in the Macro Contents area for ease of reading or editing and this will *not* be recorded in your macro. If you *do* want your macro to execute a carriage return, you must type `{ENTER}`.

Inserting Spaces Manually

If you press the Spacebar in the Macro Contents area, your macro will record the spaces you enter and will execute that spacing in your macro.

Inserting Semicolons Manually

To enter a semicolon in your macro, type `{Semicolon}`. Typing just `;` alone is equivalent to `{Enter}`.

Editing Existing Macros

Existing macros can be edited in much the same way as new macros are created manually. To edit an existing macro, select the macro from the list in the Keyboard Macros dialog and choose the **Edit** push button. You can also choose **Edit Macro** from the **Macros** menu popup or double-click on the macro in the list. The Macro Edit dialog appears.

Use standard text editing techniques to make any desired adjustments to your macro in the Defined Key and Macro Name text boxes and the Macro Contents text area.

When your changes are made, choose **OK** to confirm your modifications. To exit the dialog without making changes, choose **Cancel**.

You can assign new values to F1 through F10 by choosing **Macros...** from the **System** menu popup or with the SET FUNCTION command. Function keys beyond F10 are not supported in FoxPro.

Erasing Macros

Two push buttons in the Keyboard Macros dialog can be used to erase current macros: **Clear** and **Clear All**. **Clear** erases the macro that is selected in the list. **Clear All** erases all macros in the list. Both of these push buttons have corresponding options on the **Macros** menu popup. The difference between current and saved macros is discussed next.

If you don't want any macros to be loaded when you start FoxPro, choose **Clear All** in the Keyboard Macros dialog to erase all the macros from the list. Once the list is empty, choose **Set Default** to save an empty file as your DEFAULT.FKY file.

Saving Macros

Current vs. Saved Macros

It is important to understand the difference between current and saved macro sets. The current macro set exists temporarily in memory and appears in the list in the Keyboard Macros dialog.

Saved macro sets are stored on disk in files with the extension .FKY and don't appear in the Keyboard Macros dialog. When you restore a saved macro set, it is copied to memory and added to the current set. Modifications to the new current set do not affect its .FKY file.

For example, you could add a series of editing macros to the current macro set. These new macros vanish when you exit FoxPro unless you save the macro set by choosing **Save**, or overwrite the default macro set by choosing **Set Default**.

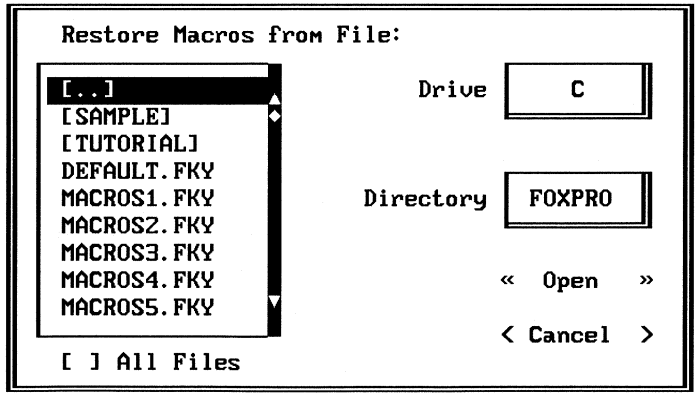
The **Clear** and **Clear All** push buttons and menu options only affect the current macros. **Clear All** is especially useful when you want to create an entirely new macro set. You can erase all the macros in the list and start from scratch without deleting the contents of any .FKY file.

Saving and Restoring Macro Sets

A macro set is a group of macros that have been created for the same application. When you define a set of macros you want to keep, choose **Save** in the Keyboard Macros dialog or choose **Save Macros** from the **Macros** menu popup. A Save As dialog appears.

This dialog contains a list of subdirectories and macro sets (designated with an .FKY extension) that exist in the current directory. You can type a new name for the macro set in the text box, or overwrite an existing file by choosing the file name from the list. When the desired name is in the text box, choose **Save**. The file is stored in the directory that is displayed on the **Directory** popup.

When the Keyboard Macros dialog is displayed, you can add a saved macro set to the current macros (those in the list). To add to the current macros, choose the **Restore** push button or choose **Restore Macros** from the **Macros** menu popup. A Restore Macros dialog appears.



Restore Macros Dialog

Select the file that contains the macro set you want to restore and choose **Open**.



The process of restoring macro sets is additive. When you **Restore** a file, its contents are added to the current macros list.

If your default macro file defines keys F2-F5 and you restore a file that defines keys F5-F7, you would end up with a list that contained macros for keys F2-F7. The second definition of F5 would replace the first. The original files are not altered in the process.

Default Macro File

A default macro set automatically loads whenever you start FoxPro. Each time you run FoxPro, it looks for a default macro file named DEFAULT.FKY. If a DEFAULT.FKY file is found, it is loaded. If no DEFAULT.FKY is found, FoxPro uses its own default macros (F2 through F9 and SHIFT_1 through SHIFT_9).

Creating a Default Macro File

You can create your own default file by saving a macro set in a file named DEFAULT.FKY or by choosing **Set Default** in the Keyboard Macros dialog with the desired macros loaded. FoxPro stores the DEFAULT.FKY file wherever it finds your FOXUSER resource file. If no FOXUSER file exists or if no resource file has been designated in your CONFIG.FP, FoxPro stores the DEFAULT.FKY file in the current directory.



The DEFAULT.FKY file must be in the default directory, the directory containing FOXPRO.EXE, for FoxPro to find and load it when you run FoxPro. If your FOXUSER file is in a different directory when you **Set Default**, the DEFAULT.FKY file will be created in that directory and not accessed by FoxPro.

Modifying Default Macro Sets

To change which macros are stored in the DEFAULT.FKY file, make sure DEFAULT.FKY is loaded and create or erase the desired macros (as described later in this section). When you are satisfied with the changes, choose **Set Default**.

A confirmation box appears. If you want to store the current macros as the startup default, choose **Yes**. The new macros will replace those that are stored in DEFAULT.FKY and will appear in the Keyboard Macros list at the start of each FoxPro session. You may change your startup defaults at any time. Choose **No** to return to the Keyboard Macros dialog without changing the default file.

Combining Macros

If you have a custom DEFAULT.FKY macro set and you want to combine it with FoxPro's default macros, follow these steps:

1. At the DOS prompt in the directory where DEFAULT.FKY is located, type: `RENAME DEFAULT.FKY TEMP.FKY`
2. Start FoxPro.
3. Choose **Macros...** from the **System** menu popup. (FoxPro's default macros appear in the Keyboard Macros list.)
4. Choose the **Restore** push button to display the Restore Macros dialog.
5. Choose TEMP.FKY from the list and choose **Open**. Now choose **Set Default** to save your custom macros and the new macros in a file named DEFAULT.FKY.

For more information about macros, see PLAY MACRO in the FoxPro *Language Reference.*

Filer

Copy files, create directories, move files and delete files

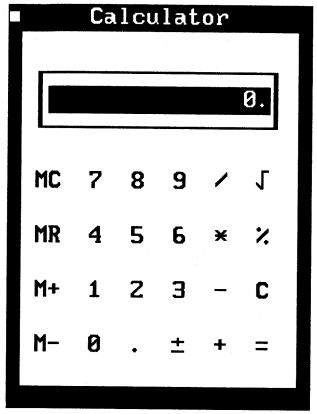
When you choose **Filer** from the **System** menu popup, the Filer window appears with the Files panel displayed. A **Filer** menu pad is added to the right end of the menu bar.

For information about the Filer, see the Filer Menu chapter in this manual.

Calculator

Perform calculations

When you choose **Calculator** from the **System** menu popup, a calculator appears on the screen. The FoxPro Calculator is used like a standard pocket calculator.



Calculations can be performed using the keyboard or the mouse.

With the keyboard, you can type the equation as it would be written. Most Calculator keys have the same keyboard equivalents, with the following exceptions:

Keystroke	Equivalent
Q	√
R	MR
N	±
A	M+
Z	MC
S	M-

To calculate 8 x 16 ÷ 2 and take the square root of the result using the keyboard:

Type `8*16/2=Q`

The result is 8.

To perform the same calculation with the mouse, simply click on the appropriate numbers and symbols on the Calculator.

Display Panel

The display panel of the Calculator is a text editing area. Numbers can be edited, cut, copied and pasted into other documents. You can also paste portions of other documents into the display panel, but only numerical values are displayed.

When numbers in the display panel are highlighted, they will be replaced by the next entry you make.

Keypad

The keypad is comprised of number, operator and memory keys. The number keys, **0-9**, and the decimal key (.) control the majority of the data you enter. The ± key toggles the displayed value between positive and negative.

While you perform calculations, the current operator appears to the right of the display panel. The operators **+**, **-**, ***** and **/** should be entered between the numbers you are calculating:

```
2 + 2 - 1 * 5 / 2
```

The square root (√) sign should be placed immediately after the number for which you want to find the square root:

64√

The percent operator (**%**) is used with the **+** and **-** operators. It allows you to add or subtract a percentage of a number:

100 + 10%

Press **=** to display a result. Press the **C** key once to erase the current value in the display panel. When you press **C** twice, the current calculated value and the operator that appears to the right of the display panel are erased.

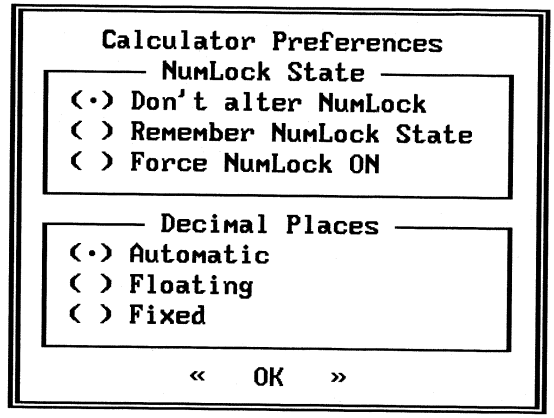
Memory allows you to store one number indefinitely. To store a number in memory, simply enter the number and click **M+**. The letter **M** will appear to the left of the display panel. Once a number has been stored, you can clear the screen and/or perform other calculations. When you want to recall the number, click **MR** and it will appear in the display panel (overwriting the current display).

It is possible to modify the number in memory without repeating the initial process. The **M+** and **M-** keys can be used to add or subtract from the current number. If, for example, you have the number 56 stored in memory and you want to decrease it by 12: enter the number 12, click **M-** and then click **MR**.

The number 44 will appear in the display panel and replace 56 in memory. Click **MC** when you want to clear the number from memory.

Calculator Preferences

If you choose **Preferences...** from the **Edit** menu popup while the Calculator is active, the Calculator Preferences dialog appears so you can specify settings that affect the Calculator each time you use it.



Calculator Preferences

The first group of radio buttons in the Calculator Preferences dialog allows you to change the status of NumLock for the Calculator. In all cases, when you exit the Calculator, NumLock returns to its original state.

Don't alter NumLock — Invokes the Calculator without affecting the state of NumLock.

Remember NumLock State — Causes the Calculator to remember and revert to the setting of NumLock the last time the Calculator was used.

Force NumLock ON Turns NumLock on when you activate the Calculator.

The second group of radio buttons in the Calculator Preferences dialog allows you to adjust the decimal display of numbers:

Automatic Displays calculated results based on the number of decimal places in the numbers you enter and the operation performed. **Automatic** is chosen by default.

Floating Displays numbers to the highest degree of precision. Numbers are shown with as many decimal places as necessary to display the entire number, with trailing zeros removed.

Fixed Displays a text box in the Calculator Preferences dialog. Type the number of decimal places you want to appear in all values, both entered and calculated. If a number has fewer decimal places than you specified, trailing zeros are added.

Other Features

If you attempt to execute an invalid calculation, an error message appears on the screen. For example, if you attempt to use a number that is too large for the display panel, the "Numeric Overflow" message appears and the display panel is cleared.

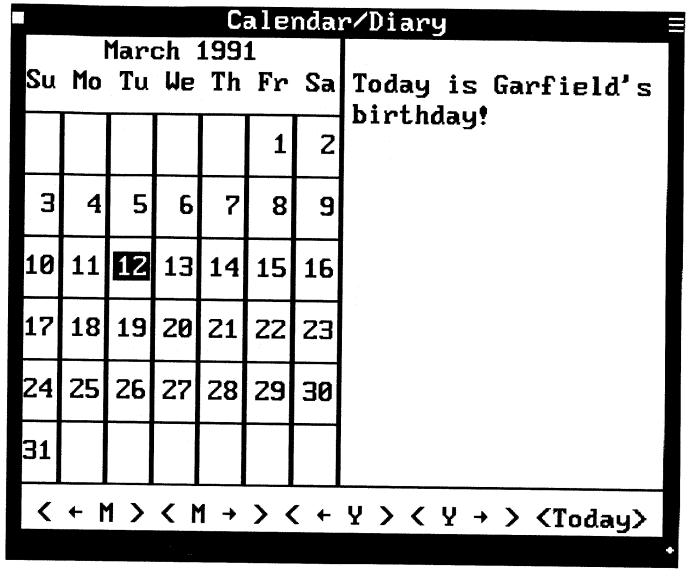
When you close the Calculator or exit FoxPro, the contents of memory, the numbers in the display panel and the preference settings for the Calculator are stored in the FOXUSER file. The next time you use the Calculator your data and settings will be intact.

You can keep the Calculator on the screen with any of the other FoxPro desk accessories.

Calendar/Diary

Check dates/keep track of appointments

When you choose **Calendar/Diary** from the **System** menu popup, a monthly calendar appears with the current day selected.



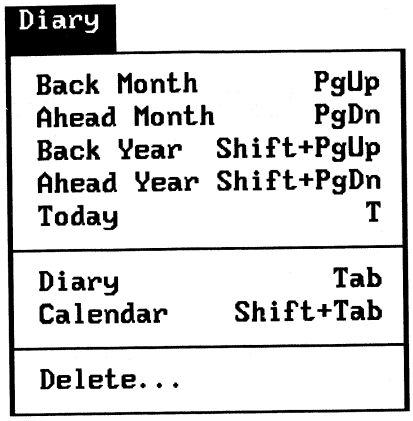
The FoxPro Calendar/Diary is used just like any other calendar — to check dates and keep track of appointments. The Calendar/Diary is a standard FoxPro window that can be scrolled, moved, sized and closed.

The first time you open the Calendar/Diary during a FoxPro session, the current day is selected. If you select a different day, close the Calendar/Diary and reopen it, the last selected day is still selected.

To the right of the Calendar panel is the Diary panel. You use the Diary panel to input text associated with any date on the Calendar panel. To activate the Diary panel, press the Tab key or choose **Diary** from the **Diary** menu popup. To activate the Calendar panel, press Shift+Tab or choose **Calendar** from the **Diary** menu popup.

At the bottom of the Calendar/Diary window are push buttons used to change the calendar. These buttons correspond to the first five options on the **Diary** menu popup.

The **Diary** menu popup has options that change the calendar, change the active panel and delete diary entries.



Diary Menu

Calendar Panel

The Calendar panel appears with the current month displayed and today's date selected. The month and year at the top of the calendar are highlighted when the Calendar panel is active.

To change the selected day, use the arrow keys or click on the desired day. To change the month backward or forward, use the PgUp and PgDn keys or the two month push buttons, ←**M** and **M**→, at the bottom of the window. To change the calendar backward and forward by year, use Shift+PgUp and Shift+PgDn or the year push buttons, ←**Y** and **Y**→, at the bottom of the window.

You can select today's date by pressing T on the keyboard or by choosing the **Today** push button. This is a quick way to get back to the current day.

The **Diary** menu popup contains options that correspond to all of these actions.

Diary Panel

You can have a diary entry for each day. To make a diary entry, select the day in the Calendar panel. Activate the Diary panel by pressing Tab or clicking on the panel with the mouse. The cursor flashes in the Diary panel, indicating that it is active.

The Diary panel is a text region so you can use standard text editing techniques. There is no limit to the amount of text you can

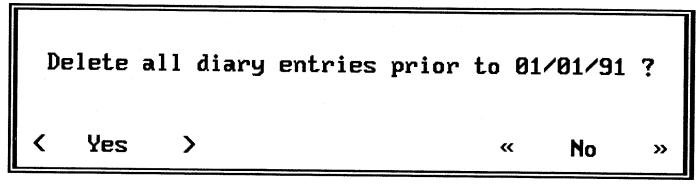
enter. You can zoom and size the Calendar/Diary to see more of the text in the Diary panel.

All dates that have a diary entry are displayed as enhanced text.

Delete Entries

Each diary entry is stored in the FOXUSER resource file until you delete it. This means that every time you use the Calendar/Diary, you can refer to these entries by selecting the day. Clear these entries out from time to time to keep from wasting disk space.

You delete diary entries from a selected date backward. When you select a day on the calendar and choose **Delete...** from the **Diary** menu popup, all text entries prior to but not including that day will be erased. An alert appears so you can confirm the action.



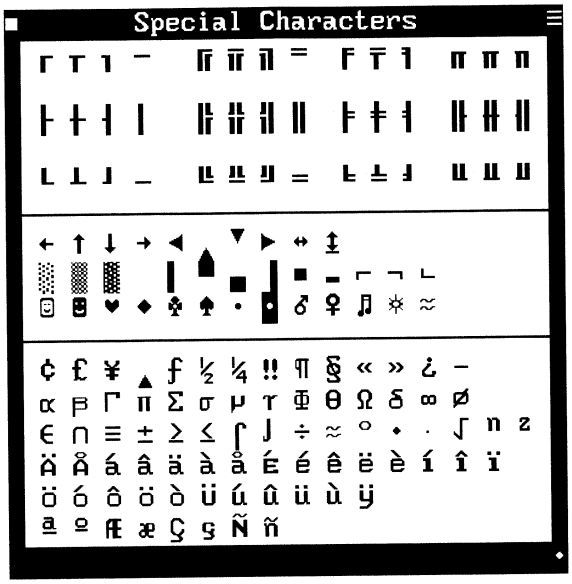
Choose **Yes** to delete the entries. **No** returns you to the Calendar/Diary without deleting any entries.

When you finish using the Calendar/Diary, close it by choosing **Close** from the **File** menu popup, pressing Escape or clicking the close box.

Special Characters

Access foreign punctuation, line drawing characters and symbols

When you choose **Special Characters** from the **System** menu popup, the Special Characters window appears.



Special Characters Window

You can select characters such as foreign punctuation marks, line drawing characters and symbols from the Special Characters window and paste them into any editing window. For special characters to appear in a window, the window must be open and be a window in which you can normally use the **Paste** option.

To place a special character in a window, position the cursor in the window where you want the special character to appear.

If you are using the keyboard, press Ctrl+F1 to bring the Special Characters window frontmost. Use the arrow keys to select the special character you want and press Enter or the Spacebar. The character appears in the editing window.

If you are using a mouse, click on the Special Characters window to bring it frontmost. Point to the special character you want and double-click. The character appears in the editing window.



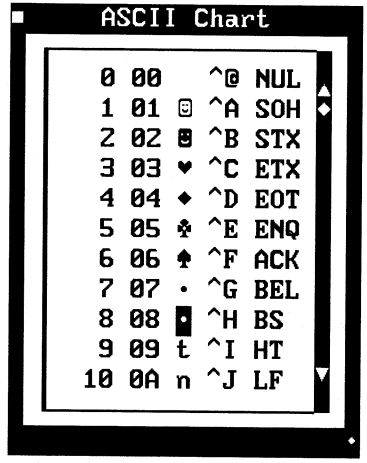
If you have trouble getting the desired character to appear in the window, try holding down the Shift key when you choose the special character.

To close the Special Characters desk accessory, choose **Close** from the **File** menu popup, click the close box or press the Escape key.

ASCII Chart

List ASCII characters

When you choose **ASCII Chart** from the **System** menu popup, a window appears with a list containing an ASCII chart.



ASCII Chart

From left to right, the columns show the ASCII characters in:

1. Decimal representation
2. Hexadecimal representation
3. Graphic representation
4. Control key representation
5. Abbreviated meaning

Scroll to the entry you wish to reference. If you know the decimal equivalent of the ASCII character, you can type the number to go directly to the specific entry.

When you choose an ASCII character, its graphic representation is pasted at the cursor position in the last window that was active. For the ASCII character to appear, the window must be open and be a window in which you can normally use the **Paste** option.



If you have trouble getting the desired character to appear, try holding down the Shift key when you choose the ASCII character.

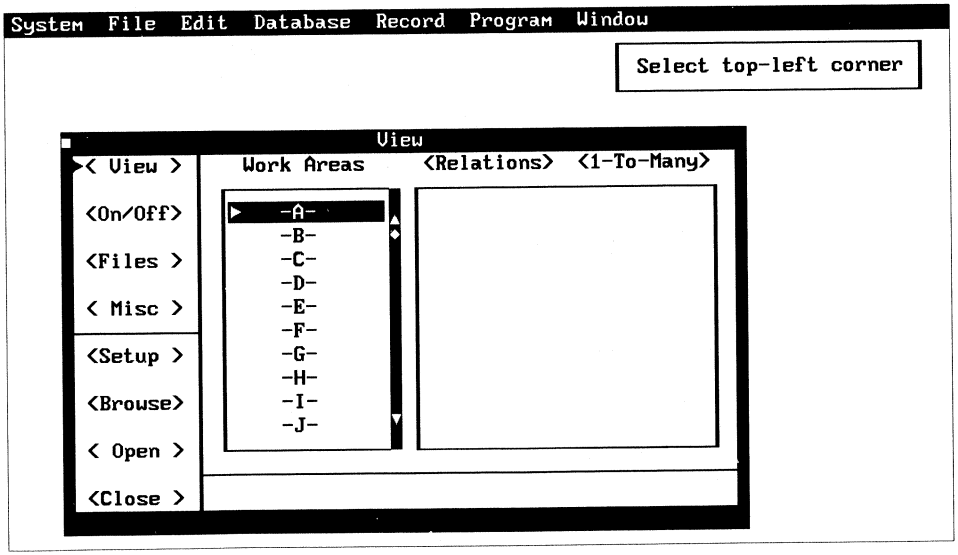
To close the ASCII Chart, choose **Close** from the **File** menu popup, click the close box or press the Escape key.

Capture

Make copies of screen text

The Capture desk accessory copies selected text to the clipboard so that it is available to paste into any window. You can copy any *text* displayed on the screen, even if it isn't in a window. You can even capture output from a program. Graphic characters, such as the borders of windows, cannot be captured.

With text on the screen, choose **Capture** from the **System** menu popup. A message appears to tell you to select the top left corner.



Capturing the View Window

As soon as you start to select the corner, the message disappears so you can see the entire screen. Select the text area from the upper left corner to the lower right corner.

To select text with the keyboard, use the cursor movement keys to place the cursor at the starting point of the selection. Press Enter to begin the selection. A message appears to tell you to select the bottom right corner.

Move the cursor to the end of the selection. Press Enter to capture the selected text.

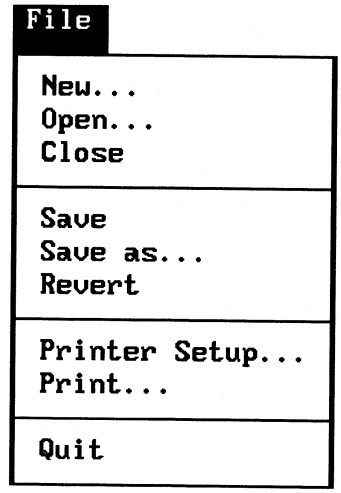
To select text with the mouse, move the pointer to the starting point of the selection. Press the mouse button to start selecting. A message appears to tell you to select the bottom right corner.

Drag the cursor to the end of the selection. The selected text is captured when you release the mouse button.

"Captured and placed on clipboard" appears when the capture is completed. Press Escape during the capture if you decide not to capture text.

3 File Menu

The **File** menu contains options that allow you to create, open, save and otherwise manipulate the files on your disks. You can also enter printer information and exit FoxPro through this menu.

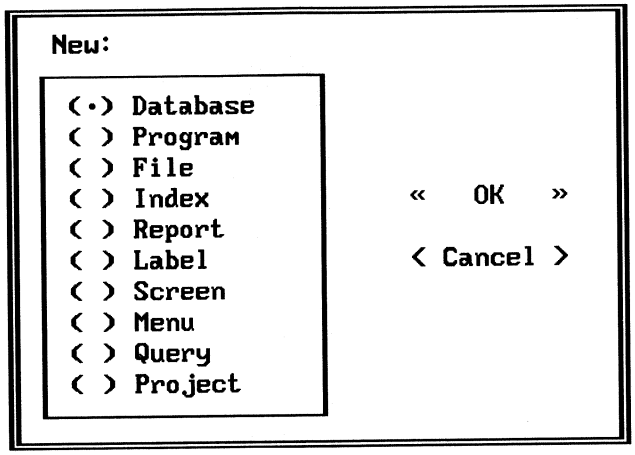


File Menu

New...

Create a new file

New... lets you create and open a new file. When you choose this option, the New File dialog appears.



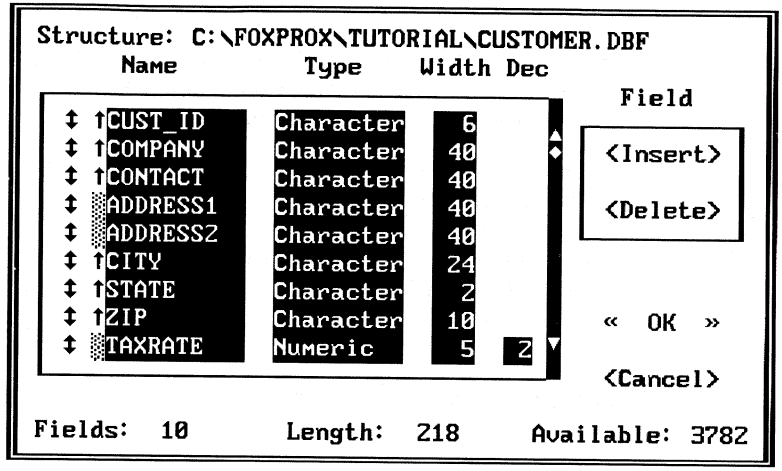
New File Dialog

If no database is open in the selected work area, you can create any type of file except an index file. If a database *is* open in the current work area, you can create any one of the file types: database, program, text, index, report, label, screen, menu, query or project. Choose the radio button for the type of file you want to create, then choose **OK**.

You can cancel the creation of any file by choosing **Cancel** or pressing Escape.

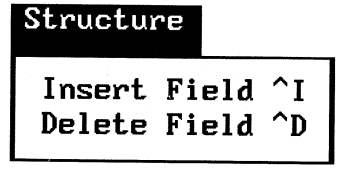
Creating a Database File

To create a database, choose the **Database** radio button in the New File dialog and choose **OK**. An empty Structure dialog appears. The illustration below shows an example of how the Structure dialog appears after you add field information.



Structure Dialog

When the Structure dialog is displayed, a **Structure** menu pad is added to the menu bar. The **Structure** menu popup is provided specifically for keyboard users. Keyboard users will need to use options or Control key shortcuts from this popup instead of the **Insert** and **Delete** push buttons in the dialog.



Structure Menu

Defining Database Fields

In the Structure dialog, you define the fields that will be in your database. For each field:

1. Enter a field name (up to 10 characters) in the text box below the Name heading.
2. Press Tab or Enter to move to the Type field, then press the Spacebar and choose a type from the **Type** popup. With the mouse, click on the Type field and choose a type. Finally, enter Width and Decimal values for the new field.



Every database has one extra byte that FoxPro uses to keep track of deleted records. This means that the total field width for a database is always one greater than you define. For example, in the Structure dialog a new database with *no* fields has a width of one.

Specify a data type by choosing an option from the **Type** popup:

Character Enter a field width (up to a maximum of 254). The default width is 10.

Numeric Enter a field width up to 20, including an optional plus/minus sign and decimal place. The default width for numeric data is 8.

Date A width of 8 is automatically assigned.

Logical A width of 1 is automatically assigned.

Memo A width of 10 characters is automatically assigned. This corresponds to the amount of space used in the database. The actual size of memo fields, depends on the amount of data entered into them. Memo fields are limited only by available memory.

Float Enter a field width up to 20 including an optional plus/minus sign and decimal place. The default width for float data is 8. This field is specifically designed for scientific data.

Picture Pictures cannot be added or manipulated in FoxPro for MS-DOS®. Databases that contain pictures are created in FoxBASE+® for the Macintosh® and imported to the PC.

Inserting and Deleting Database Fields

In the Structure dialog, you can insert and delete fields in your database as described below:

Insert To insert a new field, position the cursor in an existing field and choose the **Insert** push button or **Insert Field** from the **Structure** menu popup. A field named NEWFIELD with a Character type and a default width of 10 is added before the selected field. To insert more fields, choose **Insert** again. Fields will be added and named NEWFIELD1, NEWFIELD2, and so on.

To change the attributes of the new field, select its default name and type the desired name. Press Tab or Enter to move to the Type field, then press the Spacebar and choose a type from the **Type** popup. With the mouse, click on the Type field and choose a type. Finally, enter Width and Decimal values for the new field.

Delete Removes the selected field from your database structure. To delete a field, select it and choose the **Delete** push button or choose **Delete Field** from the **Structure** menu popup. The selected field is removed and all remaining fields shift up one position in the structure.

Moving Database Fields

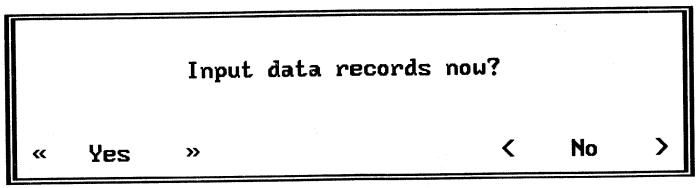
If you finish defining fields and decide that they're in the wrong order, it is easy to move them in the Structure dialog.

To change the order of fields in the database using the keyboard, press Tab until the desired field is selected, then hold down the Ctrl key and press the Up/Down Arrow keys to drag the field to its new location.

To change the order of fields in the database using the mouse, point to the double-headed arrow that precedes the field you want to move and drag the field to a new location.

When you finish creating the new database structure, choose **OK** to save it. A Save As dialog appears so you can specify the directory where the new file will be stored and name the file. Type a name in the text box and choose **Save**.

FoxPro asks:



No returns you to the interactive command mode. **Yes** adds a new record to the database so you can begin to input data.

Adding and Removing Structural Compound Index Tags

In the Structure dialog, you can add and remove index entries or *tags* for structural compound indexes. (Compound indexes are described later in this chapter.)

After you add field information to the Structure dialog, a shaded area appears to the left of each field name.

Adding a Structural Compound Index Tag

To add a tag to a structural compound index:

1. Position the cursor in the shaded area directly preceding the field. The field will be your index expression. The field name will be your tag name.
2. Depending on the type of tag you want, do *one* of the following:
   - For an index in ascending order, press the Spacebar once or double-click with the mouse. An up arrow appears.
   - For an index in descending order, press the Spacebar twice or triple-click with the mouse. A down arrow appears.

Removing a Structural Compound Index Tag

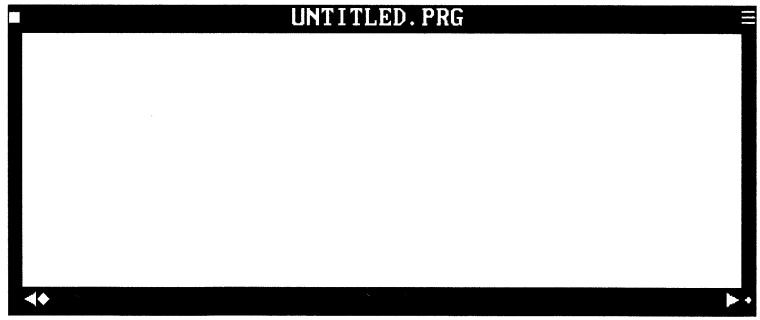
To remove a tag from a structural compound index:

1. Position the cursor on the up or down arrow in the shaded area directly preceding the field.
2. Depending on the type of tag you're removing, do *one* of the following:
   - To remove an index in ascending order, press the Spacebar twice or triple-click with the mouse.
   - To remove an index in descending order, press the Spacebar once or double-click with the mouse.

Choose **OK** to confirm your changes or **Cancel** to exit the dialog without making changes.

Creating a Program File

In the New File dialog, choose the **Program** radio button and choose **OK** to display an empty program editing window.



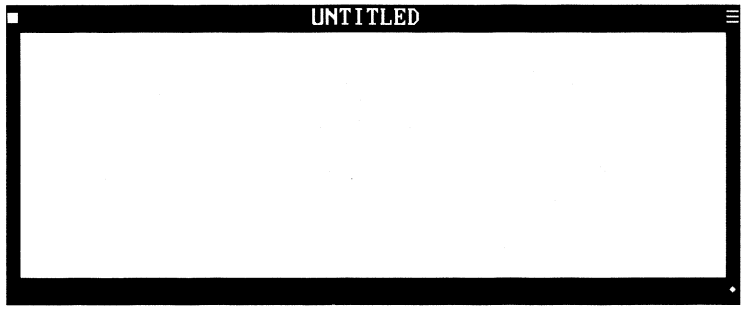
Program Editing Window

Enter your program in this window using FoxPro text editing techniques. The text editor is described in the chapter titled Interface Basics.

When you finish, save the file and close the window. An extension of .PRG is automatically assigned by FoxPro unless you specify a different extension.

Creating a Text File

In the New File dialog, choose the **File** radio button and choose **OK** to display an empty text editing window. You can create any kind of text file in this window. Just type the text.

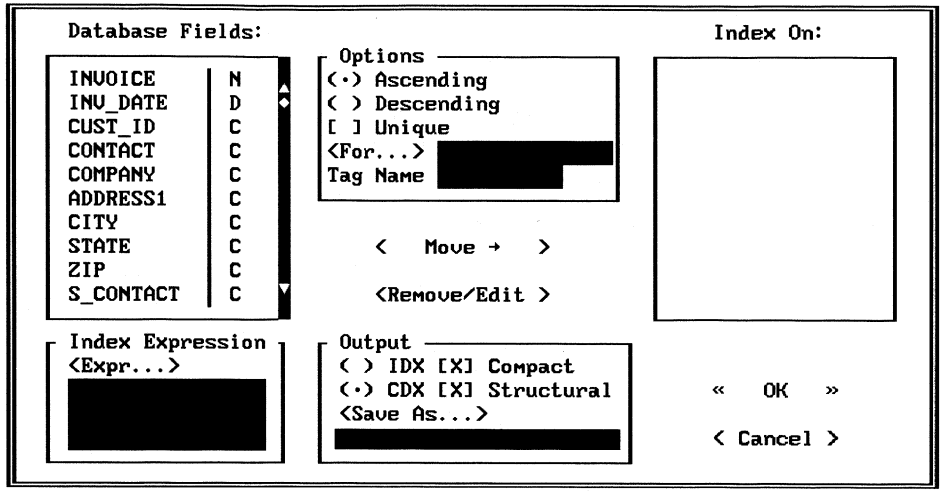


Text Editing Window

When you're finished, save the file and close the window. The text file will not have an extension unless you specify one.

Creating Compound and Single Entry Index Files

In the New File dialog, the **Index** radio button is disabled unless a database is open. To create an index file, choose the **Index** radio button and choose **OK**. An Index dialog appears so you can create compound or single entry index files.



Index Dialog

Compound Index Files

A compound index file is an index file that contains any number of separate index entries or *tags*. Because the number of tags in a compound index file is limited only by disk space, you can have as many tags in the file as disk space permits. All indexes in a compound index file are available when the file is opened.

Two types of compound index files may be created: *structural* and *independent*.

Creating a Structural Compound Index

A *structural* compound index file is automatically opened and updated with the database and assigned the same name as the database. Any index entries that need to be kept current should be included in the structural compound index.

To create a structural compound index:

1. Choose the **CDX** radio button in the Output area at the bottom of the Index dialog.

   Ascending and **Descending** are now enabled so you can specify whether the fields in your database will be indexed in ascending or descending order.

2. Check the **Structural** check box in the Output area.

   When you check the **Structural** check box, the name of the open database is automatically entered in the text box below the **Save As...** push button.

3. Then, do *one* of the following:

   - Choose a field from the **Database Fields** list so that it appears in the **Index On** list. The index will be given a tag name that corresponds to the field you've chosen. The tag name appears in the Tag Name text box.
   - Type the index expression in the text box below the **Expr...** push button. Type a tag name for the index entry in the Tag Name text box. Choose the **Move** push button to copy the expression into the **Index On** list.
   - Choose the **Expr...** push button and use the Expression Builder to create an index expression. Type a tag name in the Tag Name text box. Choose the **Move** push button to copy the expression into the **Index On** list.

4. If you want to include a For clause in your index expression, do *one* of the following:

   - Type the clause in the text box next to the **For...** push button.
   - Choose the **For...** push button and create the For clause in the Expression Builder.

5. If you don't want records with duplicate index expression values to be included in the index file, check the **Unique** check box when the index expression is tagged (selected so a triangle appears next to it) in the **Index On** list. A ! appears next to the index expression. Only the first record encountered with the specified value will be included in the index file.

6. When you're satisfied with the expression in the **Index On** list, choose **OK.**

Creating an Independent Compound Index

An *independent* compound index file *never* has the same name as the database and will not automatically open with a database. It must be explicitly opened for a database.

To create an independent compound index:

1. Choose the **CDX** radio button in the Output area at the bottom of the Index dialog.
2. Uncheck the **Structural** check box.
3. Then, do *one* of the following:
   - Choose a field from the **Database Fields** list so that it appears in the **Index On** list.
   - Type the index expression in the text box below the **Expr...** push button. Type a tag name for the index entry in the Tag Name text box. Choose the **Move** push button to copy the expression into the **Index On** list.
   - Choose the **Expr...** push button and use the Expression Builder to create an index expression. Type a tag name for the index entry in the Tag Name text box. Choose the **Move** push button to copy the expression into the **Index On** list.
4. If you want to include a For clause in your index expression, do *one* of the following:
   - Type the clause in the text box next to the **For...** push button.
   - Choose the **For...** push button and create the For clause in the Expression Builder.
5. If you don't want records with duplicate index expression values to be included in the index file, check the **Unique** check box when the index expression is tagged in the **Index On** list. A ! appears next to the index expression. Only the first record encountered with the specified value will be included in the index file.
6. When you're satisfied with the expression in the **Index On** list, type a name for your new file in the text box below the **Save As...** push button or choose the **Save As...** push button to display the Save As dialog. In the Save As dialog, you can specify the directory where the new file will be stored and name the file. Type a name in the text box and choose **OK**.

7. Choose the **OK** push button in the Index dialog.

Compact Single Entry Index Files

The single entry index file is limited to one index entry. This index file must be explicitly opened and active to be updated with a database. The number of single entry index files you can have open per database file is limited by file handles.

You can make a single entry index file *compact* so that it is smaller, faster and requires less disk space. Compact single entry index files are useful if you're using the index for only a limited time and you're going to delete the file when you're finished using it.

To create a compact single entry index:

1. Choose the **IDX** radio button in the Output area at the bottom of the Index dialog.
2. Check the **Compact** check box.
3. Then, do *one* of the following:
   - Choose a field from the **Database Fields** list so that it appears in the **Index On** list.
   - Type the index expression in the text box below the **Expr...** push button and choose the **Move** push button to copy the expression into the **Index On** list.
   - Choose the **Expr...** push button and use the Expression Builder to create an index expression. Then choose the **Move** push button to copy the expression into the **Index On** list.
4. If you want to include a For clause in your index expression, do *one* of the following:
   - Type the clause in the text box next to the **For...** push button.
   - Choose the **For...** push button and create the For clause in the Expression Builder.
5. If you don't want records with duplicate index expression values to be included in the index file, check the **Unique** check box when the index expression is tagged in the **Index On** list. A ! appears next to the index expression. Only the first record encountered with the specified value will be included in the index file.

6. When you're satisfied with the expression in the **Index On** list, type a name for your new file in the text box below the **Save As...** push button or choose the **Save As...** push button to display the Save As dialog. In the Save As dialog, you can specify the directory where the new file will be stored and name the file. Type a name in the text box and choose **OK**.

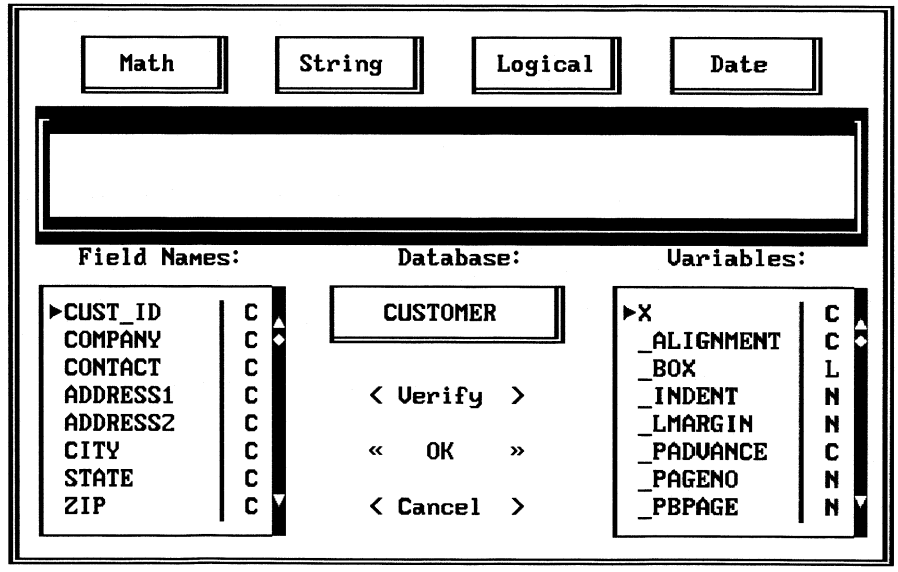
7. Choose the **OK** push button in the Index dialog.



Non-compact single entry index files should be created *only* if you need to maintain compatibility with older versions of FoxPro (prior to FoxPro 2.0) or if you're sharing data with FoxBASE+ and FoxBASE+ for the Macintosh.

Expression Builder

The Expression Builder is a dialog that appears in FoxPro whenever you need an expression to complete a command.



Expression Builder Dialog

An expression is an item (or items) that, when evaluated, generates a new value of Character, Numeric, Logical or Date type. An expression can be as simple as a single variable or number, or it can be very complex. In general, you form expressions with an appropriate combination of the following elements:

- Database field names
- Memory variables
- Constants (or literals)
- Functions and operators

Expressions are often used to create indexes, relate databases or specify a For or While clause.

Creating an Expression

To create an expression in the expression box, type in or choose the field names, variables, operators and functions you need to build the expression. The Expression Builder contains several controls to help you create the expression. These controls are described in the following sections.

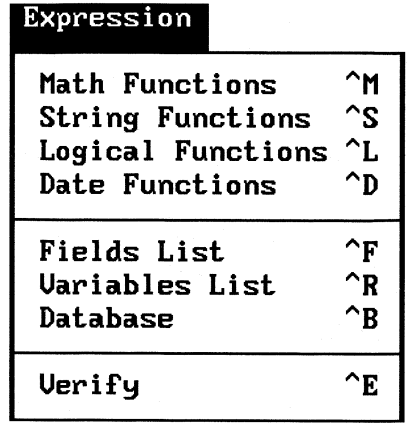
Once your expression is complete, choose **Verify** to make sure that the expression is valid. If all is well, an "Expression is valid" message appears on the screen. Move the mouse or press Shift or Ctrl to erase the message.

If there are any problems with the expression, an error message appears. To erase the error message, click the mouse button or press any key except for function keys, Ctrl, Shift and Alt.

When you've finished building the expression, choose **OK** to confirm it.

Expression Menu Popup

When the Expression Builder dialog appears, an **Expression** menu pad is added to the menu bar. The **Expression** menu popup is available for users who want or need to choose menu options or use control key shortcuts to maneuver in the dialog.



Expression Menu

The **Expression** menu popup contains the following options:

- The **Math Functions**, **String Functions**, **Logical Functions** and **Date Functions** options display the associated popup in the Expression Builder dialog.
- The **Fields List**, **Variables List** and **Database** options select the appropriate list or popup in the Expression Builder dialog.
- The **Verify** option displays a message telling whether or not your expression is valid. Move the mouse or press Shift or Ctrl to erase the message.

Function/Operator Popups

At the top of the Expression Builder are four popups: **Math**, **String**, **Logical** and **Date**. These popups contain the functions and operators that you can use to build expressions with each type of data.

Brief definitions of each function and operator appear on the popups. Each popup is scrollable.

When you choose a function or an operator from a popup, it appears in the expression box.

Functions and operators can be edited in the expression box as necessary. Be sure to select the expression box before you try to edit in it.

Expression Line and Expression Box

Below the four function/operator popups is the expression line and below that is the expression box. The expression line reminds you what your expression will be used for, and the expression box displays your expression *as you build it*.

When you want to type or edit directly in the expression box, make sure you select the box first by clicking in it with the mouse or Tabbing to it.

Any time that you wish to erase the contents of the expression box, use FoxPro text editing techniques.

Field Names and Variables

The **Field Names** list displays the fields in the active database. You can tell which database is active because its name appears on the **Database** popup control.

Similarly, the **Variables** list displays the available memory variables that you can choose and add to your expression.

Field names and variables can be moved into the expression box by double-clicking on the field name or variable with the mouse. With the keyboard, press Tab until an item in the appropriate list is highlighted. Press the Up and Down Arrow keys to select the desired field name or variable, then press Enter. The field name or variable appears in the expression box.

Database Popup

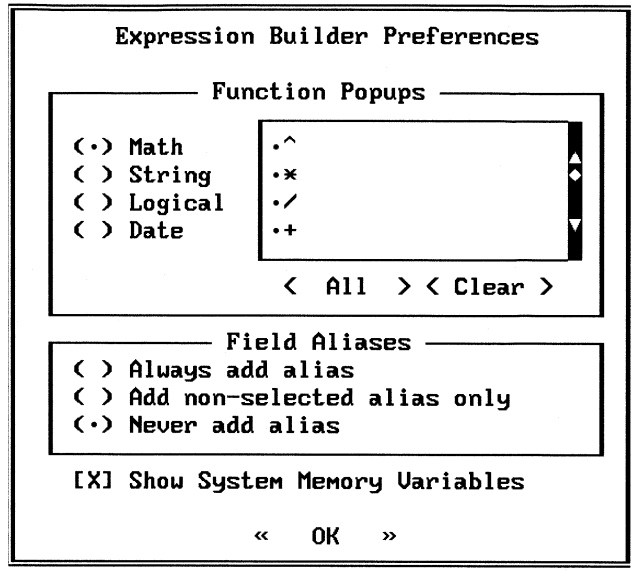
The name of the active database appears on the **Database** popup control. The **Database** popup lists all database files open in work areas.

To use fields from a different database in your expression, choose another database from the **Database** popup. The **Field Names** list displays the fields in the newly selected database.

When only one database is open, the **Database** popup is disabled.

Expression Builder Preferences Dialog

Choosing **Preferences...** from the **Edit** menu popup when the Expression Builder dialog is displayed brings forward the Expression Builder Preferences dialog.



Expression Builder Preferences Dialog

With this dialog you can:

- Change the options that will appear on the **Math**, **String**, **Logical** and **Date** popups
- Specify whether field aliases will be displayed in your expressions and how you want them displayed
- Specify whether or not to display system memory variables in the Expression Builder

Four radio buttons and a list of popup options are located in the Function Popups area at the top of the dialog.

To adjust the options that will appear on the **Math**, **String**, **Logical** and **Date** popups, choose the radio button for the popup that you wish to change. The list on the right contains the options that can appear on the popup. A bullet next to an option indicates that it will appear on the popup.

Choosing the **All** push button places a bullet next to every option so that all the options will appear on the popup.

Choosing the **Clear** push button removes the bullets next to all the options in the list and removes them from the popup.

To add or remove individual options from the popup:

1. Select the option in the list.
2. Then, do *one* of the following:
   - Press the Enter key.
   - Press the Spacebar twice.
   - Point to the option with the mouse and double-click.

The radio buttons in the Field Aliases portion of the dialog determine how field aliases are displayed.

Always add alias	The database name is included with fields used in the expression.
Add non-selected alias only	When more than one database is open, FoxPro includes the name of the database that is *not* selected in the work area of the View window with any of its fields in the expression.
Never add alias	Database names are not included with any field when creating the expression.

Unchecking the **Show System Memory Variables** check box removes system memory variables from the Expression Builder.

The preferences you specify are saved in your FOXUSER file.

Creating a Report Form File

When you choose the **Report** radio button in the New File dialog, you invoke the FoxPro Report Writer. With the Report Writer, you can design custom report forms to meet your needs.

The Report Writer is described in the Report Writer chapter of this manual. For information on printing a report, see Report in the Database Menu chapter.

Creating a Label File

When you choose the **Label** radio button in the New File dialog, a Label Layout window appears. For information about labels, refer to the Label Designer chapter in this manual.

Creating a Screen File

Choose the **Screen** radio button in the New File dialog to display a Screen Design window. For information about screens, refer to the Screen Builder chapter in this manual.

Creating a Menu File

When you choose the **Menu** radio button in the New File dialog, a Menu Design window appears. For information about menus, refer to the Menu Builder chapter in this manual.

Creating a Query

Choose the **Query** radio button in the New File dialog to display the RQBE (Relational Query By Example) window. For information about RQBE, refer to the chapter titled Relational Query By Example (RQBE) in this manual.

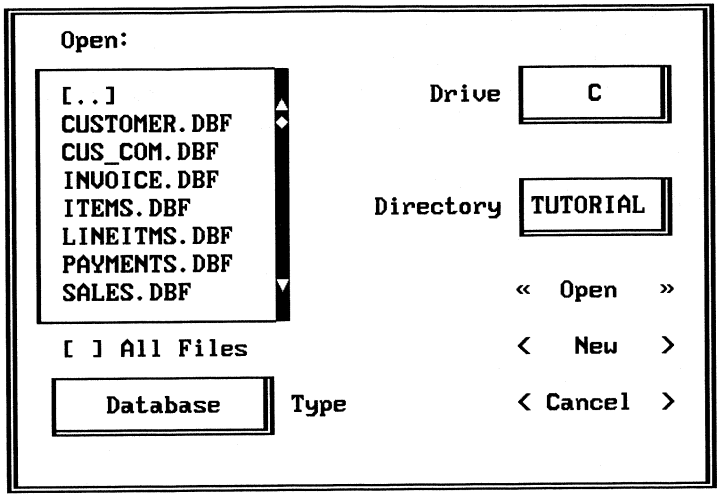
Creating a Project File

Choose the **Project** radio button in the New File dialog to display a Project window. For more information, see the chapter titled Project Manager in this manual.

Open...

Open an existing file

Open... allows you to open existing files. When you choose this option, the Open File dialog appears.



Open File Dialog

The Open File dialog displays all the files of a particular type. File types are categorized by their extensions.

If you want to display *all files* in a directory, regardless of type (extension), check the **All Files** check box. Now you can open any file that contains valid data for the file type displayed on the **Type** popup, even if it doesn't have the default extension.

The first time that this dialog appears during a session, it displays the items from the default directory. If you change drives and/or directories, any time the dialog appears again it will display the same items as when you last closed it. To return to the default directory, you must choose that directory from the popup.

The list in the Open File dialog displays the symbol for parent directory ([..]), followed by the names of subdirectories of the current directory (contained in brackets). Below these are the names of all files that correspond to the specified type (extension), displayed in alphabetical order. If a file is already open, that file name is disabled in the list.

Changing Drive and Directory

You can change directories one at a time by choosing the parent directory ([..]) from the list. Each time you choose the parent directory you move one directory closer to the root directory. The **Directory** popup displays the name of the current directory and the list changes to reflect the subdirectories and files in the new directory.

The **Directory** popup contains the names of all the parent directories up to the root directory. You can move up the directory structure quickly by choosing the desired directory from this popup.

You can change drives using the **Drive** popup. This popup displays all the available drives. When you change drives, the associated root directory appears on the **Directory** popup control and the list displays the subdirectories and files in the new root. When the current directory is the root, no symbol for parent directory ([..]) appears in the list.

Specifying File Type

The **Type** popup at the bottom of the dialog displays all the file types you can open. This popup scrolls so you can see all the file types. File types that cannot be opened are disabled.

If the current work area does not contain an open database, you can open any file type except an index file. If a database *is* open in the current work area, you can open every file type.

Before you open a file, make sure that the appropriate file type appears on the **Type** popup control.

When you display **Report**, **Label** or **Screen** on the **Type** popup in the Open File dialog, a **Restore Environment** check box appears at the bottom of the dialog.

The **Restore Environment** check box is checked by default. This means that when a report, label or screen file is opened, all environment settings saved with the file, including databases and indexes in use, relations and set skip to settings, are restored.

If you wish to open a report, label or screen *without* opening an associated environment, uncheck the check box.

Specifying a File To Open

To open a file, select it from the list and choose **Open**. To leave the dialog without opening a file, choose **Cancel**.

When you open different types of files, different actions occur. The action associated with each file is described next.

Database Opens a database in the current work area and generates USE <filename> in the Command window. If a database is already open in the selected work area, it is closed before the newly selected file is opened.

Program Displays a program file in a text editing window and generates MODIFY COMMAND <filename> in the Command window. Text editing is described in the Interface Basics chapter.

View Restores any environment settings, including database, index, alternate and format files, alias names and established relations from the View window and generates SET VIEW TO <filename> in the Command window.

File Displays a text file in a text editing window and generates MODIFY FILE <filename> in the Command window. Text editing is described in the Interface Basics chapter.

Index Opens a single entry index file or an independent compound index file in the current work area and generates SET INDEX TO <filename> in the Command window. An open single entry or independent compound index file is represented in the View window by a bullet that precedes the work area alias. If another single entry or independent compound index file is open in the current work area, it is closed before the new index is opened.

To open more than one single entry or independent compound index file for the chosen database, choose **Setup...** from the **Database** menu popup or choose the **Setup** push button in the View window. Setup is described in the Database Menu chapter.

All index tags in a structural compound index file are available when the database is opened.

Index is enabled only if a database is open in the current work area.

Report Invokes the FoxPro Report Writer. Your report file appears in a Report Layout window. In addition to FoxPro .FRX files, reports from other applications are available to you in the Open File dialog. These files have an .FRM extension. If you try to open a file that has an .FRM and an .FRX version, the .FRX file will be opened unless you adjust your configuration file. Refer to the Report Writer chapter of this manual for more information.

Label Displays a label file in the Label Layout window. In addition to FoxPro .LBX files, labels from other applications are available to you in the Open File dialog. These files have an .LBL extension. If you try to open a file that has an .LBL and an .LBX version, the .LBX file will be opened unless you adjust your configuration file. Refer to the Label Designer chapter for more information.

Screen Displays a screen file in the Screen Design window and generates MODIFY SCREEN <filename> in the Command window. You can open many screen files at the same time. Refer to the Screen Builder chapter in this manual for more information.

Menu Displays a menu file in the Menu Design window and generates MODIFY MENU <filename> in the Command window. Refer to the Menu Builder chapter in this manual for more information.

Query Displays the RQBE window for an existing query and generates MODIFY QUERY <query_name> in the Command window. You can open more than one RQBE window at a time. Refer to the chapter titled Relational Query By Example (RQBE) for more information.

Project Opens an existing Project window. Multiple Project windows can be opened at the same time. Refer to the Project Manager chapter in this manual for more information.

Close

Close the active window

Close closes the active window. Mouse users can also close a window by clicking on the close box in the upper left corner of the the window.

Save

Save the active file

Save stores any changes you've made to the active text, program, report, label, screen, menu, query or project file without closing the file. If more than one editing window is active, only changes to the frontmost editing window are saved to disk.

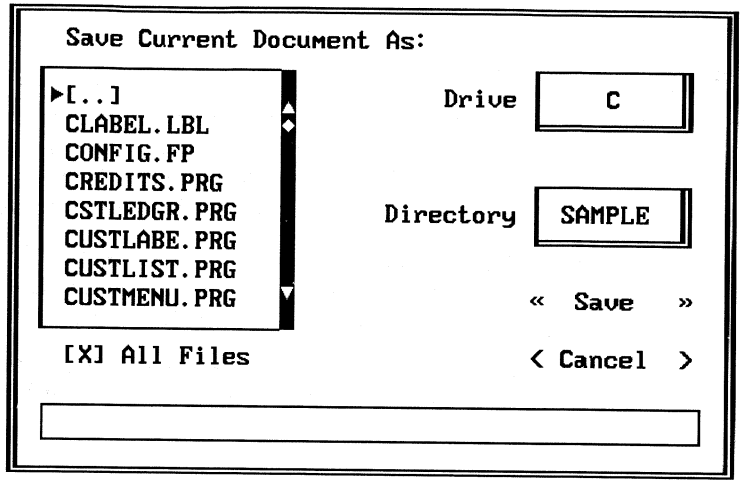
If you choose **Save** when a file has not yet been saved or named, the Save As dialog appears.

Save is disabled when no changes have been made since you last saved, or when a window other that an editing window is frontmost (for example, Browse, Command).

Save as...

Save the active file under a different name

Save as... allows you to name and save a newly created file, or save a copy of an existing file under a different name. Choose **Save as...** to display the Save As dialog.



Save As Dialog

If the file has already been named, the current name of the file appears in the text box. Otherwise, the text box is empty.

Select the text box, then type a name for the file and choose **Save.**

- If this is the first time you have saved the file, it is stored on disk and the file name appears as the window title.
- If you are saving a copy of an existing file, a new text editing window appears with the new file name as the window title. The old file is closed. If recent changes to the old file were not saved before you created the new file, the changes do not appear in the old file but do appear in the new file.

When you name and save files, text files are not automatically assigned a .TXT extension. If you want a text file to have an extension, you must type the extension in the text box when you name the file. Program files are automatically assigned a .PRG extension.

You can save the current environment settings to a view file. If you choose **Save as...** when the View window is frontmost, a Save As dialog appears so you can enter a name for the new .VUE file.

This .VUE file contains all the environment settings including names of files in use, alias names, relations that have been established, and so on.

When in the Save As dialog, you may decide not to create a new file. Choose **Cancel** to resume editing the current file.

Revert

Return to the last saved version of a file

Revert is enabled when you've made changes to a text file, program file, report file, label file, screen file, menu file, query file, project file or memo field since the file was last saved.

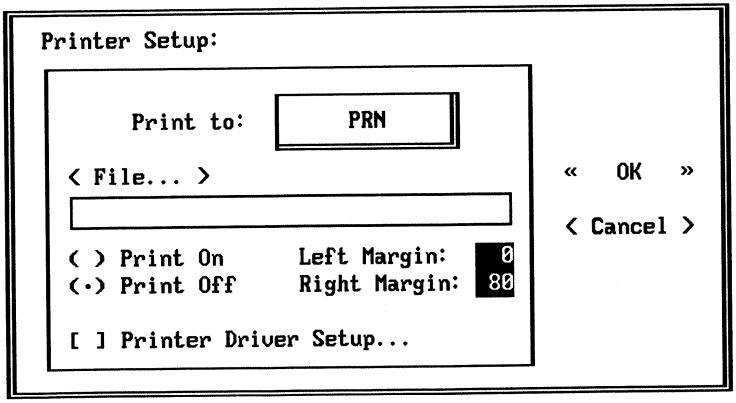
Choose **Revert** to replace the currently displayed file or memo field with the previous version. Before replacing the current version, FoxPro asks if you want to discard the changes.

Choose **No** to return to the current version or **Yes** to discard your changes and replace your current document with the previous version.

Printer Setup...

Specify printer settings

Printer Setup... displays the Printer Setup dialog.



Printer Setup Dialog

In this dialog, you can choose a print device from the **Print to** popup. If you choose **File** from the popup, you should specify a file to which output will be sent. To do this, type a file name in the text box or choose the **File...** push button and enter a file name in the Print To dialog.

Adjust the settings for left margin and right margin, if necessary. These values are assigned to the _LMARGIN and _RMARGIN system memory variables and affect all output from the Print dialog. If **Wrap words** is checked in the Preferences dialog, output from ?, ?? and the TYPE command is also affected.

Choose the **Print On** or **Print Off** radio button to enable or disable output to the printer.

When your settings are correct, choose **OK** to activate them or choose **Cancel** to exit the dialog without changing the current print settings.

Printer Setup Dialog

The FoxPro Report Writer and Label Designer let you specify the style of text that is output to your printer. For example, text in reports or labels can be in bold face, italicized, underlined, subscript or superscript.

For text to appear in different styles in printed output, you must specify a printer driver for your printer. A printer driver is an interface between FoxPro and your printer. FoxPro provides a set of printer drivers, and complete support for creating your own user-defined printer drivers.

If your printer is supported by a printer driver included with FoxPro, you can interactively specify a printer driver for your printer. In addition to specifying a printer driver, you can create different setups for your printer. For example, you can create individual printer setups for particular page orientations, font sizes and styles and so on.

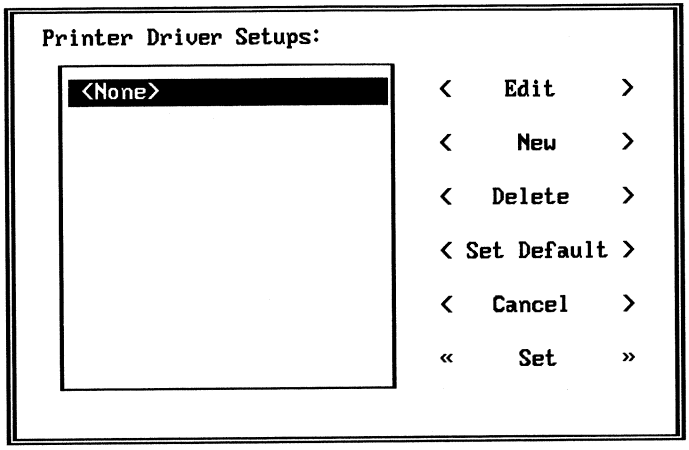
If your printer isn't supported by the printer drivers included with FoxPro you can modify the existing printer drivers or create your own.

Specifying a Printer Driver

To specify a printer driver, first choose the **Printer Setup...** option from the **File** menu popup. The Printer Setup dialog appears.

Now choose the **Printer Driver Setup...** check box in the Printer Setup dialog. The Printer Driver Setup dialog appears.

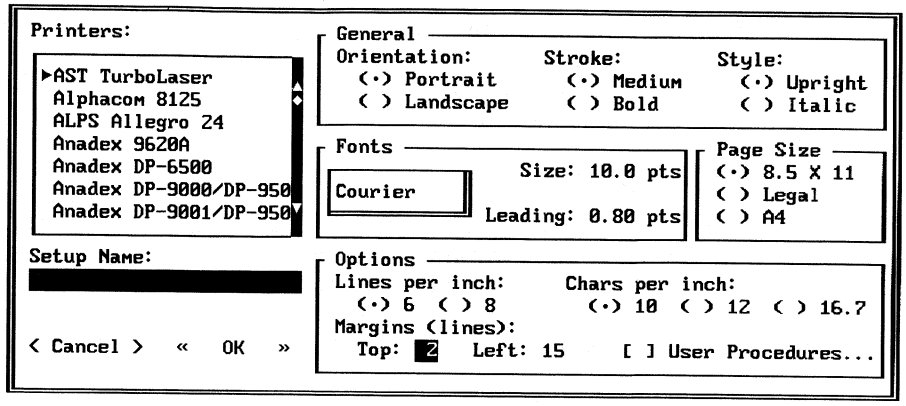
From this dialog, you can create a printer driver setup, modify an existing setup, delete a setup, specify a default setup, load a setup and clear the current setup.



Printer Driver Setup Dialog

Creating a New Printer Driver Setup

Choose the **New** push button in the Printer Driver Setup dialog to display the Printer Setup Editing dialog.



Printer Setup Editing Dialog

To create a new printer driver setup, choose a printer from the **Printers** list. Adjust any print parameters (page orientation, page size, font styles, etc.) if desired.

If you specify the Postscript printer driver, you can:

- Specify a default font (Times, Helvetica, Courier etc.) and font size in points (1 point ≈ 1/72 inch) for reports and labels and output from DISPLAY, LIST and TYPE.
- Specify the leading (space between lines) in points.
- Specify the top and left margins in points for reports.

If you use a printer driver other than Postscript, you can:

- Specify the number of lines per vertical inch (6 or 8).
- Specify the number of characters per horizontal inch (10, 12 or 16.7).

Once you have specified your print parameters, save the setup. To save the setup, type a name for the setup in the Setup Name text box and choose the **OK** push button. The message "Setup Saved" is displayed. Printer driver setups are stored in your FoxPro resource file.

The printer driver setup you defined now appears in the Printer Driver Setup dialog. To load this setup for your printer, choose the **Set** push button.

Modifying an Existing Printer Setup

To modify an existing printer setup, choose the name of the printer setup to modify from the **Printer Driver Setups** list in the Printer Driver Setup dialog, then choose the **Edit** push button. The Setup Editing dialog appears.

Deleting a Printer Setup

To delete a printer setup, choose the name of the printer setup to delete from the **Printer Driver Setups** list in the Printer Driver Setup dialog, then choose the **Delete** push button.

Specifying a Default Printer Setup

A default printer setup can be automatically loaded when FoxPro is started. To specify a default printer setup, choose the name of the printer setup from the **Printer Driver Setups** list in the Printer Driver Setup dialog, then choose the **Set Default** push button. The system message "Default was set" is displayed.

You can also specify a default startup setup in your FoxPro configuration file, CONFIG.FP. Include the line

```
PDSETUP = '<setup name>'
```

in your CONFIG.FP file, where <setup name> is the name of the setup you want to load when FoxPro is started. Be sure to enclose the setup name in quotation marks. The default printer driver setup specified in your CONFIG.FP takes precedence over a default printer driver setup specified in the Printer Driver Setup dialog.

Loading a Printer Driver Setup

To load a printer setup, choose the name of the printer setup to load from the **Printer Driver Setups** list in the Printer Driver Setup dialog, then choose the **Set** push button.

A printer driver setup can also be loaded programmatically with the SET PDSETUP command, or by storing the name of the setup to the _PDSETUP system memory variable. For more information, refer to the Printer Driver chapter of the FoxPro *Developer's Guide.*

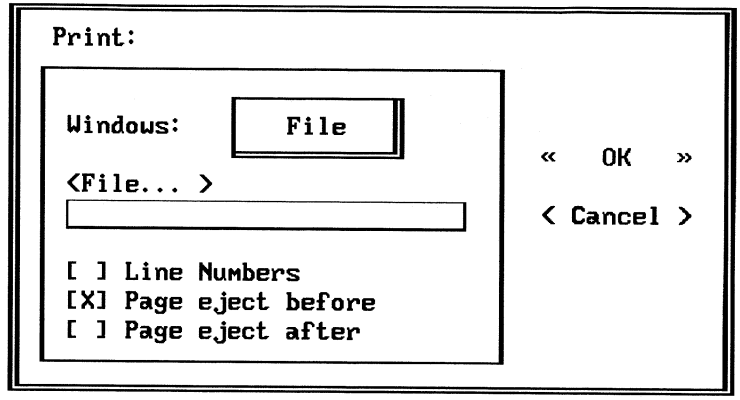
Clearing the Current Printer Setup

To clear the currently loaded printer driver setup, choose the **<None>** option in **Printer Driver Setups** list in the Printer Driver Setup dialog, then choose the **Set** push button.

Print...

Print the active file

Print... displays the Print dialog.



Print Dialog

In this dialog, you can specify one of the following print sources:

- The contents of the clipboard
- The contents of the Command window
- The contents of any open editing window
- The contents of a file that is not currently open
- The contents of an ASCII file

> The **Print...** option allows you to print *only* the sources listed above. To print a report or labels, choose **Report...** and **Label...**, respectively, from the **Database** menu popup. In the dialogs that appear, select the desired printing options.

Choose the source from the **Windows** popup. To print the contents of a file that is not currently open, choose the **File** option from the **Windows** popup. Then, in the text box, type the name of the file you want to print (including a full path if the file is in a different directory), or choose **File...** and choose the file you want to print from the list in the Open File dialog.

If you choose to print the contents of an open editing window, the settings of the following options in the Preferences dialog will affect the output: Left justify, Right justify, Center justify and Tab size.

When **Line Numbers** is checked, FoxPro automatically adds line numbers to the output.

When the **Page eject before** check box is checked, FoxPro sends a form feed to the printer before printing. When the **Page eject after** check box is checked, FoxPro sends a form feed to the printer after printing.

Once the settings in the Print dialog are correct, choose **OK** to confirm your choices or **Cancel** to exit the dialog without taking action.

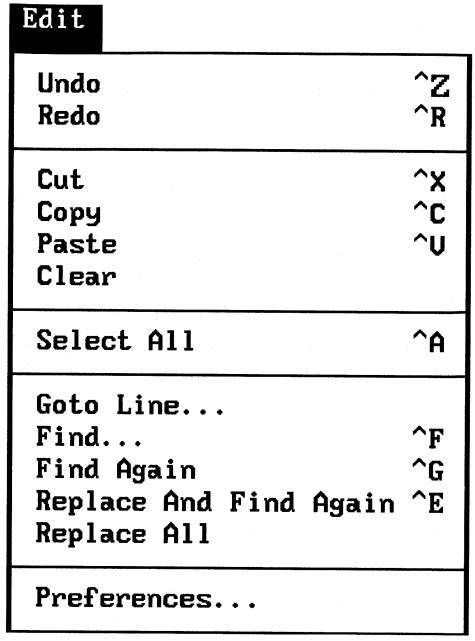
Quit

Exit FoxPro and return to system prompt

Quit ends your FoxPro session and returns you to the system prompt. The same actions occur when you type QUIT in the Command window.

4 Edit Menu

Edit menu options are useful when editing text in FoxPro.



Edit Menu

In addition to using **Edit** menu options in windows, some **Edit** menu options are available for use in text editing regions and text boxes of dialogs.

Undo

Reverse your last text editing command

Undo reverses the last action that was performed on any text within a field, record or file, and in text editing regions and text boxes of dialogs. If you choose **Undo** repeatedly, actions will be reversed all the way back to the start of the current editing session.

In the context of **Undo** and **Redo**, an action is defined as:

- Pressing Delete or Backspace
- Selecting then pressing Delete or Backspace
- Selecting then starting to type replacement text
- Moving the cursor and typing
- Any sequence of keystrokes besides those listed above that you make before pressing the Spacebar and typing
- Choosing one of the following **Edit** menu options: **Cut**, **Paste**, **Clear** or **Replace All**

Undo reverses actions in order from the most recent action performed back to the least recent (the first action performed in the editing session). If you **Undo** an action and then change your mind, you cannot restore the text to its previous form by choosing **Undo** again. To reverse an **Undo**, choose **Redo** from the **Edit** menu popup.

In a Browse window, **Undo** is available on a field-by-field basis. If you are editing a field in Browse and change your mind, choose **Undo** to display the field's original contents. Once you move the cursor to a new field using the mouse or the keyboard, **Undo** is disabled until you make changes in the new field.

If you choose **Undo** to reverse the action of the **Replace All** option, all the changes made during the replace are removed. **Replace All** is treated as one action.

When **Undo** has reversed all the actions performed in the current session, it is disabled. This means that when you save a file or close a file and reopen it, the **Undo** option is disabled until you make additional changes.

Redo

Redo the action previously reversed using Undo

Redo is the opposite of **Undo**. If you change your mind after you **Undo** an action, choose **Redo** to restore the text to its previous condition.

If you **Undo** several actions in a row, choosing **Redo** repeatedly will redo the actions in the reverse order that they were undone. The definition of an action for **Redo** is identical to the definition for **Undo**.

Cut

Place selected text on the clipboard

Cut removes selected text from any field, record, file, or from text editing regions and text boxes of dialogs. The text is placed on the clipboard.

Use **Cut** when you want to remove a piece of text from one location and place it in a different location using **Paste**. For more information on **Cut**, refer to the Text Editor section of the chapter titled Interface Basics.

Copy

Copy selected text to the clipboard

Copy duplicates the selected text (without removing it) and places the copy on the clipboard.

For more information on **Copy**, refer to the Text Editor section of the chapter titled Interface Basics.

Paste

Place text from clipboard

Paste inserts a copy of the clipboard contents into the current file or field at the cursor location. If text is selected and you choose **Paste** from the **Edit** menu popup, the contents of the clipboard replace the selected text. For more information on **Paste**, refer to the Text Editor section of the chapter titled Interface Basics.

Clear

Delete selected text

Clear permanently removes selected text or data without placing it on the clipboard. If you choose this option when text is selected, it is the same as pressing Delete or Backspace.

Clear also erases the active FoxPro output window. If you use **Clear** this way, text or data does not have to be selected.

Select All

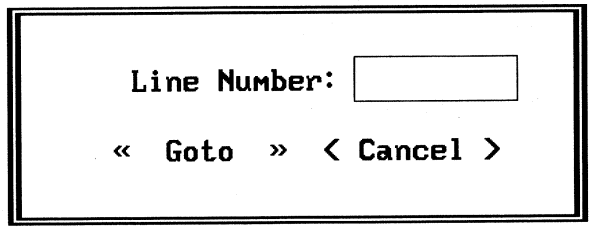
Select all lines of text

Select All selects all lines of text in the current editing window, design window, layout window, dialog text editing region or dialog text box. If you choose **Select All** when you are in a Browse window, all the text in the current field is selected for editing.

Goto Line...

Move cursor to designated line number

Goto Line... displays the Goto Line dialog so you can move the cursor to a designated line in a text, program or memo editing window, or in the Command window. For text, program and memo editing windows, this option is available only when **Wrap words** is not checked in the Preferences dialog.



Goto Line Dialog

In the Line Number text box, type the number of the line where you want the cursor to appear.

When you choose **Goto**, the cursor moves to the beginning of the line you specify, and the text of that line is displayed in the window. If the line number you specify is greater than the number of lines in the window, the cursor is positioned on the last line.

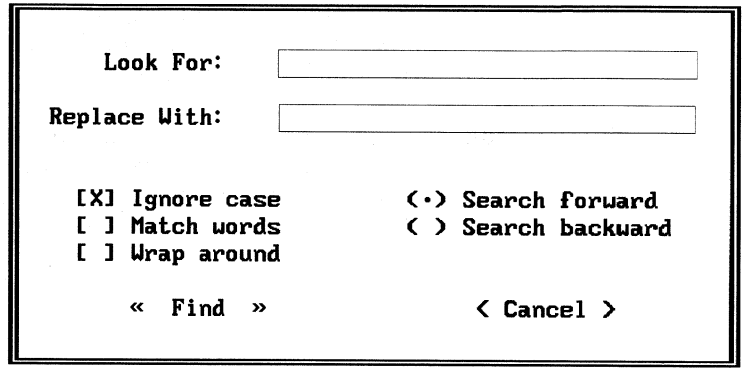
Entering a negative number also positions the cursor on the last line in the window.

The number you enter last in the Line Number text box is "remembered" until you exit FoxPro.

Find...

Search for text

Find... displays the Find dialog.



Find Dialog

The Find dialog lets you specify a word or phrase that you want to Look For and optionally lets you specify Replace With text. You don't have to specify Replace With text if you just want to locate text. If you do specify Replace With text, you don't have to use it for every occurrence you find.

Type the text you wish to locate in the Look For text box and type the text (if any) that will replace the located text in the Replace With text box.

In the Find dialog you can specify the following options:

Search forward Searches the file from the current file position to the end of the file. This is the default setting.

Search backward Searches the file from the current file position backwards, toward the beginning of the file.

Ignore case Locates the word with any combination of upper- and lower-case letters. If you use **Ignore case** with the phrase "Find the Text", FoxPro locates all case combinations, including: "find the text", "Find the Text" and "FIND THE TEXT". If you don't check this check box, FoxPro only locates occurrences of "Find the Text".

Match words Locates occurrences of the exact letter combination as specified in the text box. For example, if you told FoxPro to search for "can" and did not check **Match words**, it would find any phrases that contain "can", such as "candle", "decanter" and "incandescent". If you choose **Match words**, only exact occurrences of the word "can" are found.

Wrap around Searches the file from the cursor location to the end of the file, then wraps around to the beginning of the file and searches to the original cursor position. **Wrap around** allows you to search the entire file without first positioning the cursor at the beginning of the file.

When you have entered the appropriate information in the Find dialog, choose **Find** to begin the search or **Cancel** to exit the dialog without taking action.

> To search for Enter, Tab, Backslash and new line (line feed) characters, use the following C language representations when you type them in the text boxes in the Find dialog:
>
> **\r** – to search for an Enter.
> **\t** – to search for a Tab.
> **** – to search for a backslash.
> **\n** – to search for a new line (line feed).

When FoxPro finds a match, it highlights the matching text for you to see. You can edit the text using FoxPro editing techniques.

Find... can also be used to search for text in the Browse window. No Replace With text box appears in the Find dialog when you use it in the Browse window. To find and replace text in Browse, choose **Replace** from the **Record** menu popup. Refer to Replace in the Record Menu chapter for more information.

The Filer can be used to tag all files that contain specified text strings. For more information about the Filer, refer to the Filer Menu chapter of this manual.

Find Again

Repeat the last text search

After FoxPro locates the text string you specified in the Find dialog, you can choose **Find Again** to locate the next occurrence of the string.

When FoxPro finds the last match in the text, a "Not found" message appears to let you know that the search is complete.

Find Again is enabled only after you enter text in the Look For text box of the Find dialog and choose **Find**.

Replace and Find Again

Replace text and continue search

Replace and Find Again replaces a matching string of Look For text with the Replace With text that you specified in the Find dialog, then continues to search for the next occurrence of matching text. **Replace and Find Again** is enabled only after the first Find is executed. When FoxPro finds the next match, it pauses again to await instructions. If you don't want to replace this specific match, choose **Find Again** instead of **Replace and Find Again**.

Replace All

Replace all occurrences of the specified text

Replace All replaces every occurrence of a matching string of Look For text with the Replace With text that you specified in the Find dialog. It does not pause and ask about replacing the text each time it encounters a match. This option is enabled only after you choose **Find...** from the **Edit** menu popup.

When FoxPro has found the last match in the text, a "Not found" message appears to let you know that the search is complete.

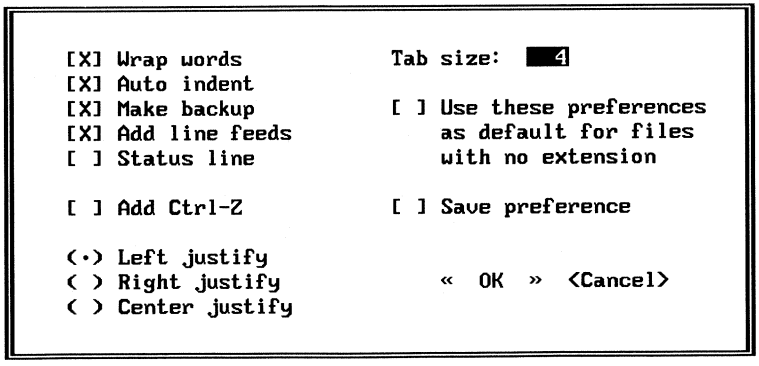
Preferences...

Establish edit settings

When a text, program or memo editing window is active, you can choose **Preferences...** to display the Preferences dialog so you can adjust the preferences that are in effect during editing sessions. **Preferences** is also enabled when the Expression Builder or the Calculator is frontmost.

Editing Preferences

Different preferences are used for text, program and memo editing windows. The active editing window determines the file type to which your preferences will apply. For example, if a program editing window is active and you choose **Preferences...** from the **Edit** menu popup, any adjustments you make apply to program files.



Preferences Dialog

Wrap words Automatically wraps text in the current window to the next line when it reaches the right margin, instead of letting it continue, beyond the right margin. Text that extends beyond the right margin can be accessed by scrolling the window.

Auto indent Automatically indents a line by the same amount as the previous line. This allows you to easily construct indented program structures.



When **Wrap words** and **Auto indent** are both checked, FoxPro automatically indents wrapped text in each paragraph by the same amount as the first line of the paragraph. For example:

- When a paragraph begins with a Tab, any wrapped lines are aligned with the Tab.
- When a paragraph begins with a number (or other text) followed by a Tab and text, any wrapped lines are aligned with the Tab.
- When the first line of a paragraph is indented using the Spacebar, any wrapped lines are indented by the same amount as the first line.

Make backup Stores the previous version of an edited file or program as a backup. Every time you save a file, the previous version is stored as the backup (in a .BAK file).

Add line feeds Saves files using a carriage return and line feed at the end of all lines. When this option is not checked, files are saved without line feeds and carriage returns so that they can also be exported to other computers.

Status line Adds a status line at the top of the editing area. When this check box is checked, a bullet appears in the upper left corner of the editing area if the text has been modified since it was last saved. The cursor's line and column positions are displayed. (Line position of the cursor is displayed only when **Wrap words** is not checked.) The active edit modes are also displayed: Insert mode (Ins), Overwrite mode (Over), Numlock mode (Num) and Capslock mode (Caps).

Compile when saved This preference is available only for program files and instructs FoxPro to compile the file after it is saved. If this is not checked, the program will not be compiled until it is executed.

Add Ctrl-Z When this check box is checked, FoxPro places a Ctrl-Z at the end of the file when the file is saved to mark the logical end of the file. FoxPro stops reading or writing a file when it encounters a Ctrl-Z, even if the Ctrl-Z has a meaning other than end-of-file.

If you don't check the **Add Ctrl-Z** check box, files will be read and written in their entirety even if they contain a Ctrl-Z character. The Ctrl-Z character will be read or written into the file.

Left justify Aligns all text at the left edge of the editing window.

Right justify Aligns all text at the right edge of the editing window.

Center justify Centers each line of text in the window. When you check this check box, pressing Enter positions the cursor in the center of the next line of the editing window.

Tab size Sets the distance (in number of spaces) that the cursor will advance when you press the Tab key. The default is four, but it can be set to any value between zero and 50.

Use these preferences Designates that all settings should be used as defaults for new text, program or memo files.

Save preference Stores the preference settings in the resource file so that each time you open the file, it appears as you left it at the end of the last editing session. This option also stores the window size, position and the cursor location.

Expression Builder Preferences

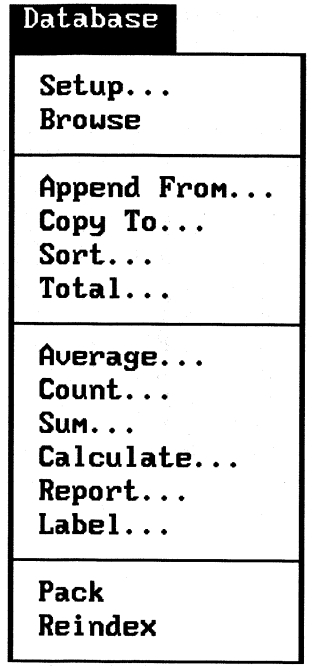
Choosing **Preferences...** when the Expression Builder dialog is displayed will bring forward the Expression Builder Preferences dialog. Refer to the Expression Builder section in the File Menu chapter for a description of this dialog.

Calculator Preferences

If you choose **Preferences...** when the Calculator is active, the Calculator Preferences dialog appears. Refer to Calculator in the System Menu chapter for more information.

5 Database Menu

Database menu options act on entire databases.

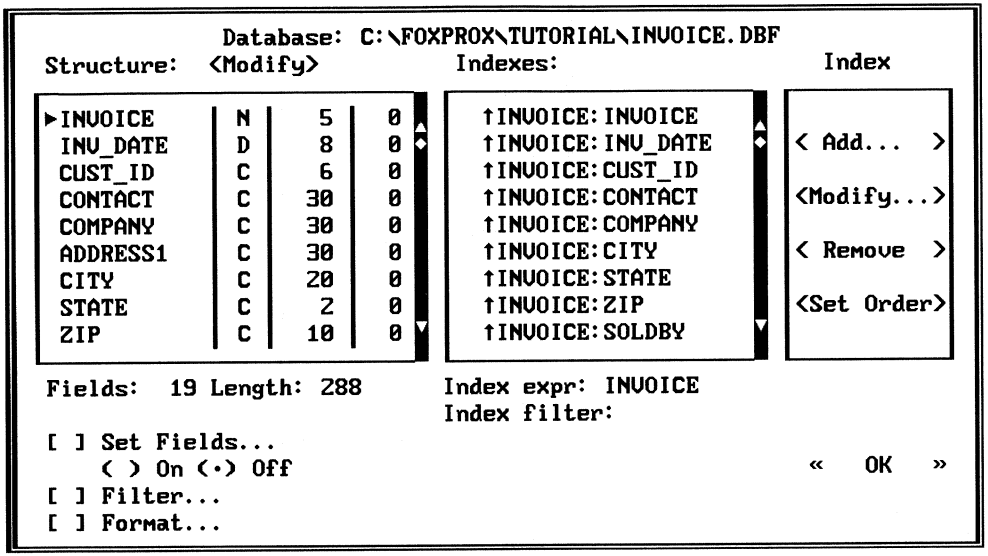


Database Menu

Setup...

Set up the current work area

Setup... allows you to set up the current work area. This option acts the same as the **Setup** push button in the View window. Choose the **Setup...** option or the **Setup** push button to display the Setup dialog. If no database is open in the current work area, you are prompted to open one. Once a database is open, the Setup dialog appears.



Setup Dialog

In the Setup dialog, you can decide which index file(s) to use with a database, select a list of fields to display in the Browse window, define a filter, and specify a format file to use for data input. When you finish setting up a work area, choose **OK**.

Using Indexes

Four push buttons are located at the right side of the Setup dialog: **Add...**, **Modify...**, **Remove** and **Set Order/No Order**. These push buttons allow you to open indexes, create indexes, modify index expressions, set the order of database records and close index files.

Opening an Existing Index

To open an existing index in the Setup dialog, choose **Add...**. The Open File dialog appears so you can select the desired index file. The Setup dialog reappears with the index name in the **Indexes** list.

Structural compound index files do not have to be explicitly opened in this manner. These index files are automatically opened when the associated database is opened. For more information about these indexes, see the Compound Index Files section in this chapter.

All open index files appear in the **Indexes** list. The index with a bullet next to it determines the database order.

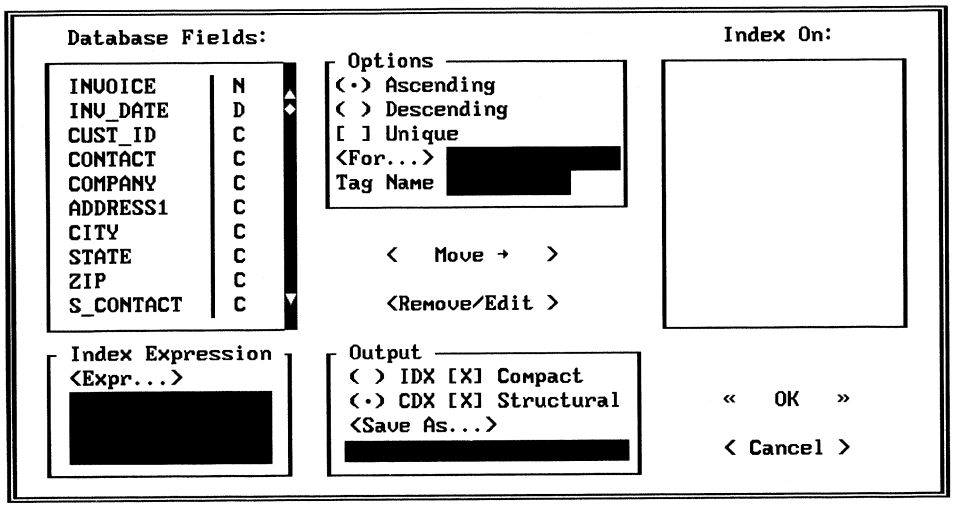
To see the expression and filter for an index, select the index name in the **Indexes** list. The index expression and filter appear below the **Indexes** list.

Closing an Index

Those indexes that appear in the **Indexes** list of the Setup dialog are open. To close an index, select its name from the **Indexes** list, and then choose the **Remove** push button. The index is removed from the **Indexes** list.

Creating a New Index

An appropriate index may not exist for you to use with a database. To create a new index in the Setup dialog, choose **Add...**. The Open File dialog appears. Choose **New**. The Index dialog appears.



Index Dialog

FoxPro lets you create two categories of index files:

- Compound index files (.CDX default extension)
- Single entry index files (.IDX default extension)

Compound Index Files

A compound index file is an index file that contains any number of separate index entries or *tags*. Because the number of tags in a compound index file is limited only by disk space, you can have as many tags in the file as disk space permits. All indexes in a compound index file are available when the file is opened.

Two types of compound index files can be created: *structural* and *independent*.

Creating a Structural Compound Index

A *structural* compound index file is automatically opened and updated with the database and assigned the same name as the database. Any index entries that need to be kept current should be included in the structural compound index.

To create a structural compound index:

1. Choose the **CDX** radio button in the Output area at the bottom of the Index dialog.

   Ascending and **Descending** radio buttons allow you to select whether the fields in your database will be indexed in ascending or descending order.

2. Check the **Structural** check box in the Output area.

   When you check the **Structural** check box, the name of the open database is automatically entered in the text box below the **Save As...** push button.

3. Then, do *one* of the following:

   - Choose a field from the **Database Fields** list so that it appears in the **Index On** list. The index will be given a tag name that corresponds to the field you've chosen. The tag name appears in the Tag Name text box in the Options portion of the dialog.
   - Type the index expression in the text box below the **Expr...** push button. Type a tag name for the index entry in the Tag Name text box. Choose the **Move** push button to copy the expression to the **Index On** list.
   - Choose the **Expr...** push button and use the Expression Builder to create an index expression. Type a tag name in the Tag Name text box. Choose the **Move** push button to copy the expression to the **Index On** list.

4. If you want a For clause in your index expression, do *one* of the following:

   - Type the clause in the text box next to the **For...** push button.
   - Choose the **For...** push button and create the For clause in the Expression Builder.

5. If you don't want records with duplicate index expression values to be included in the index file, choose the **Unique** check box when the index expression is tagged in the **Index On** list. A ! appears next to the index expression. Only the first record encountered with the specified value will be included in the index file.

6. When you're satisfied with the expression in the **Index On** list, choose **OK.** The Setup dialog reappears with the new index in the **Indexes** list.

Creating an Independent Compound Index

An *independent* compound index file *never* has the same name as the database and will not automatically open with a database. It must be explicitly opened for a database.

To create an independent compound index:

1. Choose the **CDX** radio button in the Output area at the bottom of the Index dialog.
2. Uncheck the **Structural** check box.
3. Then, do *one* of the following:
   - Choose a field from the **Database Fields** list so that it appears in the **Index On** list.
   - Type the index expression in the text box below the **Expr...** push button. Type a tag name for the index entry in the Tag Name text box. Choose the **Move** push button to copy the expression to the **Index On** list.
   - Choose the **Expr...** push button and use the Expression Builder to create an index expression. Type a tag name for the index entry in the Tag Name text box. Choose the **Move** push button to copy the expression to the **Index On** list.
4. If you want a For clause in your index expression, do *one* of the following:
   - Type the clause in the text box next to the **For...** push button.
   - Choose the **For...** push button and create the For clause in the Expression Builder.
5. If you don't want records with duplicate index expression values to be included in the index file, choose the **Unique** check box when the index expression is tagged in the **Index On** list. A ! appears next to the index expression. Only the first record encountered with the specified value will be included in the index file.
6. When you're satisfied with the expression in the **Index On** list, type a name for your new file in the text box below the **Save As...** push button or choose the **Save As...** push button to display the Save As dialog. In the Save As dialog, you can specify

the directory where the new file will be stored and name the file. Type a name in the text box and choose **OK**.

7. Choose the **OK** push button in the Index dialog. The Setup dialog appears with the new index in the **Indexes** list.

Compact Single Entry Index Files

The single entry index file is limited to one index entry. This index file must be explicitly opened and active to be updated with a database. The number of single entry index files that you can have open per database file is limited by file handles. This is also true for the Extended version of FoxPro 2.5.

You can now make a single entry index file *compact* so that it is smaller, faster and requires less disk space. Compact single entry index files are useful if you're using the index only for a limited time and you're going to delete it when you're finished using it.

Creating a Compact Single Entry Index

To create a compact single entry index:

1. Choose the **IDX** radio button in the Output area at the bottom of the Index dialog.
2. Check the **Compact** check box.
3. Then, do *one* of the following:
   - Choose a field from the **Database Fields** list so that it appears in the **Index On** list.
   - Type the index expression in the text box below the **Expr...** push button and choose the **Move** push button to copy the expression into the **Index On** list.
   - Choose the **Expr...** push button and use the Expression Builder to create an index expression. Then choose the **Move** push button to copy the expression into the **Index On** list.
4. If you want a For clause in your index expression, do *one* of the following:
   - Type the clause in the text box next to the **For...** push button.
   - Choose the **For...** push button and create the For clause in the Expression Builder.
5. If you don't want records with duplicate index expression values to be included in the index file, choose the **Unique** check

box when the index expression is tagged in the **Index On** list. A ! appears next to the index expression. Only the first record encountered with the specified value will be included in the index file.

6. When you're satisfied with the expression in the **Index On** list, type a name for your new file in the text box below the **Save As...** push button or choose the **Save As...** push button to display the Save As dialog. In the Save As dialog, you can specify the directory where the new file will be stored and name the file. Type a name in the text box and choose **OK**.

7. Choose the **OK** push button in the Index dialog. The Setup dialog appears with the new index in the **Indexes** list.



Non-compact single entry index files should be created *only* if you need to maintain compatibility with older versions of FoxPro (prior to FoxPro 2.0) or if you're sharing data with FoxBASE+ and FoxBASE+ for the Macintosh.

Modifying an Index Expression

It is possible to change an existing index expression. First, select the index name from the **Indexes** list. To modify the index expression, choose the **Modify...** push button on the *right side* of the Setup dialog.

The Index dialog appears with the index expression in the **Index on** list. Make changes to the index expression and For clause using the same methods you used to create a new index.

Setting Record Order

Only one compound index tag or one single entry index file controls the order of records in a database at any one time.

A leading bullet (•) appears in the **Indexes** list next to the index entry or tag that controls the logical order of your database records.

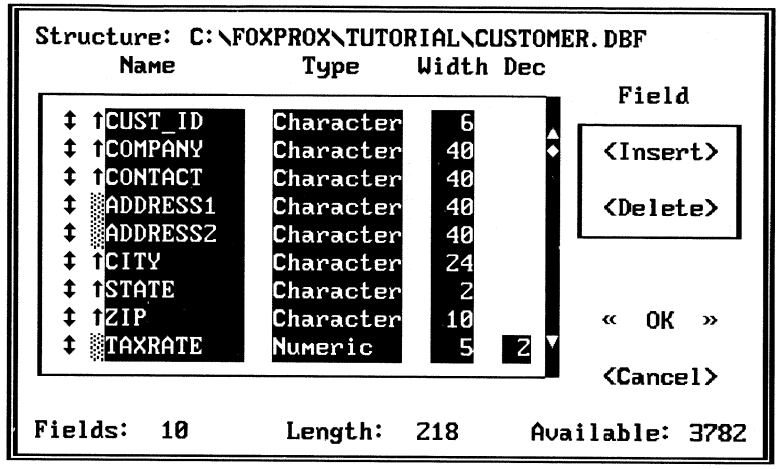
To change the logical order of your database, choose the desired index from the list, and then choose **Set Order**.

If the index you chose already controls the order of the database, the **Set Order** push button appears as **No Order**. If you chose **No Order**, none of the open indexes controls the order of the database. Instead, the database records are accessed, processed and displayed according to record number.

Modifying Database Structure

The **Structure** list in the Setup dialog displays all fields for the selected database along with their type, width and number of decimal places.

To change the structure of your database, choose the **Modify...** push button located *in the upper left corner* of the dialog. The Structure dialog appears.



Structure Dialog

In this dialog you can:

- Assign and change the field names and attributes for your database
- Insert and delete fields in your database
- Change field sizes and types
- Add and remove compound index tags

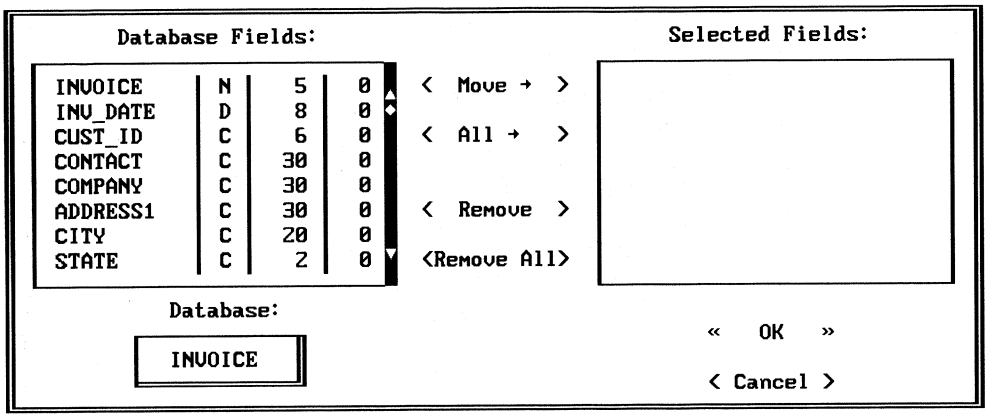
The Structure dialog is described in New in the File Menu chapter of this manual.

When you are finished making modifications, choose **OK**. A dialog appears to ask if you want to make the structure changes permanent. Choose **Yes** to make the changes permanent or **No** to return to the Structure dialog without taking action.

Setting Fields

The **Set Fields...** check box lets you specify which fields in the selected database file will be active. Fields that are *not* active cannot be accessed, examined or modified — it's as if they don't exist. Data in the database itself is not affected by your use of the **Set Fields...** check box.

To specify active fields, choose the **Set Fields...** check box. The Field Picker dialog appears.



Field Picker Dialog

The current database name is displayed on the popup at the bottom of the dialog. All field names in the current database are listed in the **Database Fields** list. The **Selected Fields** list is empty now but will display any field names that you specify as active.

Six push buttons are located in the Field Picker dialog:

Move Copies the selected database field in the **Database Fields** list to the **Selected Fields** list. This text button is disabled unless a field is selected in the **Database Fields** list.

All Copies all of the database fields in the **Database Fields** list to the **Selected Fields** list.

Remove Removes the selected database field from the **Selected Fields** list. This push button is disabled unless a field is selected in the **Selected Fields** list.

Remove All Deletes all fields from the **Selected Fields** list.

Cancel Cancels the Field Picker dialog without taking any action and returns to the Setup dialog.

OK Takes any actions that you specified in the Field Picker dialog and returns to the Setup dialog.

Two radio buttons are located under the **Set Fields...** check box in the Structure dialog. These radio buttons determine whether or not you can access all of your database fields.

On Allows you to access fields that you specified as active with the **Set Fields...** check box.

Off Allows you to access all fields in all open databases, no matter what you specified with the **Set Fields...** check box.

Setting a Filter

To specify which records in the active database will be available for processing, choose the **Filter...** check box. The Expression Builder dialog appears. Create a condition that records must meet before they will be made available for processing. For more information about the Expression Builder, refer to the File Menu chapter.

Only records that match your filter expression are displayed or are available for processing — it's as if the database contains only those records.

Selecting a Screen Format File

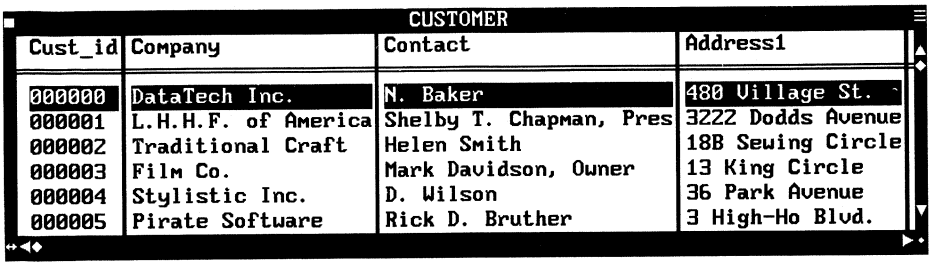
To assign a user-defined format file to a database for data input, choose the **Format...** check box in the Setup dialog. The Open File dialog appears. Select the desired form from the list and choose **Open**.

When **Format...** is checked in the Setup dialog, choosing **Change** or **Append** displays your custom input window for use instead of the default window.

Browse

Examine and/or edit the active database

Browse allows you to examine and make changes to a database. In a Browse window, the name of the database appears as the window title. The contents of the database appear in the window.



CUSTOMER

Cust_id	Company	Contact	Address1
000000	DataTech Inc.	N. Baker	480 Village St.
000001	L.H.H.F. of America	Shelby T. Chapman, Pres	3222 Dodds Avenue
000002	Traditional Craft	Helen Smith	18B Sewing Circle
000003	Film Co.	Mark Davidson, Owner	13 King Circle
000004	Stylistic Inc.	D. Wilson	36 Park Avenue
000005	Pirate Software	Rick D. Bruther	3 High-Ho Blvd.

Browse Window

The Browse window is unique because you can split it into two partitions and examine different parts of your database at the same time. In addition, you can edit field data, delete and append records, move and resize fields, and more.

You can open a Browse window in many ways:

- Choose **Browse** from the **Database** menu popup.
- Choose the **Browse** push button in the View window when a database is open in the current work area.
- Double-click on a work area that has an open database.

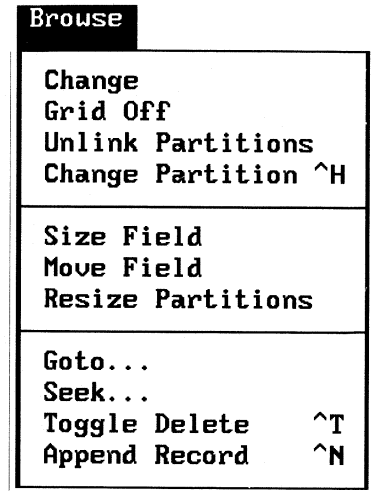
When you use any of these methods, FoxPro performs a BROWSE LAST. The data will be displayed in the Browse window as it appeared before you last closed it. The fields are in the same positions and are the same sizes as the last time the window was open. Any modifications you make through dialogs or commands will not be reflected in the display.

When you open a Browse window using the BROWSE command in the Command window or a program file, the Browse window appears in its original form (as specified in the Structure dialog).

Whenever a Browse window is frontmost, a **Browse** menu pad is added to the menu bar.

Browse Menu Popup

The **Browse** menu contains options for use in the Browse window. Some options are available only when the window is split.



Browse Menu

Change Displays the database in the Browse window in Change mode. The current record in the Browse window appears selected. Change mode for the Browse window is described in the Record Menu chapter.

In Change mode, the fields in each record are listed one below the other instead of stretching across the window horizontally. If the window is split, only the active partition appears in Change mode when you choose **Change**.

Change toggles between **Change** and **Browse** depending on the mode of the Browse window.

Grid Off Removes the vertical lines between field data in the Browse window. If the window is split, only the active partition is affected.

The **Grid Off** option toggles between **Grid Off** and **Grid On** depending on the current grid setting.

Unlink Partitions Displays a vertical scroll bar in both partitions so that you can scroll each partition independently of the other. This option is enabled only when the window is split. When only one scroll bar is displayed, the partitions are linked and will scroll together.

This option toggles between **Link Partitions** and **Unlink Partitions**, depending on the current state of the window.

Change Partition Makes the inactive partition of the split window active, and the active partition inactive. This option is enabled only when the window is split.

Size Field Selects a field so that you can change its size using the keyboard. If the selected field isn't the one you want to size, Tab to select the appropriate field. Once the desired field is selected, use the Left/Right Arrows to shorten or lengthen the field. When the field is the desired size, press Enter.

When the window is split, field sizing affects both partitions.

Move Field Selects a field so you can move it to a new location using the keyboard. If the selected field isn't the one you want to move, Tab to the appropriate field. Once the desired field is selected, use the Left/Right Arrows to relocate the field. When it is relocated, press Enter.

When you move a field in one partition of a split window, the same field moves to the same location in the other partition.

Resize Partitions Activates the window splitter so that you can partition the window or change the size of the existing partitions using the keyboard. You can tell that the window splitter is activated because it flashes. Use the Left/Right Arrows to resize the partitions, then press Enter. The window splitter stops flashing.

Goto... Displays a dialog so you can position the record pointer on a specific record in the Browse window. FoxPro allows you to position the record pointer at the **Top** or **Bottom** record in the database, position on a certain **Record** number or **Skip** a certain number of records before positioning the record pointer.

Seek... Displays the Expression Builder so you can search the active database through an index. Create an expression based on the index key (the field on which your database is indexed), enclosing character strings in single quotes, double quotes or square brackets. If FoxPro finds a matching value in the current index file, the database record appears selected. For **Seek...** to be enabled, the database you are browsing must be indexed and the index must be open.

Toggle Delete Places (or removes) a bullet at the beginning of the selected record to mark (or unmark) it for deletion.

Append Record Adds a blank record to the end of the database.

Window Manipulation

The Browse window can be manipulated in many ways to make it visually appealing to you. The window can be split, and the fields can be resized and rearranged. These changes apply only to the Browse window and do not affect the actual database file.

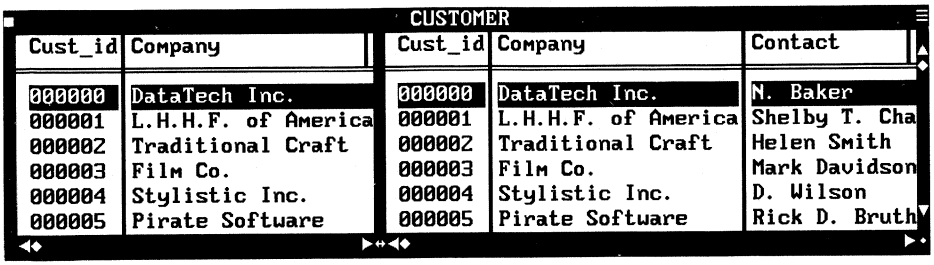
Splitting the Window

The Browse window is unique because you can divide it into two partitions. You divide the Browse window with a window splitter located in the lower left corner of the window. When Browse is divided, the database appears in both partitions.

To split the window using the keyboard, choose **Resize Partitions** from the **Browse** menu popup. This activates the window splitter.

To split the window into two partitions using the mouse, position the pointer on the window splitter. Drag the splitter to the right to make the left partition larger; drag the splitter to the left to make the left partition smaller (or to close it altogether).

When the Browse window is split, each partition has a horizontal scroll bar so you can scroll it independently of the other. There is only one vertical scroll bar for scrolling both partitions unless you choose **Unlink Partitions** from the **Browse** menu popup.



Split Browse Window

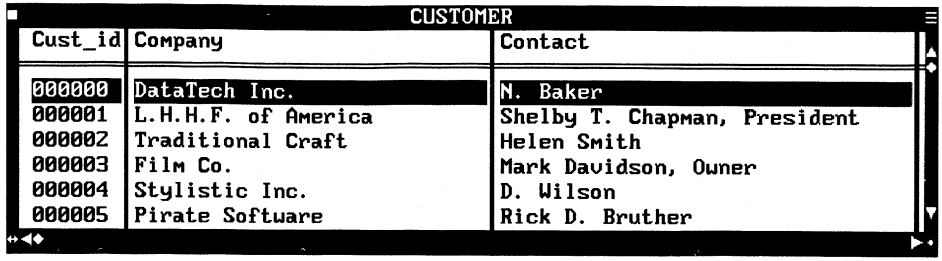
In a split window, the active partition is the one in which the cursor is flashing. Any actions that you perform take place in the active partition. To activate the inactive partition, choose **Change Partition** from the **Browse** menu popup or click in the desired partition with the mouse. All Browse actions can be performed in either partition of the window.

Changing Field Size

You can change the size of fields in the Browse window. This sizing does not change the actual width of the fields in the database, only the display width. If some of your data appears to get cut off when sizing, don't worry. The actual underlying data is still there.

To size a field using the keyboard, choose **Size Field** from the **Browse** menu popup. This selects a field so that you can change its size.

Using the mouse, position the pointer on the grid line to the right of the appropriate field name. Drag left or right to enlarge or decrease the size of the field.



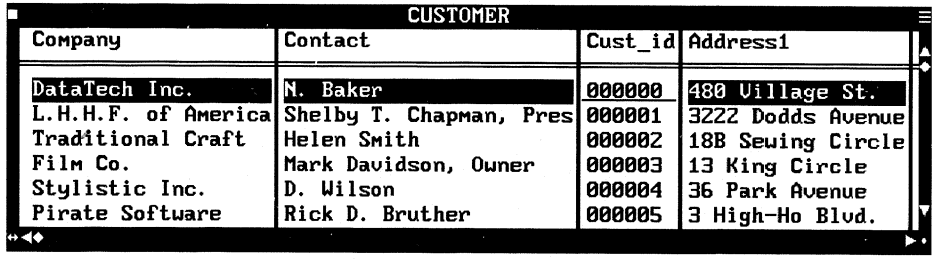
Browse Window with Sized Fields

Changing Field Order

You can change the order of fields in the Browse window. This does not change the actual order of the fields in the database, only the display order.

To move a field using the keyboard, choose **Move Field** from the **Browse** menu popup. This selects a field so that you can move it.

Using the mouse, position the pointer on the field name that you want to move. Drag left or right until the column is relocated.



Browse Window with Re-ordered Fields

Editing in Browse

In the Browse window, you can add and delete database records and change existing field data. These types of changes are reflected in the Browse window and in the actual database file.

Moving in Browse

To edit in a Browse window, you must know how to move around. Information in the window can be scrolled with the mouse by clicking the arrows at either end of the scroll bar. If you wish to edit field information, position the cursor in the appropriate location and edit as described below in Changing Field Data.

With the keyboard, you can move through windows of information using the PgUp and PgDn keys. When you Tab to a field that is not displayed in the window, the window scrolls horizontally. Once in a field, you can move the cursor using the Left/Right Arrow keys.

Changing Field Data

Different methods exist to change field data using the keyboard. The Tab key or Shift+Tab combination selects the next or previous field. The Up/Down Arrows move to the field above or below the current field. Once in a field, the Left/Right Arrows move the cursor in the specified direction. You can cut, copy, paste, backspace, delete, insert and overwrite as described in the Text Editor section of the Interface Basics chapter.

To select a portion of a field, position the cursor, hold down the Shift key and press the Left or Right Arrow until the portion is selected. To select the contents of an entire field, position the cursor at the beginning of the field, hold down Shift and press the End key.

To change field data using the mouse, position the pointer on a letter in a field. Now, you can backspace, delete, insert and overwrite as if in the text editor. Double-click on a word in a field to select it. Anything you type replaces the selected text. Triple-click on a field to select it entirely (necessary in cases where more than one word is present in a field). Anything you type will replace the selected text.

If you decide that you want to reverse a change, you can choose **Undo** from the **Edit** menu popup *if the cursor is still in the field you want to reverse.* Once you move the cursor to another field using the mouse or the keyboard, the change is saved. If you are in a field where no changes have been made, **Undo** is disabled.

Field information can also be changed by selecting the field, then choosing **Cut**, **Copy** or **Paste** from the **Edit** menu popup. For more information about these options, refer to the Text Editor section of the Interface Basics chapter.

Adding New Records

Records can be added between existing records or at the end of a database file. To add a new record to the end of a database file, choose **Append Record** from the **Browse** menu popup (or press Ctrl+N). An empty record is added to the end of your records in the Browse window. The cursor is positioned in the first field of the empty record. You can type the necessary information.

You can also add a record to the end of a database by choosing **Append** from the **Record** menu popup. The Browse window appears in Append mode with an empty record at the end of the database. The fields in the new record are listed one below the other. Type in the information. You can return to Browse mode by choosing **Browse** from the **Browse** menu popup.

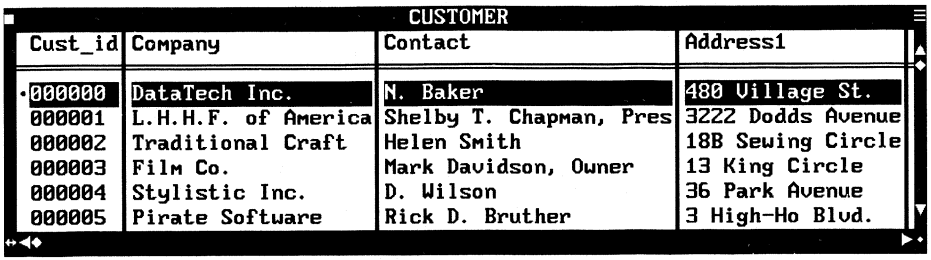
To add a new record below the selected record, type `INSERT` in the Command window. The database appears in Insert mode and displays the records previous to the insertion point and an empty record. Fields in each record are listed one below the other instead of side-by-side. Type the information in the appropriate spaces. To insert another record, press Enter when positioned in the last field of the new record.

When in Insert mode, you can display records in Browse mode by choosing **Browse** from the **Browse** menu popup. When in insert mode, only inserted records and the records previous to the insertion point will appear.

Deleting Records

When you mark a record for deletion in the Browse window, it remains in your database file. To *permanently remove* marked records from the actual database file, choose **Pack** from the **Database** menu popup. You may recall a record that has been marked for deletion in the Browse window as long as the database file has not been packed.

To delete a record using the mouse, position the pointer to the immediate left of the record that you want to delete, then click. A bullet appears next to the record, indicating that it is marked for deletion.



Record Marked for Deletion

You can continue to mark any other records that you want to delete in this manner. If you decide (before you pack the database file) that you want to keep a record that's been marked for deletion, click on the bullet in front of the record and the bullet disappears.

To delete a record using the keyboard, make sure that the appropriate record is selected and choose **Toggle Delete** from the **Browse** menu popup (or press Ctrl+T). A bullet appears to the left of the record, marking it for deletion. If you decide that you don't want to delete a record, select it and choose **Toggle Delete** from the **Browse** menu popup again to remove the bullet.



It is a good idea to make a copy of your database file before you pack. To *permanently remove* marked records from the database, choose **Pack** from the **Database** menu popup.

A pack may be interrupted by pressing the Escape key. Pressing Escape stops the pack and the database file remains unchanged. If you run out of disk space during a pack, FoxPro automatically recovers the database.

Calculated Fields

Through the Command window or a program file, you can create calculated fields for display in the Browse window. With calculated fields, you can determine what value will appear in an existing field by defining a field expression. For example, if you had several test grades in a database and a total points field, you could make the total points field a calculated field by creating an expression to add the test grades together.

Once you define a calculated field, the field can't be edited in the Browse window. However, if you change the contents of any fields that are part of the calculated expression, these changes are automatically reflected in the calculated field.

To create calculated fields, use the BROWSE FIELDS command in the Command window. In this command, you must list any field names from the current database that you want to be displayed in the Browse window, as well as field names and expressions for the calculated fields. Your command will appear similar to the following:

```
BROWSE FIELDS <field1>, <field2>, <field3>, < ... >, <fieldN>
```

Each <field> is the name of a field from the current database, and may be part of an expression for a calculated field. The following example opens a Browse window that contains fields for NAME, DAILY_PAY, DAYS and TOTAL_PAY (which is calculated field).

```
BROWSE FIELDS NAME, DAILY_PAY, DAYS, TOTAL_PAY=DAILY_PAY*DAYS
```

Returning to an Open Window

It is not necessary to close a Browse window in order to open another Browse window for a different database.

The names of all the open Browse windows are added to the bottom of the **Window** menu popup. To return to an open Browse window, choose its name from the **Window** menu popup. It appears as the frontmost (active) window on your screen. You can return to any Browse window in this manner as long as the associated database has not been closed.

You can also move different open windows to the front, including Browse windows, by choosing **Cycle** from the **Window** menu popup (or pressing Ctrl+F1).

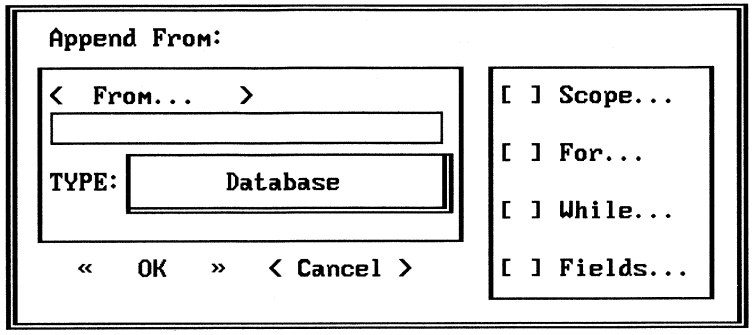
Closing the Browse Window

To close a Browse window, click the close box or choose **Close** from the **File** menu popup. If the View window was open when you opened Browse, it remains open so you can continue to work with database files and set FoxPro options. Closing the Browse window does not close the database.

Append From...

Add records from another database

Append From... adds records to the active database from another database. Choose **Append From...** to display the Append From dialog.



Append From Dialog

If you know the name of the database you want to copy records from, type its name in the text box. Otherwise, choose the **From...** push button to display a Directory dialog. Select the desired file from the list, then choose **OK**.

The **From...** data file does not have to be a .DBF file. You can specify other file types to copy records from using the **Type** popup in the Append From dialog.

Database	A standard FoxPro database file.
Delimited with Tabs	A text file in which each field is separated by one Tab.
Delimited with Commas	A text file in which each field is separated by one comma.
Delimited with Spaces	A text file in which each field is separated by one space.
System Data Format (SDF)	A text file in which the records have a fixed length and end with a carriage return and line feed.

Symbolic Link Format (SYLK) A Symbolic Link interchange format in which columns become fields and rows become records. SYLK files have no extension by default.

Data Interchange Format (DIF) A Data Interchange Format in which vectors (columns) become fields and tuples (rows) become records in the FoxPro database. DIF files have a default extension of .DIF.

Microsoft Excel (2.0) (XLS) A Microsoft® Excel (version 2) spreadsheet format in which column cells become fields and rows become records. These files have an .XLS extension.

Microsoft Multiplan (4.01) (MOD) A Microsoft Multiplan® (version 4.x) BIFF (Binary File Format) document in which spreadsheet rows become records and spreadsheet cells become fields. These files have an .MOD extension.

Symphony (1.0) (WRK) A Symphony® (versions 1.0 and 1.01) spreadsheet. These files have a .WRK extension.

Symphony (1.1/1.2)(WR1) A Symphony (versions 1.1 and 1.2) spreadsheet. These files have a .WR1 extension.

Lotus 1-2-3 (1A)(WKS) A Lotus® 1-2-3® (release 1-A) spreadsheet format in which column cells become fields and rows become records. A .WKS extension is assigned to these files.

Lotus 1-2-3 (2.x)(WK1) A Lotus 1-2-3 (release 2.xx) spreadsheet format in which column cells become fields and rows become records. A .WK1 extension is assigned to these files.

Lotus 1-2-3 (3.0)(WK3) A Lotus 1-2-3 (release 3.0) spreadsheet format in which column cells become fields and rows become records. These files have a .WK3 extension.

Paradox (3.5) (PDOX) A Paradox® (version 3.5) database file.

RapidFile (1.2) (RPD) A RapidFile® database file.

Framework II (FW2) A Framework II® spreadsheet.

Scope, For and While

Whenever FoxPro operates on records in a database, you usually need to specify which records will be affected by specifying Scope, For and/or While.

Note that the Scope and While check boxes at the right of the Append From dialog are dimmed; you can only specify a For clause in the Append From dialog.

Scope

Scope tells FoxPro to act on certain records in the current database. You can choose one of the following as the scope:

All The action affects all records in the database.

Next The action affects a range of records beginning with the current record and continuing for the number of records you specify in the text box by **Next**. **Next** 1 acts on the current record.

Record The action affects only the database record number that you specify in the text.

Rest The action affects a range of records beginning with the current record and ending with the last record in the file.

For and While Expressions

The range of an action can also be specified using a For and/or While expression.

To specify a For expression, check **For...** and create the logical expression that every record must meet to be affected by the command. Every record in the database is tested using the For expression.

The While expression specifies that the action affects database records only as long as the logical expression evaluates to true. The first time the expression evaluates to false, the action ceases without considering any remaining database records. To create a While expression, check **While...** and use the Expression Builder.

Scope, For expressions and While expressions can be used together. When For and While are both specified, the While expression takes precedence.

Specifying Fields

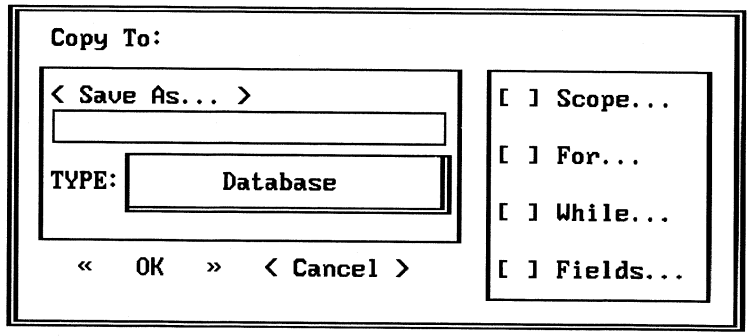
You can also specify fields to append. Choose the **Fields...** check box and the Field Picker dialog appears. For more information about the Field Picker, refer to Setup in this chapter.

When you are ready to append records, choose **OK**. To exit the dialog without taking action, choose **Cancel** or press Escape.

Copy To...

Copy the contents of a database

Copy To... displays the Copy To dialog.



Copy To Dialog

In this dialog, you can set the conditions that records must meet to be copied from the open data file to a new file. Type a name for the new file in the text box, or choose the **Save As...** push button to display a Save As dialog. In the Save As dialog, you can specify the directory where the new file will be stored and name the file.

If you **Copy To...** an existing file its contents will be replaced.

You can also choose a type for the new file. The following file types are available on the **Type** popup in the Copy To dialog:

Database	A standard FoxPro database file.
Delimited with Tabs	A text file in which each field is separated by one Tab.
Delimited with Commas	A text file in which each field is separated by one comma.
Delimited with Spaces	A text file in which each field is separated by one space.
System Data Format (SDF)	A text file in which the records have a fixed length and end with a carriage return and line feed.
Symbolic Link Format (SYLK)	A Symbolic Link interchange format in which columns become fields and rows become records. SYLK files have no extension by default.
Data Interchange Format (DIF)	A Data Interchange Format in which vectors (columns) become fields and tuples (rows) become records in the FoxPro database. DIF files have a default extension of .DIF.
Microsoft Excel (2.0) (XLS)	A Microsoft Excel (version 2) spreadsheet format in which column cells become fields and rows become records. These files have an .XLS extension.
Microsoft Multiplan (4.01) (MOD)	A Microsoft Multiplan (version 4.x) BIFF (Binary File Format) document in which spreadsheet rows become records and spreadsheet cells become fields. These files have an .MOD extension.
Symphony (1.0) (WRK)	A Symphony (versions 1.0 and 1.01) spreadsheet. These files have a .WRK extension.
Symphony (1.1/1.2)(WR1)	A Symphony (versions 1.1 and 1.2) spreadsheet. These files have a .WR1 extension.

Lotus 1-2-3 (1A)(WKS) A Lotus 1-2-3 (release 1-A) spreadsheet format in which column cells become fields and rows become records. A .WKS extension is assigned to these files.

Lotus 1-2-3 (2.x)(WK1) A Lotus 1-2-3 (release 2.xx) spreadsheet format in which column cells become fields and rows become records. A .WK1 extension is assigned to these files.

The check boxes on the right of the Copy To dialog allow you to establish Scope, For and While clauses. For a discussion of Scope, For and While, refer to Append From in this chapter.

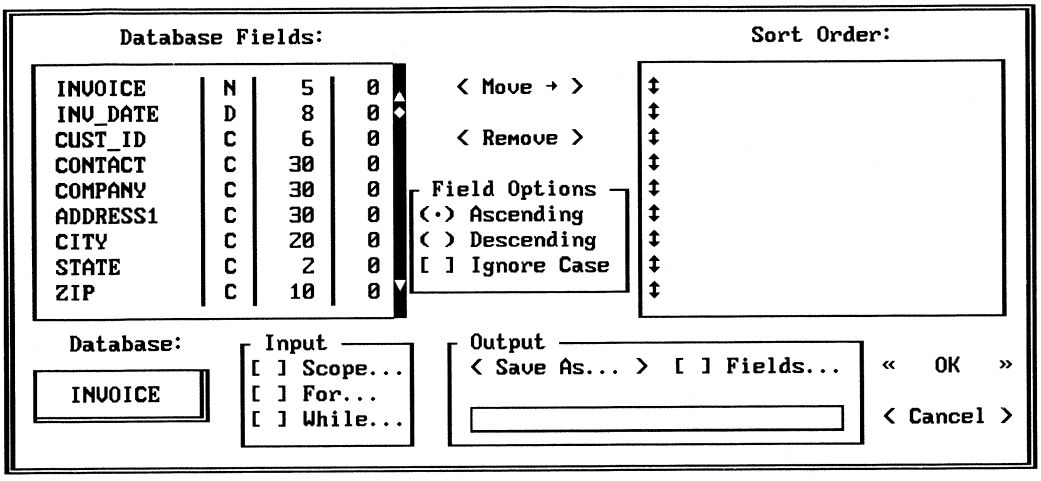
Choose the **Fields...** check box to display the Field Picker dialog. In the Field Picker, you can specify fields to be copied from any open database to the new file. For more information about the Field Picker, refer to Setup in this chapter. For information about establishing relations, refer to View in the Window Menu chapter of this manual.

When you are ready to copy records, choose **OK**. To exit the dialog without taking action, choose **Cancel**.

Sort...

Sort a database

Sort... creates a new sorted database from an existing database. Choose this option to display the Sort dialog.



Sort Dialog

The upper portion of the Sort dialog resembles the Field Picker dialog. This integrated Field Picker, when used with the Field Options box in the center, allows you to select which fields you will sort on and whether the fields will be sorted in ascending or descending order.

The **Database Fields** list displays the fields in the current database. To the right of each field name is a letter designating the type of field (Character, Numeric, Date, Logical, Float or Memo), followed by the size of the field and the number of decimal places. Memo fields are disabled because you cannot sort on this type of field.

Numeric vs. Character Sorts

Numeric and character fields are treated differently when data is entered into them and this difference affects the way a database sorts:

- Numeric fields fill from right to left, with empty spaces to the left.
- Character fields fill from left to right, with empty spaces to the right.

Character type fields that contain all numbers and spaces do not sort the way you might expect. For example, the number 1724 would precede the number 18 in a sort in ascending order unless the lower number is preceded with leading zeros (0018). Because the computer reads the ASCII codes in character fields from left to right, and because 17 (in 1724) is less than 18 (in 18), it puts 1724 first. To avoid this problem, always precede lower numbers with leading zeros or make the field a numeric type.

Specifying Sort Fields

Choose the fields you will sort on from the **Database Fields** list. If you want records beginning with upper- and lower-case letters to be sorted together, check the **Ignore Case** check box. If **Ignore Case** is not checked, all records beginning with upper-case letters will sort first, followed by records beginning with lower-case letters. Choose **ASCII Chart** from the **System** menu popup to see the sort order of all characters.

Your fields should appear in decreasing order of importance — the most important field should be first. You can easily change the order of your fields by dragging the double-headed arrow next to a field to the desired location in the list.

Below the **Database Fields** list is the **Database** popup. This popup displays the names of all active databases. If only one database is open, the popup is disabled. You can create a new, sorted database with fields from many databases. For the new database to have any meaning, you must first relate all the databases that you plan to use. For information about setting relations, refer to View in the Window Menu chapter.

You can also specify Scope, For and While clauses to determine which records will be included in the new database. For a discussion of Scope, For and While, refer to Append From in this chapter.

After you choose the appropriate Sort Order fields, you may want to specify certain fields to appear in the sorted output file. To do this, choose the **Fields...** check box and select the fields that will appear in the output file.

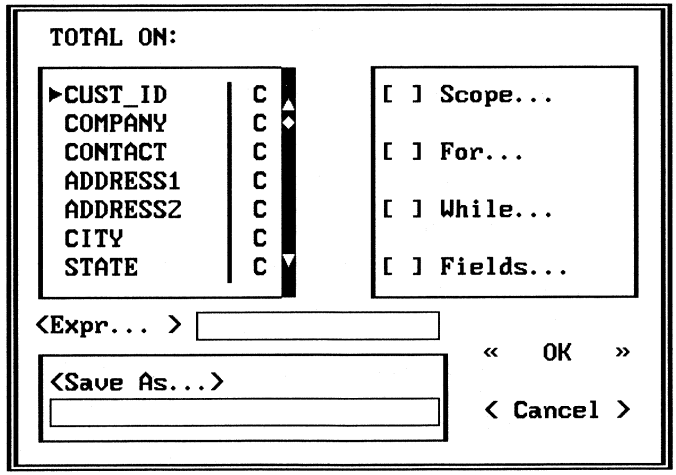
When you are satisfied with the fields in the Sort Order list, choose **OK**. Now, type a name for the output file in the text box below the **Save As...** push button, or choose **Save As...** and type a name for the output file, and then choose **Save**.

When you are ready to sort the database according to your specifications, choose **OK**.

Total...

Compute totals for numeric fields

Total... computes numeric field totals for records in the active database. These totals are placed into corresponding fields in a new database. When you choose this option, the Total dialog appears.



Total Dialog

The list contains the fields in the active database. In order to total, you must enter a field or an expression on which to total in the text box next to **Expr...**. Choose one of the fields from the list, type a field or an expression in the text box, or choose **Expr...** and create the expression to total. The database should either be

sorted on the field you use in the expression or controlled by an index based on the field or expression you specify.

You can also define Scope, For and While clauses to specify conditions that records must meet to be totaled. If you check the **Fields...** check box, the Field Picker dialog appears so you can specify fields on which to total. All records will be totaled unless you define a Scope, For or While clause. All numeric fields are totaled unless you specify certain **Fields...**. For a discussion of Scope, For and While, refer to Append From in this chapter. The Field Picker is described in Setup in this chapter.

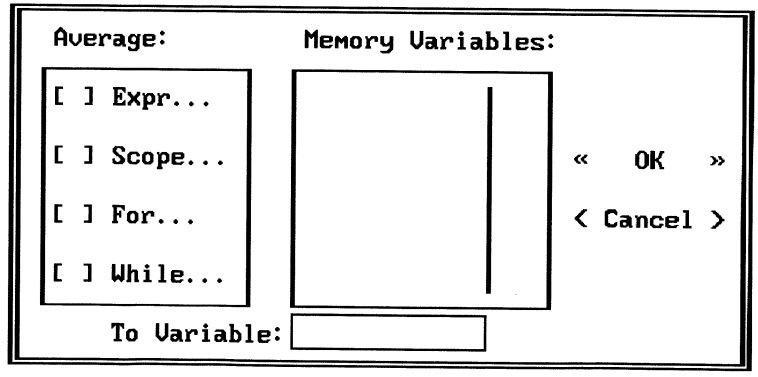
Type a name for the destination database file in the text box, or choose **Save As...** to display the Save As dialog so you can type a file name. The new database will include a record for each unique expression value encountered in the active database that meets conditions set by your Scope, For and While clauses.

Choose **OK** to compute the totals. To exit the dialog without taking action, choose **Cancel**.

Average...

Compute the average for numeric expressions

Average... displays the Average dialog so you can compute the average for a numeric expression.



Average Dialog

In the Average dialog, you can specify an expression to average selected numeric fields in the current database, or you can average all numeric fields in the database separately. To average fields separately, specify any necessary Scope, For and While conditions by checking the appropriate check boxes. When you're ready to average, choose **OK**.

To create an expression on which to average, check the **Expr...** check box and enter an appropriate expression in the Expression Builder. In the Expression Builder, you can build an expression using fields from related databases. Choose a new database from the **Database** popup when necessary. For information on relating databases, refer to View in the Window Menu chapter.

All records in the database will be averaged unless you specify a Scope, For and/or While condition. For a discussion of Scope, For and While, refer to Append From in this chapter.

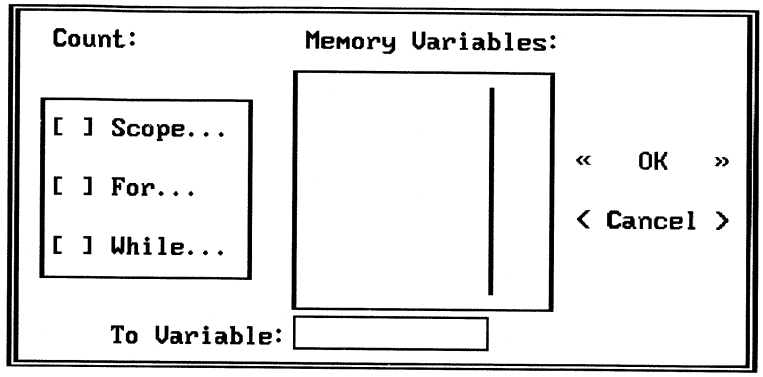
When you create an expression to average on, you can store the results of the **Average** operation in an existing or new memory variable. Just choose the existing variable from the **Memory Variables** list or type a name for the new variable in the text box. If you SET TALK ON, the results also appear in the current output window.

Choose **OK** to compute the average. To exit the dialog without taking action, choose **Cancel**.

Count...

Count database records

Count... returns a count of the records in the active database that fall within a specified scope. Choose this option to display the Count dialog.



Count Dialog

In this dialog, specify Scope, For and/or While clauses by checking the appropriate check boxes. The Expression Builder appears so you can create the clause. FoxPro counts the records that meet the Scope, For and/or While condition. The default Scope is **All**. If you don't specify For or While, all records in the Scope are counted. For a discussion of Scope, For and While, refer to Append From in this chapter.

Records marked for deletion are counted if you SET DELETED OFF. If you SET TALK ON, the message:

```
nnnnnn records
```

appears on the current output screen to tell you the number of records in the active database that meet the specified conditions.

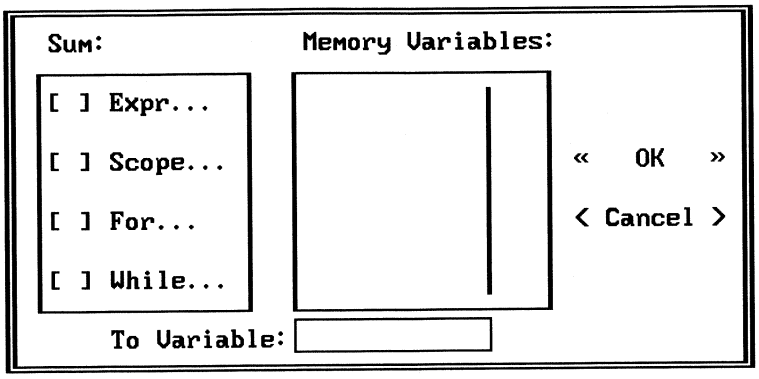
You can also place the count results in a new or existing memory variable. To place the results in an existing memory variable, choose the desired variable from the **Memory Variables** list so that it appears in the text box. To place the results in a new memory variable, type a new variable name in the text box.

Choose **OK** to count the records. To exit the dialog without taking action, choose **Cancel.**

Sum...

Calculate the sum of numeric fields

Sum... displays the Sum dialog so you can add the contents of numeric field variables in the active database.



Sum Dialog

In the Sum dialog, you can specify an expression to add selected numeric fields in the current database, or you can add all numeric fields in the database separately. To add fields separately, specify any necessary Scope, For and While conditions by checking the desired check boxes. When you're ready to sum, choose **OK**.

To create an expression on which to sum, check the **Expr...** check box and enter an appropriate expression in the Expression Builder. For more information on the Expression Builder, refer to New in the File Menu chapter.

All records in the database will be summed unless you specify a Scope, For and/or While condition. For a discussion of Scope, For and While, refer to Append From in this chapter.

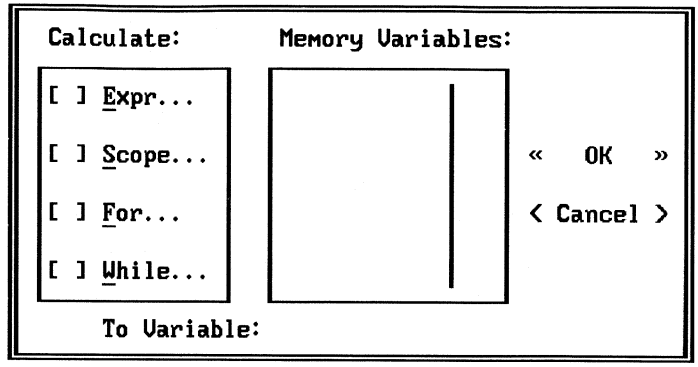
When you create an expression to sum, you can store the results of the **Sum** operation in an existing or new memory variable. Just choose the existing variable from the **Memory Variables** list or type a name for the new variable in the text box. If you SET TALK ON, the results also appear in the current output window.

Choose **OK** to calculate the sum. To exit the dialog without taking action, choose **Cancel**.

Calculate...

Perform financial and statistical operations

Calculate... displays the Calculate dialog so you can perform financial and statistical operations on fields in a database or on expressions involving fields.



Calculate Dialog

To create the expression to calculate, check the **Expr...** check box. A special Expression Builder dialog appears. This Expression Builder contains only one popup, **Math**, with a limited number of options.

Build an expression using the desired databases, fields, memory variables and the functions from the **Math** popup. You can string several expressions together using commas. If you string expressions, you must string together an equal number of memory variables to hold the calculated results, or refrain from using memory variables in the dialog.

The **Math** popup contains the following options:

AVG() Computes the arithmetic mean of a database field or field expression.

CNT() Returns the number of records in a database.

MAX() Returns the largest value of a database field.

MIN() Returns the smallest value of a database field.

NPV(,,) Computes the net present value of a series of future cash flows discounted at a constant periodic interest rate.

STD() Computes the standard deviation of the values in a field or field expression.

SUM() Totals the values in a field or field expression.

VAR() Computes the variation from the average of a field or legitimate field expression.

For more details about these menu options and about concatenating, refer to CALCULATE in the FoxPro *Language Reference*.

You can also specify Scope, For and While conditions to indicate which records will be involved in the calculation. Check the appropriate check boxes. For a discussion of Scope, For and While, refer to Append From in this chapter.

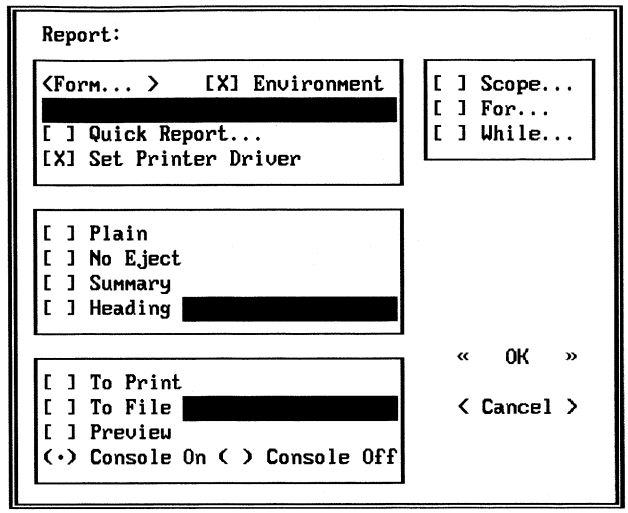
If you want to store the results of the calculation in an existing or new memory variable, choose the existing variable from the **Memory Variables** list or type the new variable name in the text box. If you decide to use memory variables and you concatenate several expressions together, be sure to concatenate an equal number of memory variables together in the text box below the **Memory Variables** list.

When you are ready to calculate, choose **OK**. To exit the dialog without taking action, choose **Cancel**.

Report...

Display and print reports

Report... brings forward the Report dialog so you can display or print reports from the selected database using a predefined report definition file. Report files are created using the FoxPro Report Writer and are saved to disk with the default extension of .FRX.



Report Dialog

Type the name of the desired report file in the text box, or choose **Form...** and select the appropriate file from the Open File dialog that appears.

All records in the active database are included in the report unless you specify a Scope, For and/or While condition. For a discussion of Scope, For and While, refer to Append From in this chapter.

When you create a new report, you can save environment settings in an .FRX database. Saving the report environment is explained in the Report Writer chapter of this manual. All information about the report is stored in fields in this .FRX database. The .FRX file contains work area information as well as all the settings in the On/Off, Files and Misc panels of the View window.

To restore the saved environment before running the report, check the **Environment** check box in the Report dialog. If you don't want to restore the settings, make sure **Environment** is not checked.

In addition to Scope, For and While, the Report dialog contains the following check boxes:

Quick Report Displays the Quick Report dialog so you can choose layout options and specify a name for the new report.

Printer Driver Setup Uses the printer driver setup saved with the report definition.

Plain Prints the report without page headers on each page. A page header appears only on the first page of the report.

No Eject Suppresses the initial form feed to the printer prior to printing the report.

Summary Prints only data in the Summary band of the report.

Heading Allows you to specify an additional heading line to print on each page of the report. Type the additional line in the text box.

To Print Sends the report to the designated printer.

To File Sends the report to an ASCII file.

Preview Allows you to view your report before you print it.

Two radio buttons are located at the bottom of the Report dialog:

Console On Displays the report on your screen while it runs. When you are printing a report, it is a good idea to choose the **Console Off** radio button because your report will run faster.

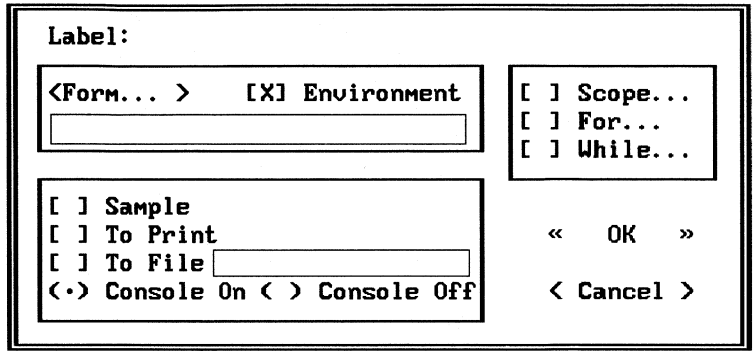
Console Off Stops the report from displaying on your screen while it runs. This makes your report run faster.

When your conditions and settings are correct, choose **OK** to begin running the report. If you change your mind and want to leave the dialog without taking any action, choose **Cancel**.

Label...

Print labels

Label... displays the Label dialog so you can produce labels using predefined label formats. Labels created in FoxPro have an .LBX extension.



Label Dialog

As in the Report dialog, type into the text box the name of the label file that you want to use, or choose **Form...** and select the appropriate file from the Open File dialog that appears.

If you don't specify Scope, For and/or While conditions, all records in the active database file are used. For a discussion of Scope, For and While, refer to Append From in this chapter.

When you create a label, you can save environment settings in an .LBX database. Saving the label environment is explained in New in the File Menu chapter of this manual. The .LBX file contains work area information as well as all the settings in the On/Off, Files and Misc panels of the View window.

To restore the saved environment before running the labels, check the **Environment** check box in the Label dialog. If you don't want to restore the settings, make sure **Environment** is not checked.

In addition to Scope, For and While, the Label dialog contains the following check boxes:

Sample Prints a sample label to test the alignment of your printer. The sample label contains asterisks to show the size and placement of fields on the label.

After the sample is printed, a dialog appears and asks "Do you want more samples?" Choose **Yes** to print another sample. This dialog will keep appearing after it prints the sample, allowing you to make adjustments. When the labels are aligned, choose **Do Labels** to run the labels. Choosing **Cancel** exits the dialog without taking action.

To Print Sends the labels to the designated printer. If you don't check **To Print**, the labels are displayed on the screen only.

To File Stores labels in an ASCII file.

Two radio buttons are located at the bottom of the Label dialog:

Console On Displays the labels on your screen while they run. When you are printing labels, it is a good idea to choose the **Console Off** radio button because your labels will run faster.

Console Off Stops the labels from displaying on your screen while they run. This makes your labels run faster.

When your conditions and settings are correct, choose **OK** to run the labels (or choose **Do Labels** as described above if you have printed samples). To leave the dialog without taking any action, choose **Cancel**.

Pack

Erase records marked for deletion

Pack *permanently removes* all records from the active database that have been marked for deletion. Before you pack a database, make a backup copy. All open index files associated with the database are rebuilt automatically when the database is packed.

A pack may be interrupted by pressing the Escape key. Pressing Escape stops the pack and the file remains unchanged. If you run out of disk space during a pack, FoxPro automatically recovers the database.



There is no way to retrieve deleted records after the PACK is finished. The deleted records are gone forever.

Deleting individual records from a database is described in Browse in the Database Menu chapter. For information about marking records for deletion that meet a certain condition, refer to Delete in the Record Menu chapter of this manual.

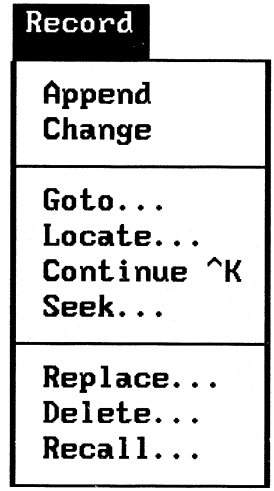
Reindex

Rebuild active index files

Reindex rebuilds any open index files associated with the active database. Occasionally, index files become corrupted. Choose **Reindex** to reconstruct any index files that do not accurately reflect the current status of the database.

6 Record Menu

Record menu options are for use with the records in your databases. The **Record** menu pad is disabled unless a database is open in a selected work area.

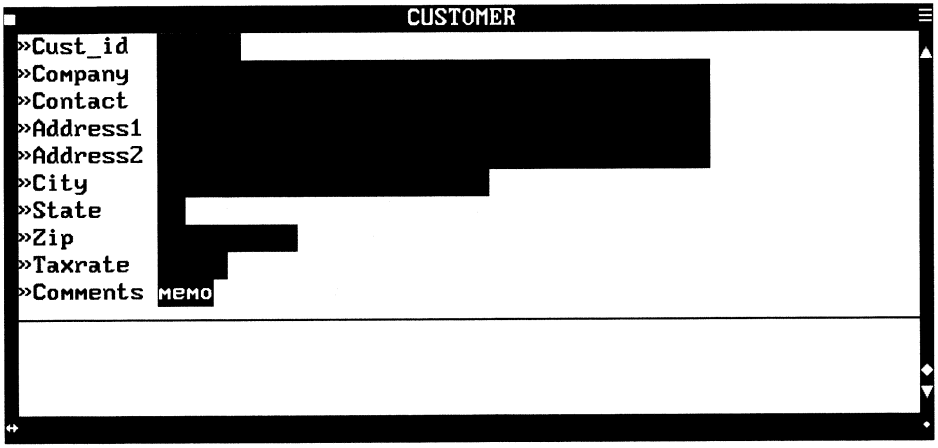


Record Menu

Append

Add records

Append allows you to add blank records to the end of the active database. Choose this option to display an input/editing window that contains the current database with a blank record at the end. You can enter data into the fields in this record. When you enter data in the last field and press Enter, another blank record is added to the end of the database. If a valid format file (.FMT) is set for the current database, the input screen specified by that file appears. If no format is set, the input window appears in default layout — the fields for each record are displayed one below the other in the window. The » symbol indicates you are in Append mode.



Browse Window in Append Mode

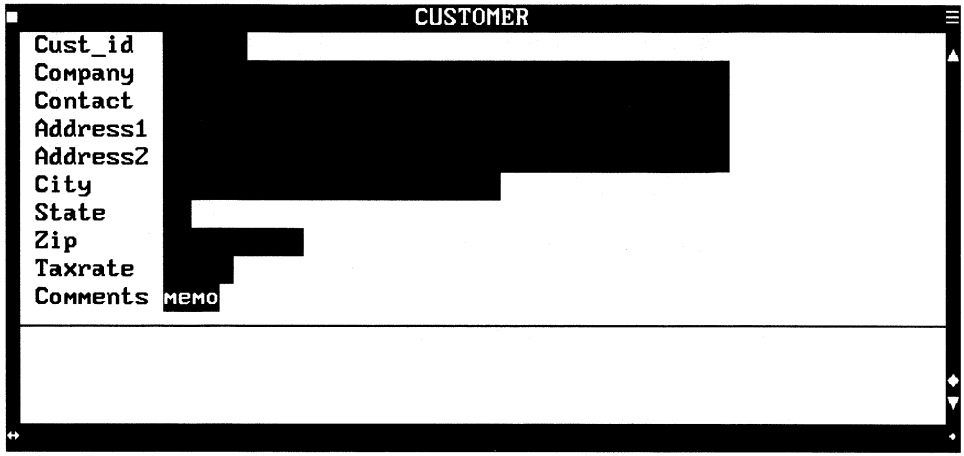
When in Append mode, a **Browse** menu pad is added to the menu bar. Append mode is just the Browse window in a different form. The first option on the **Browse** menu popup changes from **Append** to **Browse**, depending on the mode you are in. When you are in Append mode, **Browse** appears on the **Browse** menu. At any time you can choose **Browse** and continue your changes in Browse mode.

When you finish, choose **Close** from the **File** menu popup or click the close box. For more information, refer to Browse in the Database Menu chapter of this manual.

Change

Edit database records

Change allows you to edit data in the active database. Choose this option to display an input/editing window that contains the records in your database. If a valid format file (.FMT) is set for the current database, the input screen specified by that file appears. If no format is set, the input window appears in the default layout — the fields for each record are displayed one below the other in the window.



Browse Window in Change Mode

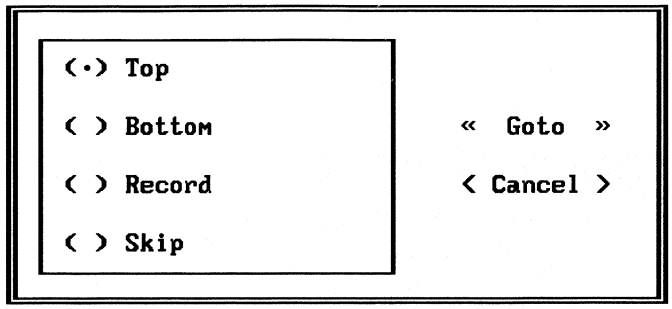
When in **Change** mode, a **Browse** menu pad is added to the menu bar. Change mode is just the Browse window in a different form. The first option on the **Browse** menu popup switches from **Change** to **Browse**, depending on the mode you are in. At any time you can choose **Browse** and continue your changes in Browse mode.

When you finish, choose **Close** from the **File** menu popup or click the close box. For more information about this option or the **Browse** menu popup, refer to Browse in the Database Menu chapter of this manual.

Goto...

Position the record pointer

Goto... displays the record pointer on a specific record in the selected database.



Goto Dialog

In this dialog, specify one of the following locations in the database where you want the pointer to be positioned:

Top Positions the pointer on the first record in the database.

Bottom Positions the pointer on the last record in the database.

Record Displays a text box so you can type the record number you would like to position on.

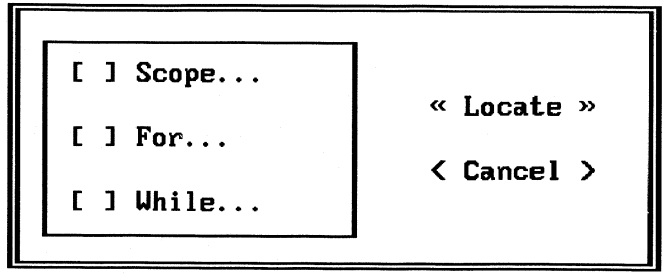
Skip Displays a text box so you can type the number of records you want to move forward from the current record position before FoxPro positions the pointer.

When you are ready to position the pointer, choose **Goto**. To exit the dialog without taking action, choose **Cancel** or press Escape.

Locate...

Look for a database record

Locate... displays the Locate dialog so you can look for a record in the active database that matches the specified conditions. Refer to Append From in the Database Menu chapter for a discussion of Scope, For and While.



Locate Dialog

Choose the appropriate check box(es). If you choose **Scope...**, you must choose the desired radio button in the Scope dialog that appears. The radio buttons in this dialog act the same as those in the Goto dialog. If you choose **For...** or **While...**, create the necessary expression in the Expression Builder.

When you are ready to look for a match, choose **Locate**. FoxPro searches for a matching record, starting at the beginning of the active database. If a matching record is found, the record pointer is positioned on that record.

If no match is found, FoxPro positions the record pointer at the end of the file or at the end of the specified scope.

To exit the dialog without taking action, choose **Cancel** or press Escape.

Continue

Continue to locate records

Continue causes FoxPro to resume the previously specified **Locate...**. This **Locate...** begins at the current position in the database. **Continue** is disabled until you perform a **Locate...**.

Seek...

Search an indexed database

Seek... displays the Expression Builder so you can search the active database through its index. For **Seek...** to be enabled, the active database must have an open index and the index order must be set.

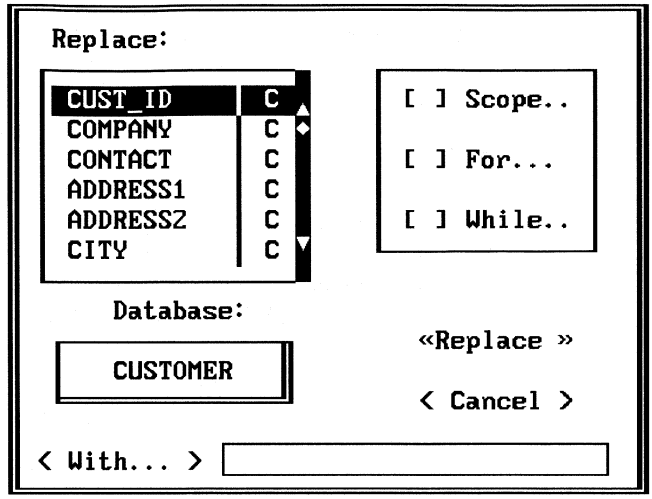
The expression you create in the Expression Builder must be based on the field that your database is indexed on. You must enclose character strings in single quotes (' '), double quotes (" ") or brackets ([ ]).

After you create an expression and choose **OK**, FoxPro evaluates the expression and looks for a matching value in the current index file. If you open a Browse window for the database after you choose **Seek...**, the record containing the matching value is selected. If no matching value is found, the last record in the file is selected.

Replace...

Update fields in database records

Replace... displays the Replace dialog so you can change field information in one record or in a range of records.



Replace Dialog

In the Replace dialog, you can select a field to be replaced from the list. If more than one database is open, you can replace fields from different databases by choosing the appropriate database from the **Database** menu popup. The fields in the **Replace** list change to reflect the contents of the new database.

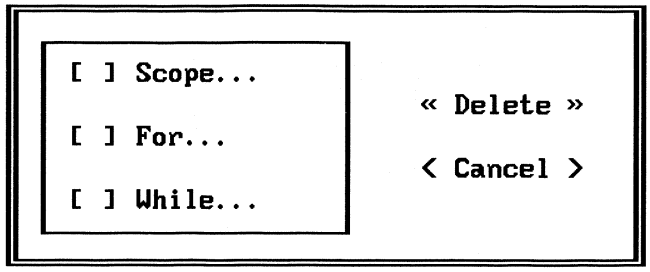
Type a replacement expression in the text box or choose **With** to display the Expression Builder and create a replacement expression. Specify any necessary Scope, For and/or While conditions. The default value for Scope in the Replace dialog is Next 1. Scope, For and While are described in Append From in the Database Menu chapter of this manual.

When the replace information is correct, choose **Replace** to make the replacement or **Cancel** to exit the dialog without taking action.

Delete...

Mark database records for deletion

Delete... displays the Delete Record dialog so you can mark records for deletion.



Delete Record Dialog

This option does not physically delete the records. Rather, it marks the specified records for deletion in the future. To *permanently remove* marked records, you must choose **Pack** from the **Database** menu popup. It is a good idea to make a backup copy of a database before you **Pack** it.

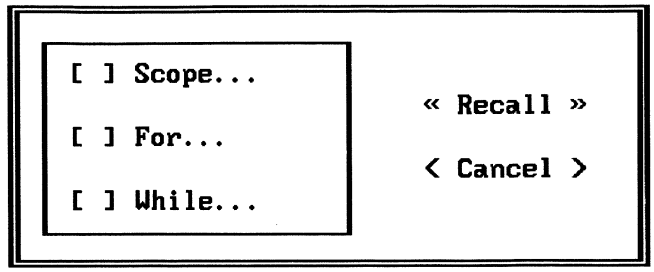
In the Delete Record dialog, you can specify Scope, For and/or While conditions. All records that meet the specified condition(s) are marked for deletion. The default value of Scope in the Delete dialog is Next 1. For a discussion of Scope, For and While, refer to Append From in the Database Menu chapter of this manual.

When you are ready to have FoxPro mark records for deletion, choose **Delete**. If you want to exit the dialog without taking action, choose **Cancel** or press Escape.

Recall...

Unmark records that are marked for deletion

Recall... displays the Recall dialog so you can unmark records that are marked for deletion. This is possible because FoxPro does not physically delete records until you choose **Pack** from the **Database** menu popup.



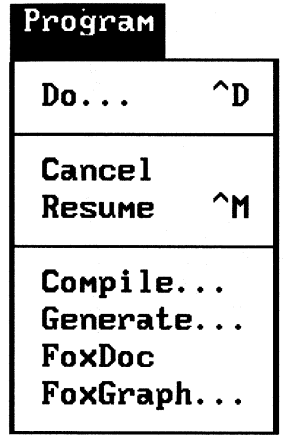
Recall Dialog

In the Recall dialog, you can specify any Scope, For and/or While conditions for the records you wish to recall. In the Recall dialog, the default for Scope is Next 1. Scope, For and While are described in the Append From section of the Database Menu chapter.

When you are ready for FoxPro to recall the specified records that are marked for deletion, choose **Recall**. If you want to exit the dialog without taking action, choose **Cancel** or press Escape.

7 Program Menu

Program menu options are used with FoxPro program files.

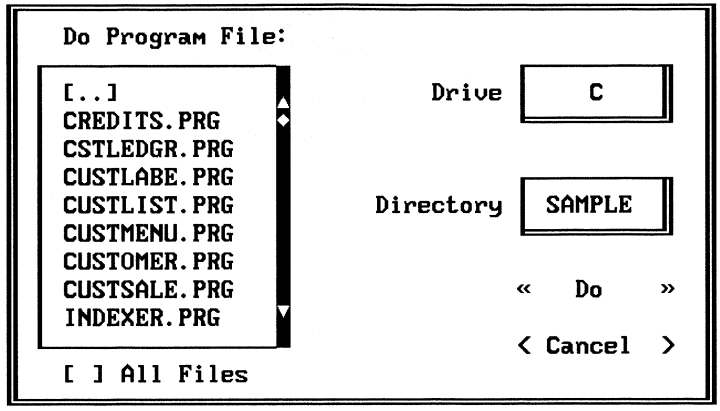


Program Menu

Do...

Execute a program file

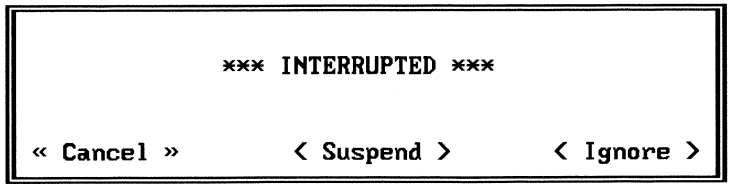
Do... displays a Do dialog so you can specify a program file to execute.



Do Dialog

Select the program file you want to run from the list, then choose **Do**.

When a program is running, FoxPro is not in interactive mode so the menu bar is not displayed. To interrupt a program that is running, press Escape. An alert appears.



Choose **Cancel** to end program execution and close the program file. To restart the program you must choose **Do...** from the **Program** menu popup.

Choose **Suspend** to stop running the program and return to the interactive menu system. The program file remains open and you can continue running the program by choosing **Resume** from the **Program** menu popup.

Choose **Ignore** to restart program execution at the point it stopped.

Cancel

End execution of a program file

Cancel prematurely ends execution of a suspended FoxPro program file. This option is enabled only after you choose **Suspend** to pause program execution.

Resume

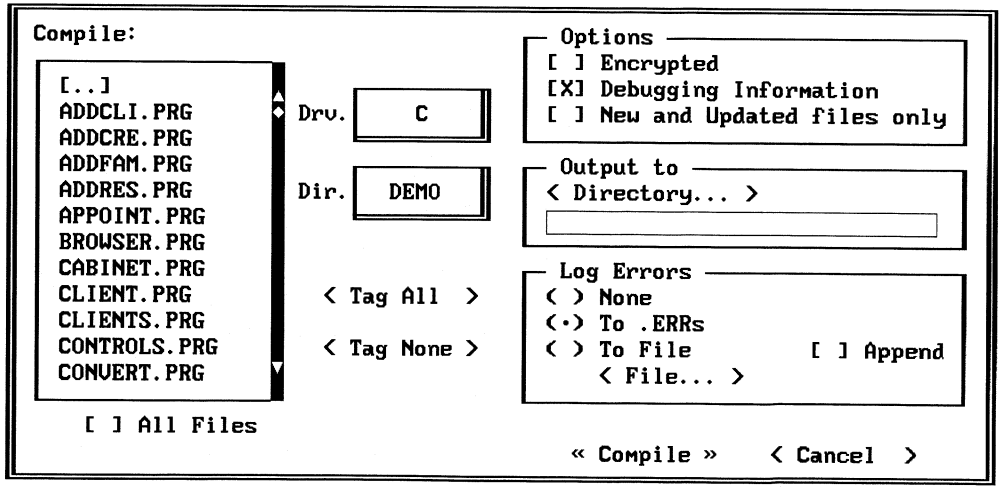
Restart a suspended program

Resume restarts execution of a suspended program at the line where execution paused when you chose **Suspend**.

Compile.../Compile

Compile the specified file(s)

Compile... displays the Compile dialog so you can compile program (.PRG), format (.FMT), menu (.MPR), screen (.SPR) and project (.QPR) files.



Compile Dialog

Compile...

Select or multi-select the desired file(s) from the list in the Compile dialog.

If you want to select all the file names in the list, choose **Tag All**.

If you select several file names and decide that you don't want to compile some of them, Shift+click or Shift+Spacebar on a file name again to deselect it. You can deselect all of the file names in the list by choosing **Tag None**.

Once you've selected the desired files, you can designate a directory where your output will be stored, a file where your error messages will be stored and other miscellaneous options. Refer to the next sections for more information.

When you are ready to compile your file(s), choose **Compile**. To exit the dialog without taking action, choose **Cancel** or press Escape.

Compile Options

Three check boxes are located in the Options area:

Encrypted — If you want your compiled files to be scrambled for security, check the **Encrypted** check box.

Debugging Information — When this check box is checked, you'll be able to see each line of your program highlighted in the Trace window during execution. For this to happen, FoxPro must include approximately two extra bytes per source program line. These two bytes are a reference to the corresponding program line in the source code. When you *uncheck* this check box then compile a program, you will not be able to see each line highlighted in the Trace window during execution.

New and Updated Files Only — Check this check box to compile only the selected files that are new or have been updated since they were last compiled.

Specifying an Output Directory

To specify a directory path where your compiled output files will be stored, type the path in the text box under **Directory...** in the Output To area, or choose **Directory...** to display a Directory dialog so you can choose the desired drive, directory and/or subdirectories. When the path at the top of the dialog is correct, choose **Select**.

Log Errors

Three radio buttons appear in the Log Errors portion of the dialog. Choose the **None** radio button if you don't want FoxPro to keep track of your errors when your program is compiled.

Unless the **None** radio button is chosen, FoxPro keeps track of any syntax errors when your file(s) are compiled. You can store these error messages in one of two types of error files: a log file or an .ERR file. You must decide which type of error file you want to create because only one of these file types can be created each time in the Compile dialog.

To store the error messages for each selected file in a separate file with the same base name as the original file, choose the **To .ERRs** radio button. An .ERR file is created for each file selected in the list, and is stored in the same directory as the source file. Each .ERR file has the same name as the associated source file, but has an .ERR extension.

To store the error messages for all the selected files together in a log file, choose the **To File** radio button. Type a name for the log file in the text box next to **File...** or choose **File...** so you can enter a name in the Save As dialog.

To add the error messages to an existing log file, specify the file and check the **Append** check box

Compile

When any type of program file is open in a window, the **Compile...** option on the **Program** menu popup appears as **Compile**. **Compile** automatically compiles the current program file.

When FoxPro finds an error in the program code during compilation, the erroneous line is highlighted in the editing window. A dialog appears on the screen to alert you to the error. Choose **Ignore** to ignore the current error and continue compilation. **Ignore All** ignores the current error and any subsequent errors encountered during compilation. **Cancel** stops compilation.

If you SET LOGERRORS ON before choosing **Compile**, the error messages generated during compilation will be stored in an .ERR file with the same base name as the source file.

Generate...

Generate code for screens/menus

For information on the **Generate...** option, refer to the section on code generation in the Screen Builder chapter or the section on code generation in the Menu Builder chapter.

FoxDoc

Document a system

FoxDoc displays the Document dialog and invokes FoxDoc, the automatic application system documenter for FoxPro programs. For more information about documenting programs with FoxDoc, refer to the FoxPro *Developer's Guide*.

FoxGraph...

Generate two- and three-dimensional graphs

FoxGraph... is disabled until you install FoxGraph® on your hard disk. FoxGraph, a separate graphics package that you can purchase for use with FoxPro, allows you to create 2-D and 3-D graphs from database files.

When you choose **FoxGraph...**, a dialog appears. Unless you check the **All Files** check box, only files with .GR3, .GRF and .GR4 extensions will appear in the list. These files contain graph descriptions.

If you want to load a file containing a graph description, select the file from the list and choose **Load**. A Graph Setup dialog appears containing information from the graph description.

To create a new graph description, choose **New**. A Graph Setup dialog appears so you can specify details about the graph.

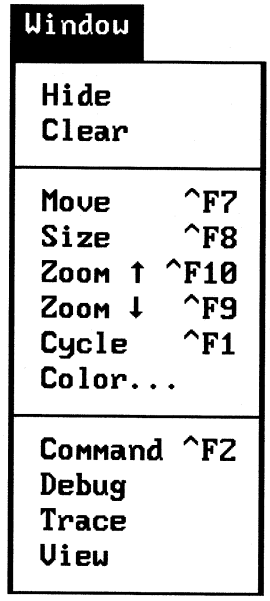
FoxGraph invokes FoxGraph without asking you to specify a graph description. The Graph Setup dialog is bypassed. Choose this push button when you want to work with graphs that already exist.

To exit the FoxGraph dialog without taking action, choose **Cancel** or press Escape.

For more information about FoxGraph, refer to the documentation that accompanies your FoxGraph package.

8 Window Menu

Window menu options are used to control windows.



Window Menu

Hide

Removes the active window from the screen

Hide removes the active system or user-defined window from sight. Hidden windows aren't closed — they're just not visible to you. Hidden windows remain active. Their names are displayed at the bottom of the **Window** menu popup.

Hide can be used repeatedly to remove windows from sight. To hide or display all open windows at once, hold down the Shift key while choosing the **Window** menu pad. The **Hide** option on the **Window** menu is replaced with options that allow you to **Hide All** and **Show All** windows.

You can momentarily hide all windows in front of the current output window (which may be the screen) by holding down Shift+Ctrl and pressing Alt.

To display a hidden window, choose its name from the bottom of the **Window** menu popup.

If the hidden window is a system window (for example, View or Command), you can display it by choosing it from the **Window** menu popup or using its Control key shortcut. Even though you choose **Close** from the **File** menu popup or click the close box, system windows remain active until you exit FoxPro. For example, open files will still be reflected in the View window and commands will still be recorded in the Command window even if these windows are hidden.

When you close a window, you must reopen it through the **File** menu popup, the View window or the Command window.

Clear

Clear the output window

Clear clears the current output window. If an output window is not active when you choose **Clear**, the background screen is cleared. The command equivalent for the **Clear** option is to type CLEAR in the Command window.



The **Clear** option on the **Edit** menu popup clears *selected* text from the active system window.

Move

Move window to a new location

Move selects the active window so you can move it to a new location on your screen. When you choose **Move**, the border of the current window flashes.

Use the arrow keys to move the window by small increments in the appropriate direction. Press PgUp and PgDn to move the window to the top or bottom of the screen. Press Home and End to move the window to the left or right edge of the screen. When you're finished, press Enter. The window border stops flashing.

If your system is equipped with a mouse, you don't need to use this menu option. You can click on the window title and drag the window to the desired location.

Size

Size the active window

Size selects the active window so you can change its size. When you choose **Size**, the border of the active window flashes. Press the arrow keys to adjust the right and bottom borders of the window. When the window is the desired size, press Enter and the window border stops flashing.

If your system is equipped with a mouse, you don't need to use this menu option. Instead, you can click on the size control in the lower right corner of the window and drag to adjust the frame size.

All windows with size controls can be sized. All user-defined windows that were defined with a GROW clause can also be sized.

Zoom ↑

Enlarge the active window

The **Zoom** ↑ option on the **Window** menu popup acts as a toggle between the current window size and full screen size.

If you are using a mouse, you can also enlarge and shrink windows by clicking on the zoom control in the upper right corner of the window.

Zoom ↓

Minimize the active window

Choosing **Zoom ↓** on the **Window** menu popup *minimizes* the current window. The window becomes one line tall by 16 characters wide with only the title of the window displayed.

You can also minimize the active window by double-clicking with the mouse on the top border of the window.

The zoom control in the upper right corner and the close box in the upper left corner of a minimized window show and are active even if the window is not frontmost. Using the zoom control on a minimized window will *not* bring the window forward.

To minimize the window and *dock* it in the lower right corner of the screen, do *one* of the following:

- Hold down the Shift key and choose **Zoom ↓** from the window menu popup.
- Hold down the Shift key and double-click the mouse on the top border of the window.

Reducing a window to a minimum size makes it easy to place many windows on the screen or in a window simultaneously and still have ample space for output. For example, you could reduce FoxPro desk accessories (the Calculator, the Calendar/Diary, the ASCII Chart, and so on) to their minimum size and place them along the bottom row of the screen for easy access and use.

To return a minimized window to its original size, do *one* of the following:

- Choose **Zoom ↓** from the **Window** menu popup.
- Double-click with the mouse on the top border of the window.

Cycle

Rearrange open windows to bring successive ones forward

Cycle rearranges open windows to bring successive ones to the front. When you choose **Cycle**, the active window moves to the back and the next window that was originally opened becomes the active window. Continue to choose **Cycle** until the window of your choice is frontmost.

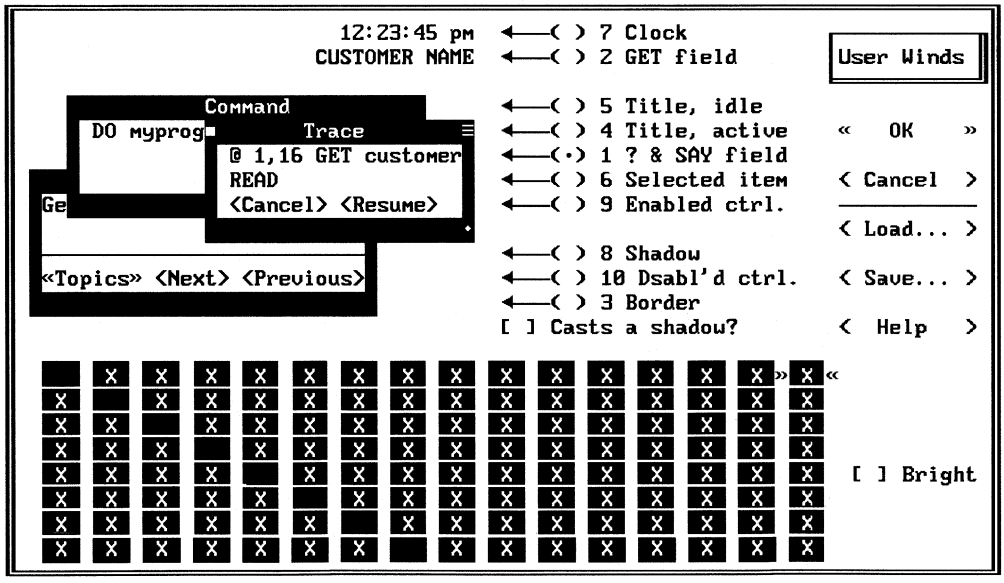
Color...

Adjust colors in windows and dialogs

Color... displays the Color Picker dialog. In this dialog, you can fully control the colors in FoxPro menus, popups, windows, dialogs, alerts and more. Users with monochrome monitors can adjust the intensity and contrast of the screen display.

There is no need to modify colors unless you are unable to see all of the details in a window or dialog. If the Report Layout window and the Browse window display properly, you should not modify your colors. If you have trouble seeing any details in the Report Layout window or the Browse window, many predefined color sets are available for you to load.

A color set consists of color assignments for all the options, or color schemes, on the popup in the upper right corner of the Color Picker.



Color Picker Dialog

Loading Color Sets

Choose the **Load...** push button to see the list of available color sets. There is probably one for your computer. If not, choose a color set for a similar computer and choose **Load**. Choose **OK** to exit the Color Picker and try the new color set. Choose **Clear** from the **Window** menu popup. If the color set is not suitable, load another color set. Continue to load and try out color sets until you find the best colors for your computer.

Modifying Color Sets

If none of the predefined color sets are suitable, you can modify the color set in the Color Picker dialog that most closely corresponds to your needs. Before making changes, you should understand that changing colors is similar to defining a printer driver. Many subtle relationships exist and you must keep these in mind when you make color choices.

If you want to make major changes to a color set or define an entirely new set, refer to the FoxPro *Developer's Guide*. If you modify a color set, you should save it under a new name to preserve the original color set.

A color palette is located in the lower left portion of the Color Picker. The color palette contains a wide range of *color pairs* from which you can choose. A color pair is a foreground and background color combination. In the color palette, each X represents a foreground color and the block behind it represents the associated background color.

You may assign a color pair to each of the ten radio buttons in the Color Picker dialog.



Only radio buttons with text labels have an effect on the interface colors.

Before you assign color pairs, you must choose the appropriate option from the popup in the upper right corner of the Color Picker. Each menu option represents an interface element like windows, dialogs, popups, and so on. Use the radio buttons to assign color pairs for each interface element.

When you choose an option (scheme) from the popup in the Color Picker, the names of the radio buttons change to reflect their function in the current scheme. If a radio button has no effect in a scheme, the color pair number appears with no name next to it. You should coordinate the color pairs of certain radio buttons to achieve visual clarity. Refer to the FoxPro *Installation and Configuration* manual for rules to follow when assigning color pairs.

All of the menu options, or color schemes, combine to make a complete color set for use with FoxPro. You can use different color sets for different purposes.

Assigning Colors

Choose an option from the popup so that you can determine its colors.

Color Picker Menu Options

Option	Description
User Winds	User windows (SET colors)
User Menus	User menus (SET colors)
Menu Bar	Menu pads on the system menu bar
Menu Pops	Menu popups
Dialogs	Dialogs and system messages
Dialog Pops	Popups and lists in dialogs
Alerts	Alerts
Windows	System windows
Window Pops	Menu popups and lists in windows
Browse	Browse window
Report	Report Layout window
Alert Pops	Lists in alerts created with the Screen Builder
Scheme 13–16	Reserved
Scheme 17–24	Available for user applications

The option you choose appears on the popup. All color choices you make apply to the option displayed on the popup.

Once you've chosen an option from the popup, you can assign a color pair to each radio button. To do this, choose a radio button by clicking with the mouse, or Tabbing to the radio button and pressing the Spacebar. The current color pair for that radio button appears selected in the color palette.

If you need to modify the color pair, choose a new color pair from the color palette. With the mouse, click on the desired color pair. With the keyboard, use the arrow keys to move to the desired color pair, then press the Spacebar.

Use the following check boxes as necessary to complete your color scheme.

Casts a Shadow ? Displays FoxPro shadows for the interface element on the popup in the upper right corner of the Color Picker. Make sure the desired interface element appears on the popup before you check the **Casts a Shadow ?** check box to indicate that you want shadows.

Bright Intensifies the background color associated with the current radio button. When you check **Bright**, 128 new color pairs become available if your monitor is EGA/VGA. If you have a color monitor and don't see the **Bright** check box, type `SET BLINK OFF` in the Command window and the check box appears in the Color Picker. This check box is not available on monochrome monitors.

Blink Causes objects associated with the chosen radio button to blink. Blink settings are saved with your color sets. If you don't see the **Blink** check box, type `SET BLINK ON` in the Command window and the check box appears in the Color Picker dialog.

Continue to choose radio buttons and assign color pairs until all of the colors are properly adjusted for the current color scheme (displayed on the popup).

Repeat this entire process for each option on the popup until you are satisfied with the color assignments. Together, all the menu options (color schemes) make up a complete color set.

Copying Color Schemes

When you want to use the same colors from one color scheme in another color scheme, you can copy and paste the color pair assignments. First, choose the color scheme with the desired colors from the popup in the Color Picker. Choose **Copy** from the **Edit** menu popup.

Now, choose the color scheme that you want to apply these colors to from the popup in the Color Picker dialog. Choose **Paste** from the **Edit** menu popup. The colors from the first color scheme are applied to the second color scheme.

Saving Color Sets

Before you save a modified color set, check to see that it has the desired effect on each type of window and dialog. If you want to save the most recent color assignments for all the interface elements on the popup, choose the **Save...** push button. A dialog appears. Type a new name for the color set in the text box, then choose **Save**.

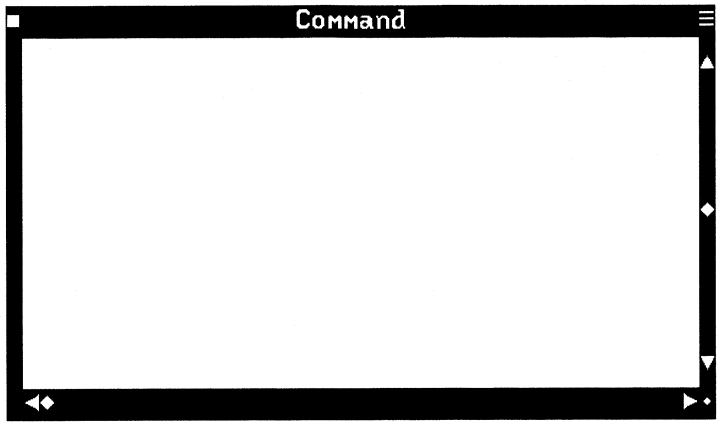
Exiting the Color Picker

The color set in the Color Picker dialog can be applied to the current FoxPro session by choosing **OK**. **Cancel** closes the Color Picker without applying new colors in the current FoxPro session.

Command

Bring forward the Command window

Command displays the Command window. The Command window is a FoxPro system window. When you choose options from popups, you're actually generating FoxPro commands in the Command window.



Command Window

You can also type FoxPro commands directly into the Command window. Just position the cursor in the Command window and type. Press Escape to delete text you've typed in the Command window if you haven't pressed Enter yet.

FoxPro stores all commands in a history list so that you can recall, edit and re-execute them. Commands can be recalled by scrolling through the Command window until you find the command. To re-execute a command, position the cursor anywhere on the appropriate command line and press the Enter key.

To edit a command, scroll through the Command window until you find the appropriate command. Add, delete or change any information in the command using FoxPro's text editing capabilities then press the Enter key to execute the modified command.

Command Continuation

Lengthy commands, such as a SQL SELECT command or a BROWSE with multiple options, frequently extend beyond the right margin of the Command window. When this happens, you can split the command onto multiple lines for easier editing and viewing. Lines in programs can also be split in the same manner.

To keep a long command from going beyond the right margin in the Command window:

1. Type a semicolon (;) where you want to break the command. The semicolon must follow a space in the command.
2. Press Enter to move the cursor to the next line in the Command window.
3. Type the remainder of the command.

Although your command is now on more than one line, FoxPro will read the separate lines as a single command. To execute a command split onto multiple lines, place the cursor anywhere in the command and press Enter.

Automatic Indentation

You can manually indent a command in the Command window by pressing Tab.

Automatic indentation is also available when you enter program code in the Command window. Auto indent allows you to easily construct indented program code.

To indent a command in the Command window, press Tab. You may press Tab repeatedly for additional indentation.

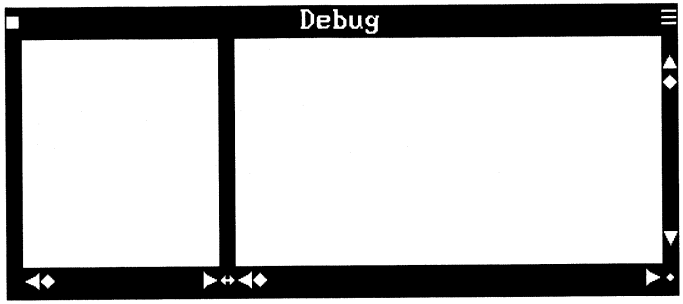
After a line is indented in the Command window, any continuation lines are automatically indented the same amount when you press Enter.

Indentation greatly improves the readability of commands split onto multiple lines in the Command window. See the discussion on command continuation above for information on splitting commands onto multiple lines.

Debug

Display the Debug window

Debug displays and activates the Debug window. In the Debug window, you can monitor the values of variables and expressions and set break points in programs.



Debug Window

To monitor values in your programs, position the cursor in the left partition of the Debug window by clicking with the mouse or pressing Tab until the cursor appears in the left partition. Now you can type the variables and expressions that you want to monitor in the left partition of the Debug window. *Make sure you press Enter* after each variable or expression you type in the window. If you enter an expression that contains incorrect syntax, you'll hear a beep.

You cannot enter expressions that involve macro substitution in the Debug window.

As your program executes, the values are displayed in the right partition of the Debug window. The variables and expressions can be related to more than one module or program. You can enter up to 16 debugging items in the Debug window, then switch back and forth between modules and programs to monitor every step of program execution.

You can set a program breakpoint based on a variable or expression in the Debug window. To set a program break, you must mark the break in the breakpoint column that separates the left and right partition of the Debug window. With the mouse, click in the breakpoint column to the right of the variable or expression that sets the break condition. With the keyboard, Tab until a highlighted block appears in the breakpoint column, then use the Up and Down Arrows to position the block next to the desired variable or expression and press the Spacebar. A diamond appears to

indicate that a breakpoint is set. To remove a breakpoint, position on it and click or press the Spacebar.

When the value of a variable or expression at a breakpoint changes, program execution is suspended. The message "Do suspended" appears on the screen and the Trace window appears if it is not already displayed. Now you can change the values of variables in the Trace window, make changes in the Debug window and perform other FoxPro tasks. You can also choose to **Cancel** or **Resume** program execution by choosing these options from the **Program** menu popup.

You can scroll the Debug window at any time using conventional scrolling techniques. To adjust the size of the Debug partitions, drag the window splitter with the mouse. With the keyboard, Tab until the window splitter is selected and press the Left and Right Arrows to adjust the partition sizes.



If the values of your variables and expressions don't appear in the right partition of the Debug window when you **Do...** the program:

1. Check that you have pressed Enter after every entry in the left partition. If you press Enter after an entry and hear a beep, the entry contains incorrect syntax.
2. Check that the right partition is scrolled so that the left edge is visible.
3. Check that you don't have expressions involving macro substitution.

Trace

Display the Trace window

The Trace window displays your program code, highlighting each line as it is executed.

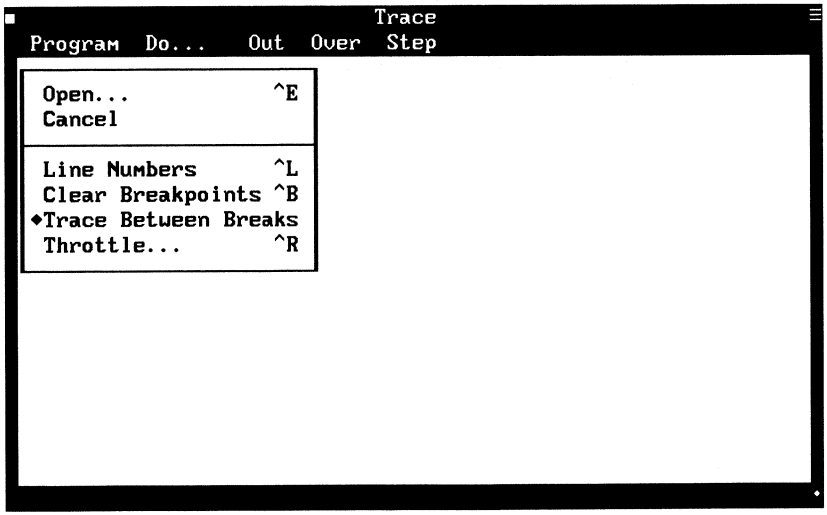
To help you debug your program, you can set breakpoints in the Trace window on any line(s) of code where you want program execution to pause. Program execution suspends just before executing the line with the breakpoint.

The names of the currently running program and procedure are displayed at the bottom of the Trace window.

Trace Menu Bar

The Trace window has its own menu bar.

When you open the Trace window and no program is executing, five menu pads appear on the Trace menu bar: **Program**, **Do...**, **Out**, **Over** and **Step**. **Out**, **Over** and **Step** are disabled now but are enabled whenever a program is open in the window.



Trace Window with Program Menu Popup Displayed

Program Menu Popup

The following options are available on the **Program** menu popup in the Trace window:

Open... Displays an Open File dialog so you can open a program in the Trace window.

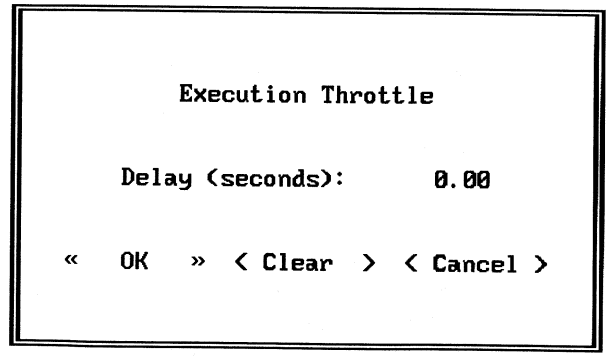
Cancel Cancels execution of a suspended program file.

Line Numbers Displays line numbers in a program. A diamond precedes this option on the menu when line numbers are displayed. You can toggle line numbers on and off by choosing the **Line Numbers** option.

Clear Breakpoints Removes breakpoints from all program files.

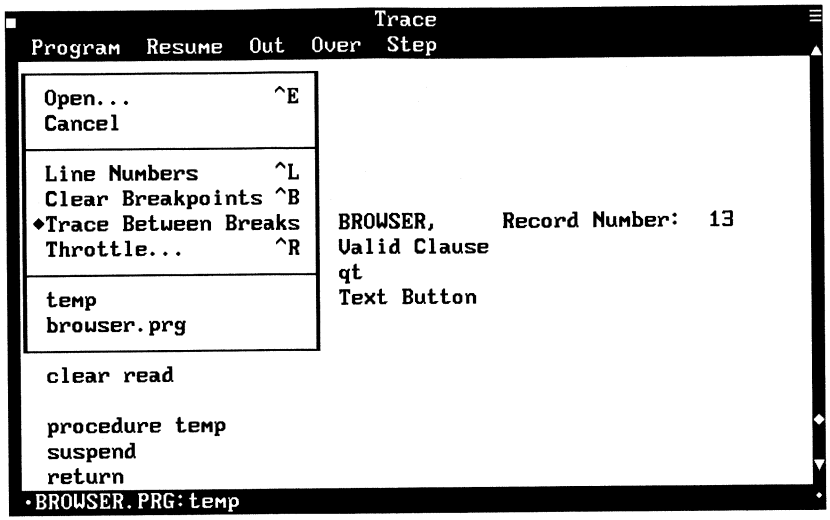
Trace Between Breaks Displays and highlights every line of program code as it is executed. You can tell that **Trace Between Breaks** is chosen when a diamond precedes it. When **Trace Between Breaks** is off, highlighting will remain on the last line executed until another line with a breakpoint is reached.

Throttle... Displays an Execution Throttle dialog so you can specify the execution speed of programs in the Trace window. You can type in the number of seconds you want each line of program code to delay when it executes.



Execution Throttle Dialog

When program execution is suspended in the Trace window, program names, listed in calling sequence, appear at the bottom of the **Program** menu popup.



Program Menu Popup Showing Calling Sequence

The currently executing program is listed first, below **Throttle...** option. The program that called the currently executing program is listed next. In the example above, TEMP is the currently executing program. BROWSER.PRG called TEMP, so BROWSER.PRG appears below TEMP on the popup.

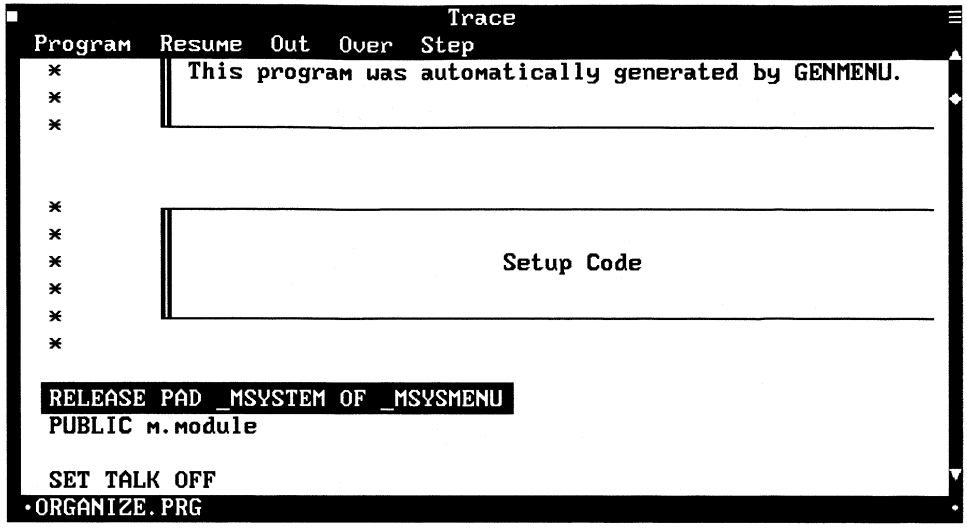
When program execution is suspended, you can choose a program from the bottom of the popup. For example, if you choose BROWSER.PRG, the line in BROWSER.PRG that called TEMP is displayed and highlighted in the Trace window.

Pressing the Home key returns you to the current point of execution in the program.

Do...

To begin program execution in the Trace window, choose **Do...** from the Trace menu bar to display a Do dialog. Select the program file you want to execute, then choose the **Do** push button. The program is displayed and suspended in the Trace window with the first executable line highlighted.

Alternately, you can open a program from the **Program** menu popup, then choose **Do** to begin execution.



Trace Window with Program Execution Suspended

When program execution is suspended, a bullet appears next to the program name at the bottom of the Trace window. **Program**, **Resume**, **Out**, **Over** and **Step** are enabled on the menu bar in the Trace window.

Resume

Choose the **Resume** menu pad to continue program execution at the point where execution was suspended.

Out

Choose the **Out** menu pad to step out of a currently executing program and suspend execution on the first line following the command that called the current program. **Out** resumes program execution but overrides the **Trace Between Breaks** setting.

Over

Choose the **Over** menu pad to step over a called program that you don't want the Trace window to display. If you're on a line that calls another program, **Over** continues program execution, without displaying the executed lines of a called program, to the next statement of the program currently displayed in the Trace window. If you're not on a line that calls another program, **Over** acts like **Step**.

Step

Choose the **Step** menu pad to execute one line of a program. **Step** allows you to step through each line of code in a program one line at a time.

Setting and Removing Breakpoints

If you want to suspend program execution at specific points in a program, you can set breakpoints. Breakpoints can be set when a program is suspended in the Trace window or open in the Trace window. Click with the mouse, press the Spacebar or press Enter anywhere on the desired line to set a breakpoint. A diamond to the left of a line indicates that a breakpoint is set.

If you click with the mouse on a line that *cannot* contain a breakpoint (such as a comment line), a breakpoint is set on the next executable line that can contain a breakpoint.

To remove a breakpoint, click with the mouse, press the Spacebar or press Enter on the line.

Choosing **Clear Breakpoints** from the **Program** menu popup in the Trace window clears breakpoints in *all* of your program files.

Pressing Escape

You can press Escape to interrupt program execution at any time unless you've SET ESCAPE OFF. If you are in a READ or other wait state, Escape will terminate the READ or the wait state. If you're not in a READ or a wait state, execution suspends and the Trace window comes forward (if it is open) with the next executable line highlighted.

When you press Escape with program execution suspended and the Trace window frontmost, an alert appears. You can **Cancel** execution and close the Trace window or **Ignore** the Escape and return to the Trace window.

When the Trace window is frontmost with no program executing or suspended, pressing Escape closes the Trace window.

Copying Text from the Trace Window

When program execution is suspended in the Trace window, you can use **Copy** from the **Edit** menu popup to duplicate lines in your program that are highlighted by FoxPro. **Copy** duplicates the highlighted line and places the copy on the clipboard. You can use **Paste** from the **Edit** menu popup to insert a copy of the clipboard contents into any editing window or the Command window.

Locating Text in the Trace Window

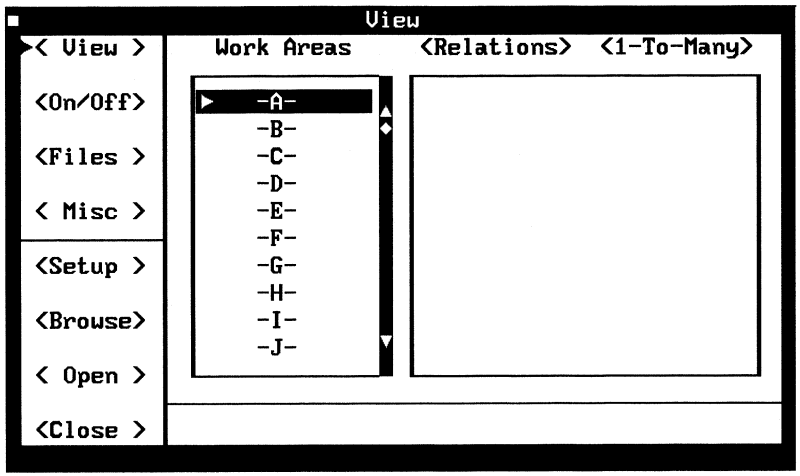
When program execution is suspended in the Trace window, you can use **Find...** from the **Edit** menu popup to search for text in your program code.

For more information about **Copy**, **Paste** and **Find**, refer to the Edit Menu chapter of the FoxPro *User's Guide*.

View

Display the View window

The View window provides you with an easy way to open database files, establish relations and set many FoxPro switches. Whenever you work interactively with FoxPro, think of View as the master control for database operations.



View Window/View Panel

The View window has four panels: View, On/Off, Files and Misc. Each panel can be accessed by choosing the appropriate push button in the View window.

Opening and Closing the View Window

To open the View window, choose **View** from the **Window** menu popup. The View window appears. Now you are ready to work with database files and set FoxPro switches.

When you finish using the View window, do one of the following:

- Press the Esc key.
- Choose **Hide** from the **Window** menu popup.
- Click the close control on the View window.

The View window disappears from the screen.

Using the View Window

The View window is divided into three sections: the push buttons that display panels, the push buttons specific to a particular panel and the panel itself. Four push buttons — **View**, **On/Off**, **Files** and **Misc** — are always located along the upper left side of the window. Choosing any of these push buttons displays the panel with the same name. Even though the appearance of the View window varies each time you choose a panel push button, you can tell that you are still in the same window because the word View remains as the window title.

View Panel

Choose the **View** push button to display the View panel. Four push buttons — **Setup**, **Browse**, **Open** and **Close** — are located at the lower left edge of the View panel. These push buttons control database files in the manner described below.

Setup Displays the Setup dialog. In this dialog, you can decide which index file(s) to use with a database, modify the structure of your database, build a list of available fields, define a filter and specify which format file to use for data input screens. For more information, refer to Setup in the Database Menu chapter of this manual.

Browse Displays the selected database in a Browse window. Whenever a Browse window is frontmost, a **Browse** menu pad is added to the menu bar. The **Browse** menu popup contains options for use with the Browse window. You can examine, edit and append data in a Browse window. For more information, refer to Browse in the Database Menu chapter of this manual.

Open Displays the Open File dialog so you can select the database that will be opened in the work area. If your database is in a different drive or directory, choose the correct drive and directory from the popups. Select the database file from the list and choose **Open**. The View window reappears with the database file name (excluding the .DBF extension) in the Work Areas list.

Close Removes the selected database and any associated files from the current work area. The original work area letter or number reappears.

The Work Areas list contains work areas in which databases can be opened. Initially, the work areas are labeled A-J and 11-25. A triangle marks the selected work area.

Once you open a database, its alias replaces the selected work area letter. This alias is the file name of the database (excluding the .DBF extension), unless otherwise specified. For more information about aliases, refer to the chapter titled Overview of the FoxPro Language in the FoxPro *Language Reference.*

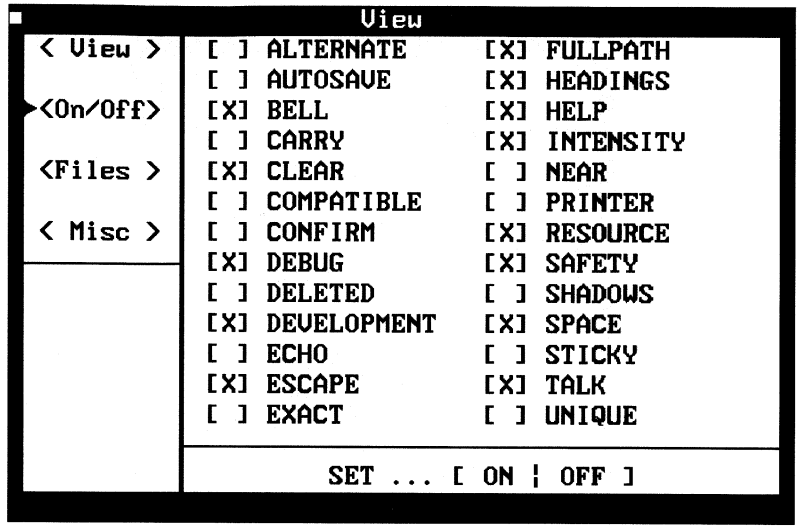


Aliases other than the database name can be manually assigned by opening a database through the Command window or a program file. Refer to USE in the FoxPro *Language Reference.*

The Relations area of the View window displays any relations, or links, that exist between database files in the work areas. There are two methods for setting a relation: (1) based on record number or (2) based on a matching field. For more information about relations, refer to Relating Database Files in the View section of this chapter.

On/Off Panel

Choose the **On/Off** push button to display the On/Off panel of the View window.

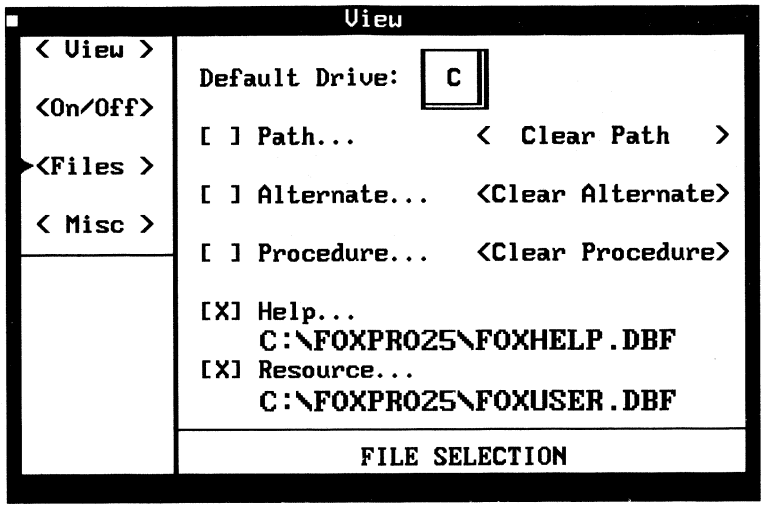


View Window with On/Off Panel

This panel contains 26 different setting controls for FoxPro. Choose a check box to turn a setting on or off. A setting that is on has an X in the check box. For more information about any of these options, refer to SET commands in the FoxPro *Language Reference.*

Files Panel

Choose the **Files** push button to display the Files panel of the View window. In this panel you can change the default drive and set certain default files. Files panel options are described below.



View Window/Files Panel

Default Drive Displays the default drive for all file input and output operations. If you wish to specify a different default drive, choose the drive from this popup. The new default drive is displayed on the popup.

Path... Allows you to specify a directory path for FoxPro to search when a file is not found in the default directory. When you choose the **Path...** check box, a Select Directory dialog appears.

Choose the desired drive, directory and/or subdirectories from the popups and the list. When the path at the top of the dialog is correct, choose **Select**. The path appears in the Files panel. To deactivate this path, choose the **Clear Path** push button.

Alternate... Allows you to specify the file in which screen output will be saved. When you choose the **Alternate...** check box, a Save As dialog appears. Choose a file from the list for use as the alternate file, or type a new file name in the text box. Choose **Open**.

The alternate file name appears in the Files panel. To direct screen output to the alternate file, check the **Alternate** check box in the On/Off panel of the View window. When you are ready to deactivate and close the alternate file, choose the **Clear Alternate** push button.

Procedure... Allows you to specify the procedure file to be searched when executing a program. When you choose **Procedure...**, an Open File dialog appears. Select the desired procedure file from the list and choose **Open**.

The procedure file name appears in the Files panel. To deactivate and close the procedure file, choose **Clear Procedure**.

Help... Allows you to specify the file to display when you choose **Help...** from the **System** menu popup or press F1. By default, this file is FOXHELP.

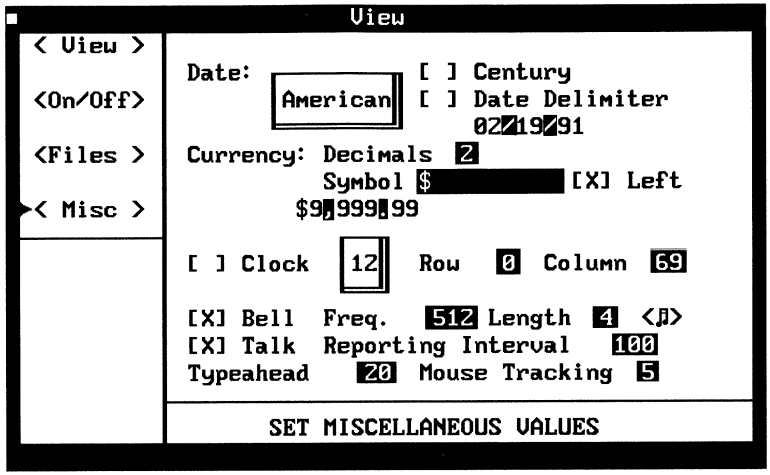
When you choose the **Help...** check box, the Open File dialog appears. Select the desired help file and choose **Open**. The help file name appears in the Files panel. To enable help, you must check the **Help** check box in the On/Off panel of the View window.

Resource... Allows you to specify the resource file for use with FoxPro. This file contains a collection of resource items such as window size and location, text file preference settings, color sets, etc. You may want to create additional resource files to store different FoxPro color schemes.

When you choose **Resource...**, the Open File dialog appears. Select the desired resource file and choose **Open**. The resource file name appears in the Files panel. Unless you want to edit the resource file, you should check the **Resource** check box in the On/Off panel of the View window.

Misc Panel

Choose the **Misc** push button to display the Misc panel of the View window. In this panel, you can set miscellaneous values for FoxPro. These values are explained below.



View Window/Misc Panel

Date Allows you to set the format for date expressions. You can choose from several format options on the **Date** popup. When you choose a format option, its name appears on the popup. The displayed date also changes to the new format.

Two date check boxes are located to the right of the **Date** popup. When **Century** is checked, the complete four-digit year is displayed in all date output. When **Date Delimiter** is checked, you can select the text area in the displayed date and type the delimiter character of your choice.

Currency Allows you to specify the format for monetary data. A value can be entered in **Decimals** to determine the number of places that will follow the decimal point. **Symbol** refers to a string of characters that will precede or follow the currency value, as determined by the **Left** check box.

A sample number is displayed below the currency settings to show how your currency data will appear. If you want to change the commas that appear in currency values, select the text areas of the sample number and type a different character, then press Enter.

Clock Allows you to adjust the system clock. When **Clock** is checked, a 12 or 24 hour clock appears on the screen in the row and column indicated. Use the popup to switch between 12 and 24 hour time. **Row** and **Column** coordinates can also be adjusted (from 0–999) using FoxPro editing techniques.

Bell Allows you to adjust the error tone that your computer emits. Your computer will not emit a tone unless **Bell** is checked in the Misc or the On/Off panel of the View window. **Freq** (19–10000) and **Length** (1–19) of tone can be adjusted. Choose the musical notes to hear the tone frequency and length that you have set.

Talk Allows you to specify whether processing status information is displayed on the screen. When **Talk** is checked, processing status information appears on your screen at the specified **Reporting Interval**. The default **Reporting Interval** is 100, but can be adjusted by entering a different number (from 1–32767).

Typeahead Allows you to specify whether the typeahead buffer is on or off. If you set this number to zero, no characters can be held in the typeahead buffer. If this number is set to a value between 1 and 32,000 (the maximum), 128 characters can be held in the typeahead buffer.

Mouse Tracking Allows you to set how sensitive your pointer will be to movements made with the mouse. When set to 1, the pointer is least sensitive. When set on the maximum of 10, however, the pointer speeds across the screen with the slightest movement of the mouse.

Saving and Restoring Views

It is possible to save the environment settings from the View window to a view (.VUE) file. With the View window frontmost, choose **Save as...** from the **File** menu popup.

A Save As dialog appears. Enter the name of the new .VUE file and choose **Save**. Any environment settings, files, alias names, and established relations from the View window are saved.

To restore a view, choose **Open...** from the **File** menu popup and make sure that **View** appears on the **Type** popup. Select the appropriate .VUE file from the list and choose **Open**. When a view file is opened, the View window appears with its settings the same as when it was saved.

Relating Database Files

The ability to set relations is the power center of FoxPro. A relation is a link between two open database files that is based on a common reference point, such as a field or record number. You create a relation to temporarily connect records from different databases so you can access their information at the same time.

In a relation, one database is the parent database and the other is the child database. The parent database controls the child so that when you move the record pointer (select a record) in the parent database, FoxPro automatically moves the record pointer to the first corresponding record in the child database. If a matching record cannot be found in the child database, the record pointer is moved to the end of the child file.

For example, each record in CUSTOMER.DBF contains a customer identification number and customer address information. Each record in INVOICE.DBF contains a customer identification number and a billing amount. INVOICE.DBF is indexed on the customer identification number. If you set a relation on the customer identification number in INVOICE.DBF, you could select each customer record in CUSTOMER.DBF and see the amount of the customer's bill selected in INVOICE.DBF.

When you set a relation, it doesn't matter if the parent database is in indexed or unindexed form. The child database must be indexed unless you only want to relate the databases by record number.

Relation by Matching Field

When the child database is indexed, the relational expression you create must match the index expression of the child database. FoxPro evaluates the relational expression for the current record in the parent database, then finds the first corresponding record in the child database. In a relation of this sort, the relational expression must be the same data type and field length as the index expression for the child database.

Relation by Record Number

When the child database is unindexed, the relational expression you create *must be numeric* because it will be used to find a record number. If the relational expression is not numeric, the message "Database is not indexed" appears. FoxPro evaluates the relational expression for the current record in the parent database, then locates a corresponding record number in the child database.

Setting Relations

Before you begin to relate databases, make sure that the View panel is displayed. All database files that you want to relate must be open in their own work areas.

From the Work Areas list, select the database that will be the parent database. Choose the **Relations** push button. The name of the parent database appears in the Relations list with an arrow pointing from it.

Now, select the database in the Work Areas list that will be related to the first database — the child database.



If a relation is based on anything except record number, the child database must be indexed on an expression that is the same data type and length as the relational expression.

If the child database is indexed and has the order set, the Expression Builder appears. If a field that the child is ordered on exactly matches a field in the parent database, FoxPro automatically enters that field in the expression box because this is the field upon which your relation is nearly always based. You can change this field or create another expression in the expression box.

If the child database is indexed but the order is not set, a Set Index Order dialog appears so you can specify an order.

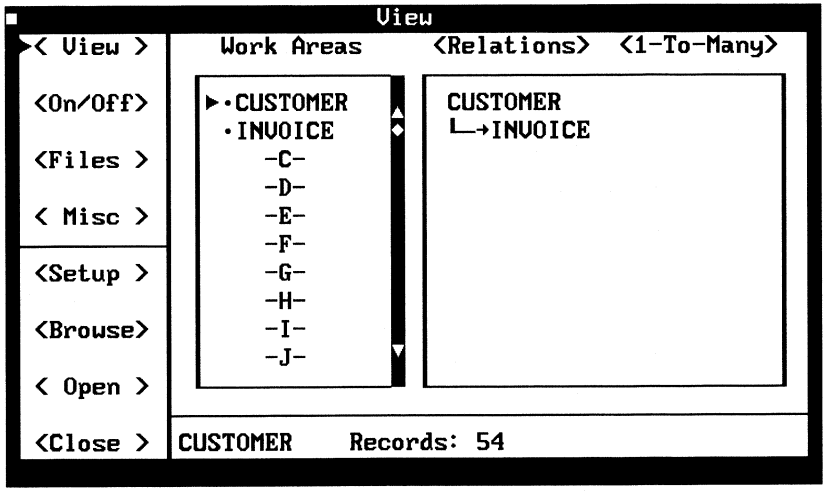
Select the index entry that you want to control the order of your database and choose **OK**.

If the child database is not indexed, FoxPro assumes that you will create a relational expression based on record number.

When you're satisfied with the expression in the expression box, choose **OK**. The View window reappears with the complete relation in the Relations area.

Creating One-To-Many Relationships

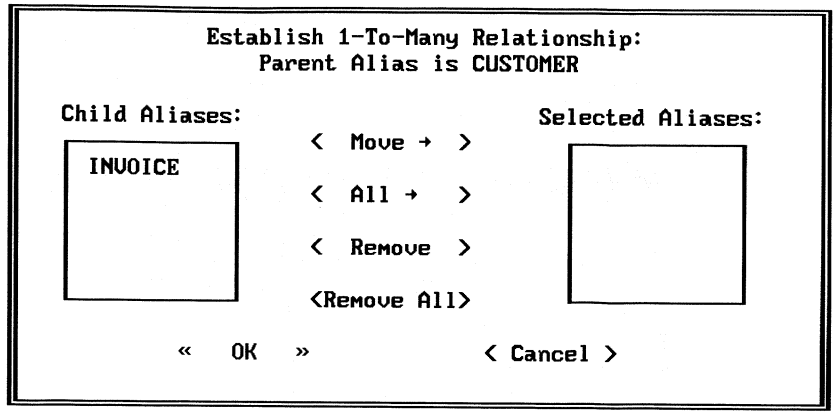
A **1-To-Many** push button appears to the right of the **Relations** push button at the top of the View panel.



View Window with Relation Set

The **1-To-Many** push button is enabled when there is at least one relationship originating from the selected database.

When you choose the **1-To-Many** push button, the 1-To-Many dialog appears so that you can establish a one-to-many relationship.



One-to-Many Dialog

A one-to-many relationship can contain multiple records in the child file for each record in the parent file. When databases involved in a one-to-many relationship are processed, the record pointer remains on the same record in the parent database until all related records in the child database have been processed.

The parent alias is displayed at the top of the 1-To-Many dialog. Child aliases appear in the list on the left side of the dialog. The **Selected Aliases** list will display aliases of all databases currently involved in a one-to-many relationship with the current database.

Six push buttons are located in the 1-To-Many dialog:

Move Copies the selected child alias(es) in the **Child Aliases** list to the **Selected Aliases** list. This push button is disabled unless an alias is selected in the **Child Aliases** list.

All Copies all of the child aliases in the **Child Aliases** list to the **Selected Aliases** list.

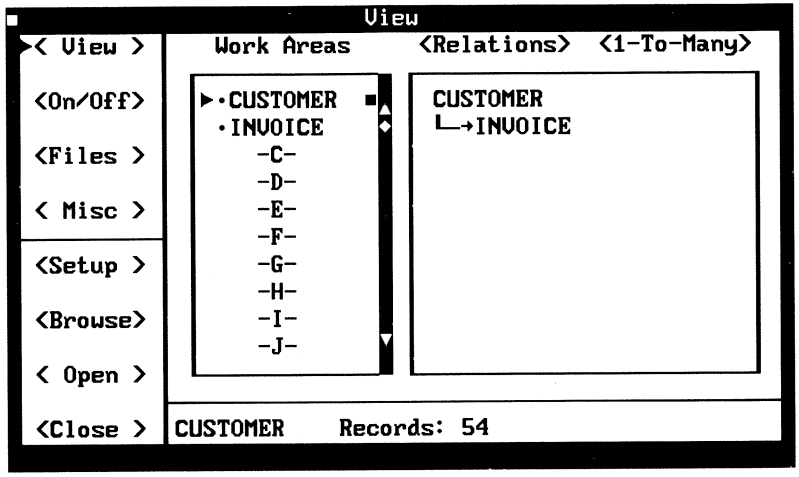
Remove Removes the selected alias(es) from the **Selected Aliases** list. This push button is disabled unless an alias is selected in the **Selected Aliases** list.

Remove All Removes all aliases from the **Selected Aliases** list.

Cancel Exits the 1-To-Many dialog without creating or removing any one-to-many relationship.

OK Confirms the one-to-many relationship among the selected alias(es) and exits the dialog.

A square bullet appears in the work areas list to the right of the parent database when a one-to-many relationship is set.



Picture of View Window with Relation Set

For more information, refer to SET SKIP in the FoxPro *Language Reference.*

Modifying Relations

In the View window, you can modify existing relations between database files. First, make sure the View panel is displayed. To see the existing relation and make modifications:

- With the keyboard, Tab to the Relations area and arrow to the child database. Press the Spacebar.
- With the mouse, click on the child database in the Relations area. The Expression Builder appears.

Change the expression as necessary. When you have established a valid relational expression, choose **OK**.

Removing Relations

In the View window, you can remove relations between database files. First, make sure the View panel is displayed. Choose the child database in the Relations area. The Expression Builder appears. Remove the existing relational expression from the expression box and choose **OK**. The View window reappears and the relation has been removed from the Relations area.

Other Options

List names of all active windows

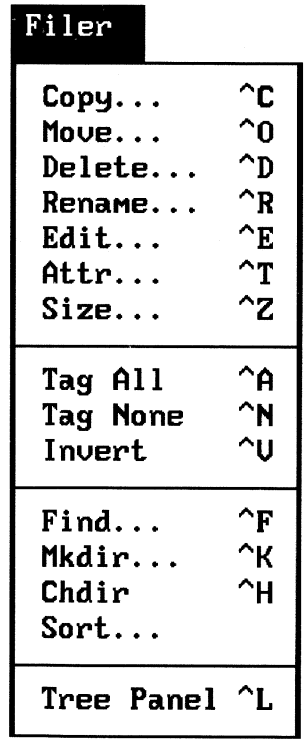
In addition to these options, the names of all open windows appear at the bottom of the **Window** menu popup. The first ten windows at the bottom of the **Window** menu popup have a number hot key, 0–9, which you can use to choose the window name. If an open window is hidden or behind other windows, you can bring it to the front by choosing its name from the **Window** menu popup or pressing the appropriate hot key.

9 Filer Menu

The Filer helps you maintain order on your hard disk. You can copy, move, rename, find, delete and check the size of files. You can also view and change file attributes.

The Filer has two panel. The Files panel is used to manipulate individual files or groups of files. The Tree panel is used for operations on entire directories and their subordinate directories.

To use the Filer, choose **Filer** from the **System** menu popup. The Filer window appears with the Files panel displayed and a **Filer** menu pad is added to the end of the menu bar.

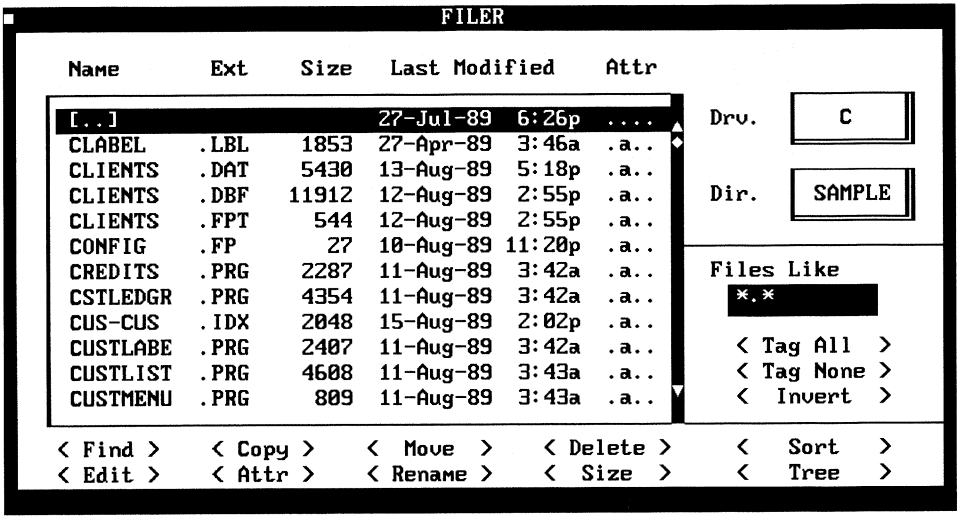


Filer Menu

The **Filer** menu popup contains menu items that correspond to the push buttons in the Files and Tree panels, and a **Panel** option used to toggle back and forth between the two panels. Control key shortcuts exist for most options on the **Filer** menu popup.

Files Panel

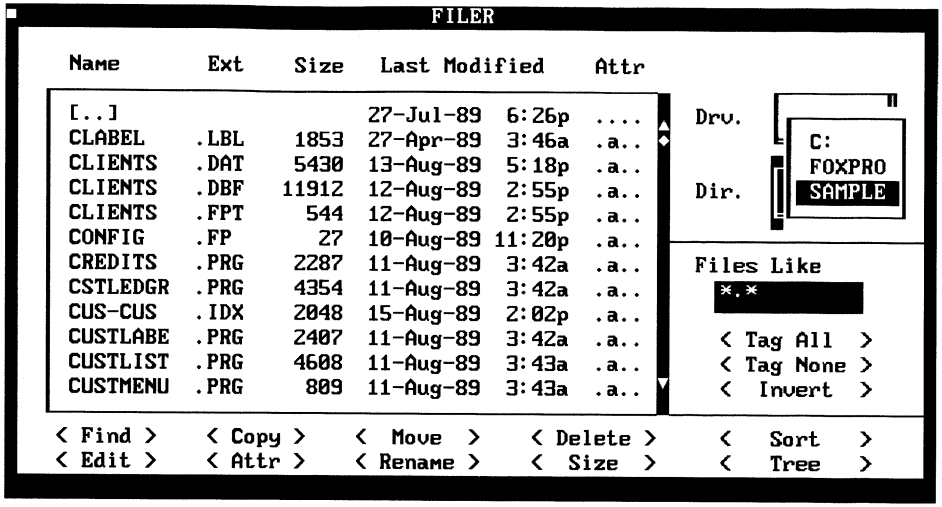
The Files panel contains thirteen push buttons, two popup controls, a text box and a list. A scroll bar appears to the right of the list when it contains more files than can be seen.



Files Panel

Changing Drive and Directory

The popup controls in the upper right portion of the dialog display the current drive and directory.



Files Panel with Directory Popup

You use the **Drive** popup control to change the current drive. When you change drives, the name of the current directory on the new drive appears on the **Directory** popup control. The files and subordinate directories in the list change to reflect the new drive and directory.

The **Directory** popup is used to change directories. You can quickly move up the directory tree structure many directories at a time by choosing options from this popup. When you choose a new directory, the list in the Filer changes to reflect the contents of the new directory.

Besides using the **Directory** popup, you can move up the directory tree structure by choosing the first entry in the list, the parent directory. By choosing **[..]**, you move up the directory tree one parent directory at a time.

To display the files in a subordinate directory, choose the directory name from the list. The list displays all subordinate directories in the new directory, followed by the files in that directory. The name of the new directory appears on the **Directory** popup.

When the list contains only the parent directory symbol ([..]) and file names, you know no subordinate directories are in the current directory.



The parent directory symbol always appears at the top of the list except when the current directory is the root directory.

Files are displayed in the Files panel with the file name, extension, size, the date and time the file was last modified and any attributes assigned to that file. The attributes are Read Only, Archived, Hidden File or System File. For more information on attributes, see the Attributes section later in this chapter.

Limiting File Display

The files displayed in the Filer can be customized/limited by using the Files Like text box to designate files or file types. Enter any legitimate file name or any portion of a file name combined with wildcard characters in the Files Like text box. You can specify more than one by separating the specifications with a semicolon. For example, you could enter `*.EXE;*.TXT;*.BAT`. *Do not* put spaces between each specification. When you press Enter, only the files that meet the Files Like specification are displayed in the list.

By default, the files are displayed in the following order:

1. Directories
2. Alphabetically by file name, then alphabetically by extension.

Tagging Files

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.

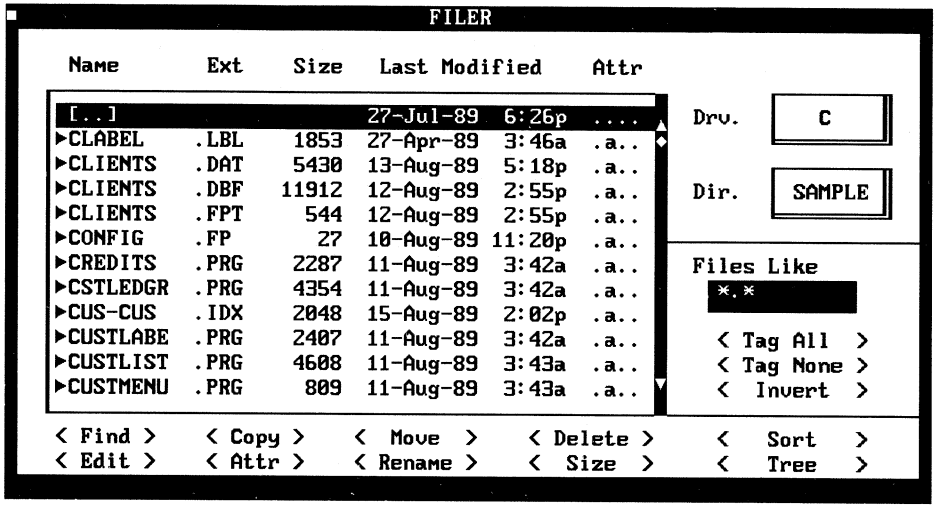
To tag files individually using the keyboard, press Tab until an item in the list is selected. Press the Up/Down Arrows until the desired file is highlighted, then press the Spacebar. To tag multiple files, hold down the Shift key and select the files you wish to tag. While holding down the Shift key, pressing the Spacebar on selected files toggles them between tagged and untagged. To tag multiple consecutive files, tag one file, then hold down the Shift key and press the Up/Down Arrow key.

To tag files individually using a mouse, point to the file name and click. To tag multiple files, hold down the Shift key and select the

files you wish to tag. With the Shift key held down, drag the mouse to tag groups of consecutive files. Holding down the Shift key while clicking on files changes them from tagged to untagged.

Three push buttons are located beneath the Files Like text box: **Tag All**, **Tag None** and **Invert**. The **Filer** menu popup contains options that correspond to these buttons.

Tag All tags all the files in the list. This feature is most useful when you have specified a file type in the Files Like text box. You might want to copy, move or delete all the files of a specific type. Choose this push button to tag them all at once.



Files Panel with Tagged Files

Tag None untags all tagged files in all directories. Use **Tag None** after you perform an action on tagged files to ensure that you don't manipulate them unintentionally.



> **Tag All** only acts on files in the current directory (as displayed in the list). **Tag None** performs a global action. After choosing **Tag None**, no files will be tagged in any directory.

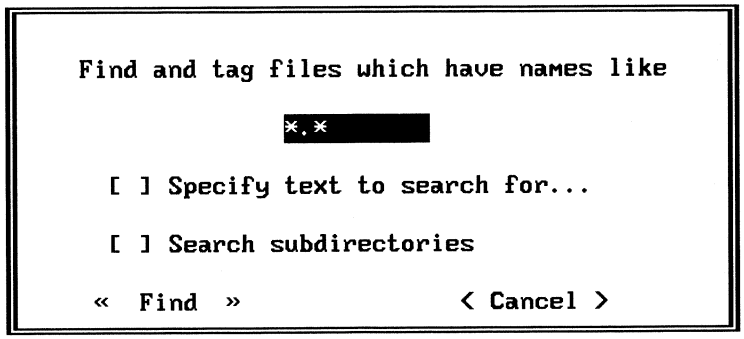
Tagged files in all directories remain tagged until you untag them, change drives, switch to the Tree panel or exit the Filer.

Invert untags all tagged files and tags all untagged files in the currently displayed directory. This is very useful when you want to tag most of the files in a directory. For example, if you want to tag all *except* three files, you would tag the three, then choose **Invert**.

Find Files

Find is used to specify files to be tagged based on the file name and/or the contents of the file. The **Find** option uses two dialogs to locate and tag files.

Find tags files containing specified text in entire directories and their subordinate directories. Choose the **Find** push button or **Find...** from the **Filer** menu popup to bring forward the Find File dialog.

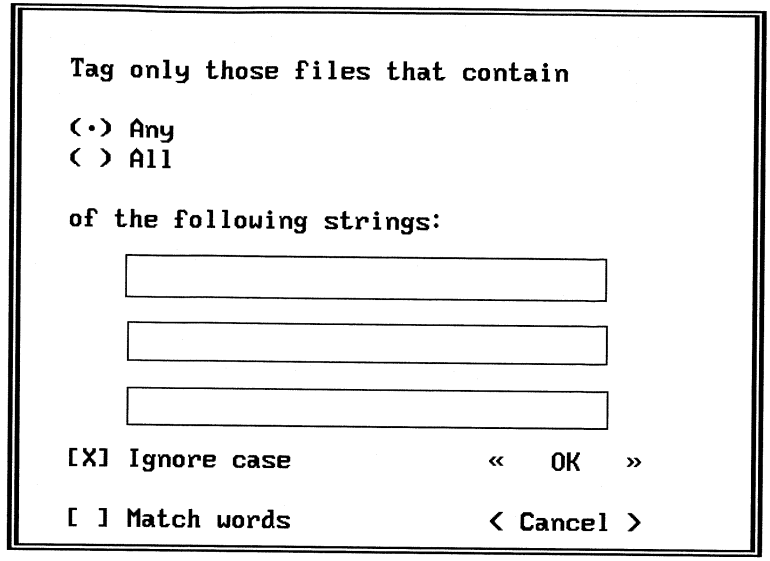


Find File Dialog

In this dialog you specify the file type you want to find by entering the specification in the text box. This text box works the same as the Files Like option in the Files panel. Enter any legitimate file name or any portion of a file name combined with wildcard characters in the text box. You can specify more than one by separating the specifications with a semicolon. For example, you could enter `*.EXE;*.TXT;*.BAT`.

The difference between the find option and the Files Like option is that **Find** displays and tags all files that meet the specification in *all directories on the current drive* if you have instructed it to do so. If the specification is `*.*`, all files will be tagged.

Beneath the text box in the Find Files dialog are two check boxes. Checking the **Specify text to search for...** check box brings forward the Specify Text dialog.



Specify Text Dialog

This dialog has three text boxes in which you enter character strings you want the Filer to locate in the files it searches. Enter up to three strings no longer than 256 characters each. The Filer searches through all the specified files and tags the ones that contain these strings.

Above these text boxes are two radio buttons: **Any** and **All**. If you choose **All**, a file is tagged only if it contains all of the specified strings. If you choose **Any**, a file is tagged if it contains any one of the specified strings.

Two check boxes are located at the bottom of the specify text dialog. **Ignore case** tells the Filer to treat upper- and lower-case letters as if they were identical. If you have entered the string "The Quick Fox", checking **Ignore case** allows the Filer to locate and tag files containing "the quick fox" as well as "The Quick Fox", "THE QUICK FOX", and so on. If this check box is not checked, only files containing "The Quick Fox" are tagged.

Match words tells the Filer to match entire words in the specified string. For example, if you enter the string "can", files containing strings such as "*can*dle", "in*can*descent" and "de*can*ter" are tagged

as well as "can". You must check the **Match words** check box if you only want to tag files containing the exact word "can".

When you have entered the strings and checked the desired options, choose **OK** to return to the Find Files dialog. Another check box in the Find Files dialog is **Search subdirectories**. **Search subdirectories** finds files that meet your specifications in the current directory and all its subdirectories. If this box is not checked, the Filer searches only the current directory that is displayed on the **Dir** popup.

After you enter file specifications and choose the desired options, choose **Find** to begin the search. The Filer begins locating and tagging files. Choose **Cancel** to return to the Files panel without performing any action.

If you want to search parent directories, choose the highest level directory in which you want to begin the search from the **Dir** popup before you choose **Find**.

The **Find** feature can be used to search an entire drive. To search a drive, choose the root directory from the **Directory** popup, then check **Search subdirectories** in the Find dialog and choose **Find**.



If you are searching through many files or large files, **Find** may take some time. The Filer shows you the name of the file being searched and, for large files, the progress through the file.

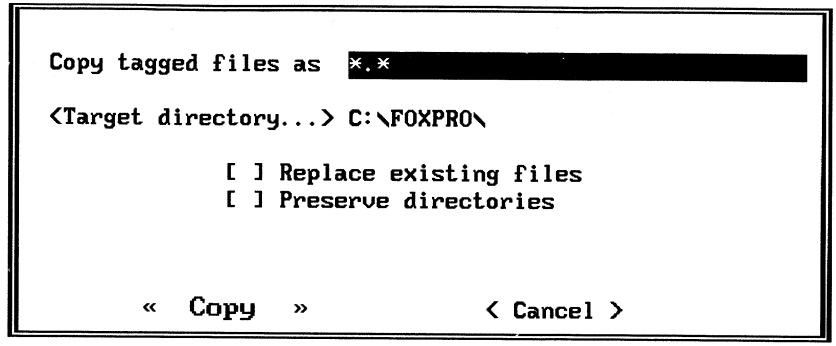
When the Filer finishes searching the files, you are returned to the Files panel. All files that meet your specifications are tagged. Also, when you choose **Edit** in the Filer to open a file tagged with **Find**, the string specified in the first text box of the Find dialog will be highlighted in each file. The string also appears in the text box of the Find dialog accessed through the **Edit** menu popup. You can then use the usual search and replace options to alter the file.

Directories that had files tagged in them during the **Find** are marked with an arrow to the left of the directory name in the list. You can choose a marked directory to see which files have been tagged and untag some, if desired, before you perform a mass operation (copy, move, delete, edit) on all the tagged files in all the directories.

Copy Files

Choose the **Copy** push button or **Copy...** from the **Filer** menu popup to copy tagged file(s) to a new location (the target directory) without disturbing the files in their original location. This option also allows you to rename the files in a mass operation during the **Copy** process.

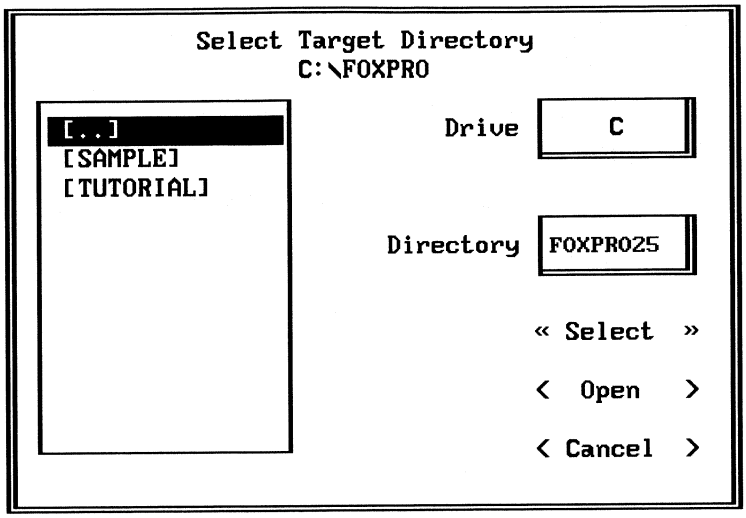
Choosing **Copy** brings forward the Copy Files dialog.



Copy Files Dialog

In this dialog you specify the output name of the file(s) in the first text box, and then designate the target directory to which the file(s) are to be copied. The default setting in the output file text box is *.*. This specifies that all tagged files will be copied to the target directory without changing their names. By entering wildcard characters in this text box, you can rename all the tagged files in one operation during the copy process. For example, if you had tagged all the text (.TXT) files and wanted to copy them with the extension .OLD, you would enter *.OLD in the output file name text box. All the tagged files would be copied to the specified target directory and renamed with an .OLD extension in one operation.

You specify the target directory by entering the drive and directory in the text box next to **Target Directory...**, or by choosing the **Target Directory...** push button and using the Target Directory dialog.



Target Directory Dialog

You can change drives and directories by choosing the desired drive and directory from the appropriate popups. The **Directory** popup displays the name of the current directory and the list displays the subordinate directories in the current directory of the current drive.

If you don't change drives, the **Directory** popup displays all the parent directories of the current directory, and the list displays all the subordinate directories. Choose the drive and directory to which you want the tagged file(s) copied. Then choose the **Select** push button to return to the Copy Files dialog. The target directory now appears in the text box.



If you enter a directory that does not exist, the Filer will create the directory on the specified drive before copying the files to that directory.

Two check boxes are located in the Copy Files dialog: **Replace existing files** and **Preserve directories**. When you check **Preserve directories**, the directory structure is copied as well as the files themselves. The complete structure will be copied through the lowest directory in the tree (the one farthest from the root) that contains all tagged subdirectories. For an extended example of preserve directories, see Copy Directory later in this chapter.

Check **Replace existing files** to overwrite files in the target directory having the same name as files being copied. Choosing this option will not overwrite directories. If a directory by the same name exists in the target, the files that correspond to that directory will be copied. When you are ready to copy, choose **Copy**.

If **Replace existing files** is not checked and a file with the same name exists in the target, an alert appears asking if you want to overwrite the file. Choose **Yes** to overwrite or **No** to skip the file and continue the operation. Choosing **Cancel** returns you to the Files panel.

If you enter an invalid file name, an alert comes forward asking if you want to continue. Choose **Yes** to skip the currently displayed file and continue the copy operation. Choose **No** to halt the operation and return to the Files panel. Files that are currently open cannot be tagged or copied.

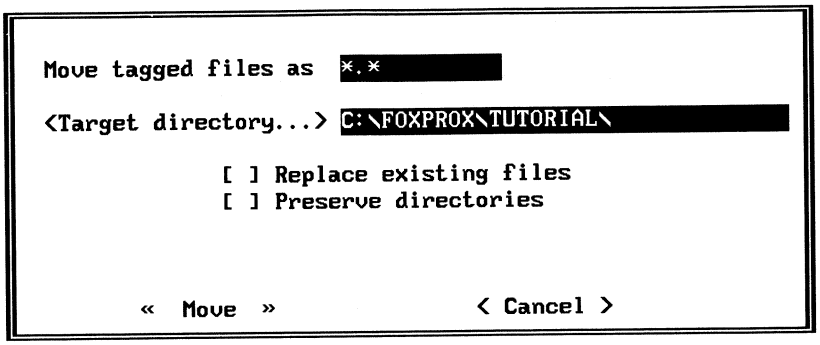


Files that have been copied remain tagged in the original directories but do not appear tagged in the target directory. Remember, if you perform further operations, those operations are performed on all tagged files in all directories. This is very important to remember when you use the Filer to delete files.

Move Files

Move functions exactly the same way as **Copy** except that it deletes the original file immediately after copying it to the target directory.

When you choose the **Move** push button or **Move...** from the **Filer** menu popup, the Move Files dialog appears.



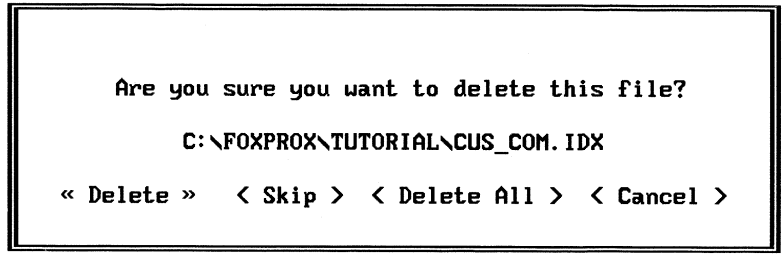
Move Files Dialog

This dialog is the same as the Copy Files dialog. For information on specifying an output file name or designating a target directory in which to move files, see Copy Files earlier in this chapter.

When you are satisfied with your settings in the Move Files dialog, choose **Move**.

Delete Files

Delete can quickly free up large areas of disk space by erasing unwanted files, either individually or in groups. You can specify files for deletion by tagging them individually by directory, or by tagging groups of files in single or multiple directories using the various options for file specification (**Files Like**, **Find**, **Sort**). When you have tagged the desired file(s), choose the **Delete** push button or **Delete...** from the **Filer** menu popup. The Delete Files dialog appears.



Delete Files Dialog

The name of the first tagged file appears, along with four push buttons: **Delete**, **Skip**, **Delete All** and **Cancel**.

Choose **Delete** to erase only the displayed file from the disk. If more files are tagged, the next file appears in the Delete Files dialog. You can confirm the deletion or skip the deletion of the file.

Choose **Skip** to pass over the displayed file without deleting it.

Delete All bypasses the confirmation function of this dialog and deletes all the files that are tagged. This is a quick way to erase files and free disk space, but make sure that only the files you want to delete are tagged.



Delete All erases all tagged files across all directories, even those that aren't visible in the current Files panel display.

The name of each file appears as it is deleted. In most cases, the names flash by so quickly that you aren't able to read them. If you suddenly see file names that you didn't want to delete, press Escape to stop deleting. Any files that already appeared in the dialog are lost.



Make backups of important files frequently, especially before massive delete operations.

Choosing **Cancel** before or between individual delete operations returns you to the Files panel.

Edit Files

Choose the **Edit** push button or **Edit...** from the **Filer** menu popup to open text editing windows for all tagged files. The number of files you can open is limited only by available memory and the MS-DOS FILES = parameter. If you have numerous tagged files you may exhaust available memory or MS-DOS channels. In this case, an error message appears. Before you can continue, you must return to the Files panel and untag some of the files.

Once the editing windows are open, you can cut, copy and paste text among windows to alter programs and text files, or you can position the cursor at any point in the file and enter new text or code.

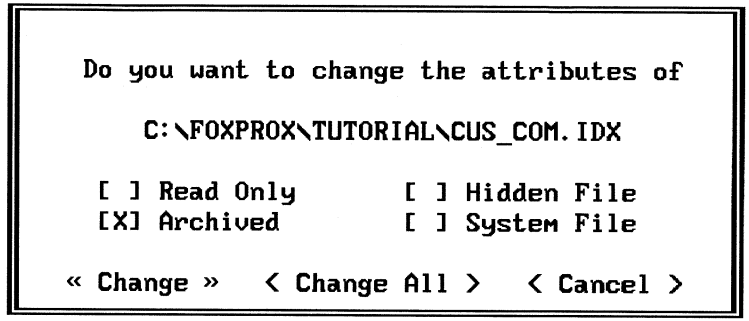
If you choose **Edit** to open files that have been tagged by searching for strings with the **Find** option of the Filer, the first occurrence of the first specified string (from the Specify Text dialog) will appear highlighted in the editing windows when they are opened. The string will also appear in the Find text box of the Find dialog accessed through the **Edit** menu. Use the usual editing techniques to find and replace text with this dialog.

For information on the FoxPro text editor, refer to the Interface Basics chapter of this manual.

File Attributes

In the Files panel, the list displays the MS-DOS attributes of each file. These are switches that can be turned on or off to change the status of a file in specific ways.

You can change the attributes of files either individually or in groups. After you tag the files you want to change, choose the **Attr** push button or **Attr...** from the **Filer** menu popup. The Attributes dialog appears.



Attributes Dialog

This dialog displays the name of the first tagged file and the attributes for that file. The first letter of each attribute corresponds to the letters displayed in the attributes column of the list in the Files panel. Attributes are described below.

Read Only (r) A file with a read only (r) attribute can be read but cannot be modified. **Read Only** protects the file from accidental deletion or modification.

To assign this attribute, check the **Read Only** check box.

You can overwrite a **Read Only** file in the Filer although you are prompted for confirmation first. The Filer cannot delete, move or rename a **Read Only** file.

Archived (a) This attribute signifies that the file has been modified or newly created. Many backup programs back up only files that have the Archived attribute. After the files are backed up, the **Archived** attribute is removed.

To assign this attribute, check the **Archived** check box.

System File (s) This attribute classifies the file as a system file. DOS operating files are protected with the **System File** attribute. System files are in a specific physical position on the disk and should not be moved. The Filer does not let you move, delete, rename or overwrite a file with the **System File** attribute set on.

To assign this attribute, check the **System File** check box.

Hidden File (h) This attribute hides the file so that it does not appear in an MS-DOS directory listing even though it is on the disk. Filer does not let you move, delete, rename or overwrite a file with the **Hidden File** attribute.

To assign this attribute, check the **Hidden File** check box.

Changing File Attributes

When the desired attributes are checked in the Attributes dialog, choose **Change** to assign attributes to the file displayed in the Attributes dialog. The attributes are assigned and the next tagged file appears so you can assign attributes to it.

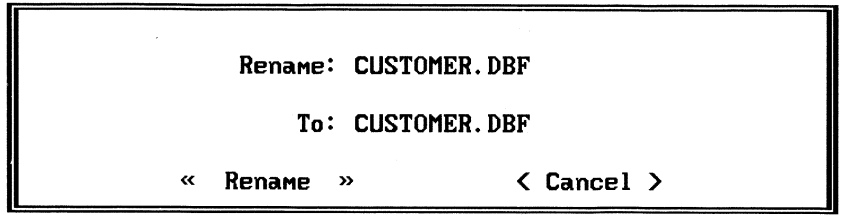
You can alter the attribute settings file by file, or you can change all the tagged files in one operation by choosing the **Change All** push button. Like **Delete All**, this operation goes through all the tagged files very quickly and gives them all the same attributes that you have selected. Remember that when you choose **Change All**, all tagged files (even those not in the currently displayed directory) are affected by the operation. To stop a **Change All** operation once it begins, press Escape. This stops the **Change All** operation, but any files already changed remain changed.

Choosing **Cancel** before you begin an operation returns you to the Files panel.

Rename Files

Renaming files is accomplished quickly and easily using **Rename**.

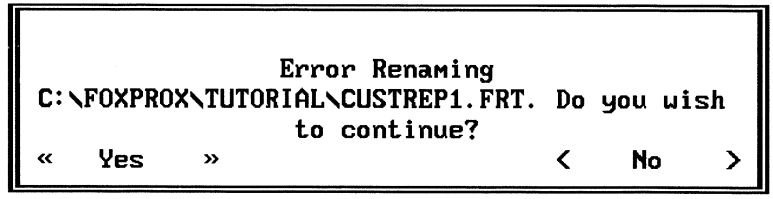
Choose the **Rename** push button or **Rename...** from the **Filer** menu popup to bring forward the Rename Files dialog.



Rename Files Dialog

When you rename a file, the new name is usually similar to the original name. Therefore, the current file name appears by default in the text box. You change the name in the text box by editing the old name or entering a new name. Choose **Rename** when you are ready to rename the file.

If a file already exists with the new name you specified, an error message appears.

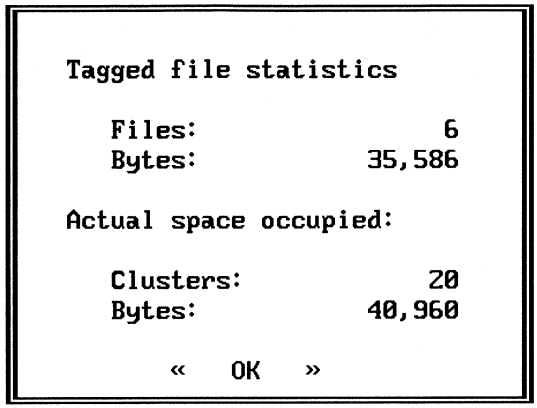


Choose **Yes** to leave this file name unchanged and skip to the next tagged file. Choose **No** to halt the operation and return to the Files panel. If you choose **Yes** when you are on the last tagged file or when only one file is tagged, you will automatically return to the Files panel.

Choosing **Rename** without changing the name of the file in the text box has the same effect as skipping that file.

File Size

The Files panel displays the size of tagged files in bytes. When you are using the Filer to move or delete files to make room on your disk, you want to know how much space the operation actually frees up. Choose the **Size** push button or **Size...** from the **Filer** menu popup to get this information.



Size Dialog

Size provides you with information about the files you have tagged on your disk. The information in the Size dialog reflects files tagged in all directories, not just the directory currently displayed in the Files panel.

The first line of this dialog displays the number of files you have tagged and the second line displays the number of bytes those files contain.



Just adding the bytes together does not provide you with the amount of space those files actually occupy on your disk. Disk space is allocated to files in units called *clusters*. The size of a cluster depends on your particular system.

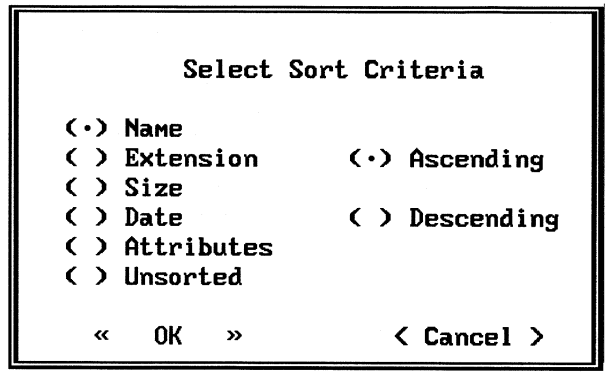
For example, if the cluster size on your system is 2048 bytes, MS-DOS allocates at least 2048 bytes for every file. A file could actually contain only 73 bytes, but DOS reserves 2048 bytes. Therefore, the actual number of bytes the files occupy on the disk could be much greater than the number of bytes displayed in the top portion of the dialog.

The lower portion of the dialog displays the actual number of clusters occupied by the tagged files. This number is then multiplied by the cluster size of your system. The outcome is the actual space occupied in bytes.

Sort Files

To change the order of the files in the list, choose the **Sort** push button or **Sort...** from the **Filer** menu popup. The Sort Files dialog appears. You can change the order with or without specifying a Files Like entry.

The radio buttons in this dialog allow you to change the sort sequence of the files and directories in the list. By default, the **Ascending** and **Name** radio buttons are chosen.



Sort Files Dialog

Choosing the radio buttons in this dialog will display the files in the following sort order:

Sort Files Dialog Radio Buttons	
Sort Order	**Display**
Name	Alphabetical Order: Ascending – A - Z Descending – Z - A
Extension	Alphabetical Order: Ascending – A - Z Descending – Z - A
Size	Size Order (in bytes) Ascending – smallest to largest Descending – largest to smallest
Date	Date Order: Ascending – oldest to most recent Descending – most recent to oldest
Attributes	Attribute Order: Ascending – r,a,s,h Descending – h,s,a,r
Unsorted	DOS Order

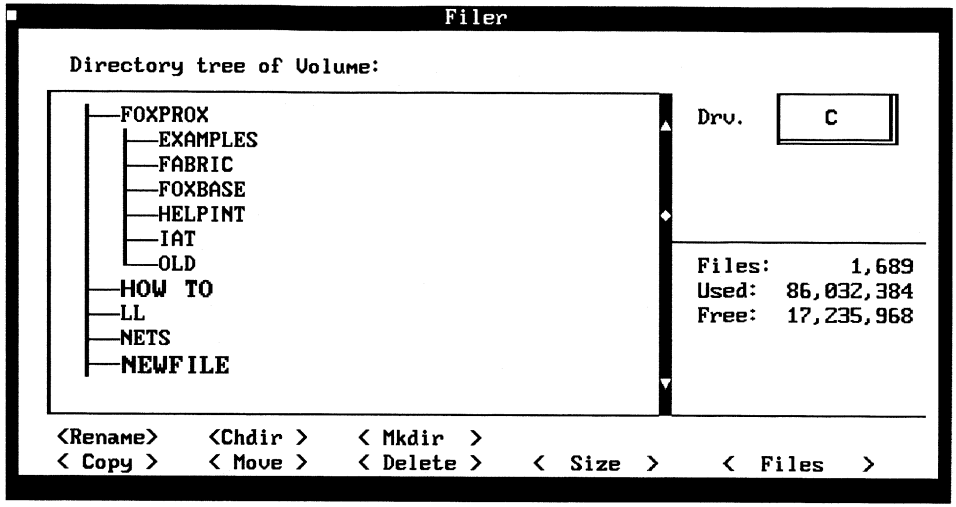
Once you have chosen the desired sort options, choose **OK**. The files are displayed in the sort order you chose. Choose **Cancel** to exit the Sort Files dialog without changing the order of the files.

Display Tree Panel

Tree displays the Tree panel of the Filer. The Tree panel is designed to perform some of the same functions that can be performed in the Files panel, but it performs them on entire directories and all the files they contain.

Tree Panel

In the Tree panel you can copy, move and/or delete entire directory structures with ease — simply choose a push button or menu option and complete a dialog. This panel also allows you to rename, create, change and determine the size of directories.



Tree Panel

Some of these operations are the same operations you can perform in the Files panel except that in the Tree panel, the actions are performed on all the files located in those directories.



Use extreme caution when performing operations in this panel. It is best to back up before deleting entire directories so you can restore the directories from an alternate location if you accidentally delete them.

Choosing a Drive

When the Tree panel is first displayed, the list shows the directories and subdirectories for the current drive. The root directory is at the top of the list. If more directories are present than you can see in the window, scroll with the vertical scroll bar or use the Up/Down Arrows on the keyboard.

To the right of the list is a popup that displays the current drive. To change drives, choose the desired drive from the popup. The list changes to reflect the directory structure on the specified drive.

Beneath this popup is an area that displays the number of files on that drive and the space those files occupy. It also displays the remaining space on the current drive.

At the bottom of the panel are push buttons that bring forward dialogs and perform actions, just as they did in the Files panel. Options on the **Filer** menu popup are activated and deactivated to reflect the push buttons and available options in this panel.

Any time you want to leave the Filer from the Files panel or the Tree panel, press Escape or choose **Close** from the **File** menu popup. If you have a mouse, you can click the close box.

Tagging Directories

You choose the directories you wish to manipulate in much the same way that you chose the files you wanted to alter in the Files panel — you tag them. Keep in mind that when you tag a directory, all the files in that directory are tagged as well. Any actions you specify will be performed on all tagged directories and all the files located in those directories.

To tag directories individually using the keyboard, press Tab until the list is selected. Press the Up/Down Arrows until the desired directory is highlighted, then press the Spacebar. A triangle appears in the list to the left of the selected directory. To tag multiple directories, hold down the Shift key and select the files you wish to tag. While holding down the Shift key, you can press the Spacebar on selected files to change them from tagged and untagged.

To tag directories individually using a mouse, point to the directory name and click. To tag multiple directories, hold down the Shift key and select the directories you wish to tag. While holding down the Shift key, you can click on directories to toggle them between tagged and untagged.

With the Shift key held down, drag the mouse to tag groups of consecutive directories.

To tag groups of consecutive directories with the keyboard, tag a file, then hold down the Shift key while pressing the Up or Down Arrow key.

You can tag and untag directories as many times as you like without altering them in any way. No changes are made to any directories until you choose a push button to invoke an action.

When the desired directories are tagged, choose the appropriate push button at the bottom of the dialog or choose an option from the **Filer** menu popup.

Rename Directory

Choose the **Rename** push button or **Rename...** from the **Filer** menu popup to bring forward the Rename Directory dialog. This dialog displays the name of the tagged directory. Beneath the name is a text box in which you enter the new name. Choose **Rename** when you are ready to rename the directory, or choose **Cancel** to return to the Tree panel without making any changes.

If multiple directories are tagged, the first directory in the tree will be renamed first. When you choose **Rename** and rename a directory, the next tagged directory in the tree is displayed in the text box. This continues until all the tagged directories have been renamed.

When you rename a directory, none of the files in the directory are altered. Only the name of the directory changes. What may also change is the position of the directory in the tree. Because the tree is organized alphabetically, changing the directory name will move it to the corresponding location in this order. The directory will not, however, leave the parent directory in which it is currently located. You can only *rename* the directory with this dialog — you cannot change the path name.

When renaming directories, the new name must be a valid name according to standard MS-DOS conventions (maximum 8 characters with an extension of up to 3 characters). If you enter an invalid name, an error message appears.

If the root directory of a drive is tagged when **Rename** is chosen, then the drive's volume label can be renamed.

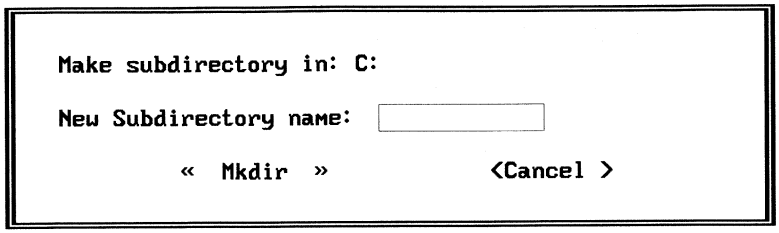
Change Directory

The **Chdir** option is a convenient way to change the current working directory so you can issue commands and open files without entering entire paths in the Command window. The directory specified with this action becomes the default directory where FoxPro will look for files that are not specified with a path.

The current directory is designated by a bullet in the far left column. To change the current working directory, simply tag the desired directory and choose the **Chdir** push button or menu option. The bullet appears next to the new current directory.

Make Directory

To make new directories, tag the directories that will be the parents to the new directories and choose the **Mkdir** push button or **Mkdir...** from the **Filer** menu popup. A Make Directory dialog appears so you can type the name of the new directory in a text box.



Make Directory Dialog

Enter a valid name (use the standard MS-DOS conventions for naming directories) and choose **Mkdir**. The new directory is inserted in the appropriate place among the other subdirectories of the parent you have specified.

If you enter an invalid name, an error message similar to the one displayed in the Rename Directory dialog will appear. Choose **Yes** to leave this directory unchanged and continue making new subdirectories under other tagged directories. Choose **No** to cancel the operation and return to the Tree panel. If no other directories are tagged, you will return to the Tree panel automatically.

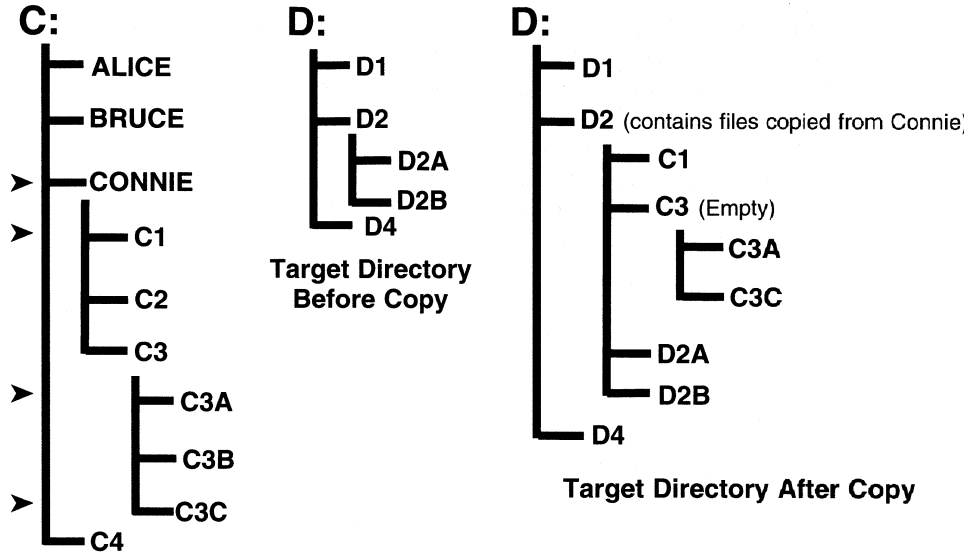
Copy Directory

When you choose the **Copy** push button or **Copy...** from the **Filer** menu popup, the Copy Directory dialog appears. This dialog is similar to the Copy Files dialog in the Files panel. You can enter the target drive and directory in which to copy the tagged directories, or you can choose the **Target Directory...** push button and choose a drive and directory in the Target Directory dialog. For information on the Target Directory dialog, see Copy Files in this chapter.

When you copy directories, you have the option of preserving the directory structure or performing a *flat copy*. When a flat copy is performed, all the files in all the tagged directories are copied to one single directory. The directory structure is not preserved.

When you preserve the structure, the directory structure is copied as well as the files themselves. The complete structure will be copied up to the lowest directory in the tree (the one farthest from the root) that contains all the tagged subdirectories.

In the following example, directories that are tagged are designated with a triangle. The target directory is D:\D2. **Preserve directories** is checked.



The target directory, D2, will contain its original files and all the files from directory CONNIE (which is tagged). CONNIE is the farthest directory in the tree (from the root) that contains all the tagged subdirectories. Directory C1 is created as a subdirectory of D2 and all its files are copied to that directory. Because directory C3 (which is not tagged) is the parent of C3A and C3C (which are tagged), C3 is also created as a subdirectory of D2, but the files in C3 are not copied. C3A and C3C are created off of C3 and all their files are copied into their respective directories.

The Copy Directory dialog in the Tree panel contains the same **Replace existing files** check box as the Copy Files dialog. If **Replace existing files** is not checked and a file with the same name exists in the target, an alert appears asking if you want to overwrite the file. Choose **Yes** to overwrite or **No** skip the file and continue the copy operation. Choosing **Cancel** returns you to the Tree panel. If **Replace existing files** is checked, the files are overwritten without confirmation.

Files that are currently open cannot be copied. If you copy a directory with files that are currently open, the open files will not be copied.

Move Directory

Move acts identically to **Copy** except that the files and directories are deleted from one location as they are moved to the new one. The same options that apply to **Copy** apply to **Move**.

If you move a directory structure but have not tagged all the subdirectories in the structure, any parent directories with subdirectories remaining in the original location will not be *moved* — they will only be *copied*. Because **Move** is actually a **Copy** and **Delete** combination, the Filer does not delete a directory in which other untagged subdirectories are located. The files in the tagged directory are moved and all the tagged subdirectories and the files in them are moved, but the parent directory itself remains in its present location if it contains untagged subdirectories.

As with **Copy**, if you try to move a directory with files that are currently open, those files will not be moved and the directory itself will be copied instead of moved. The open files remain in their present directory in its present location.

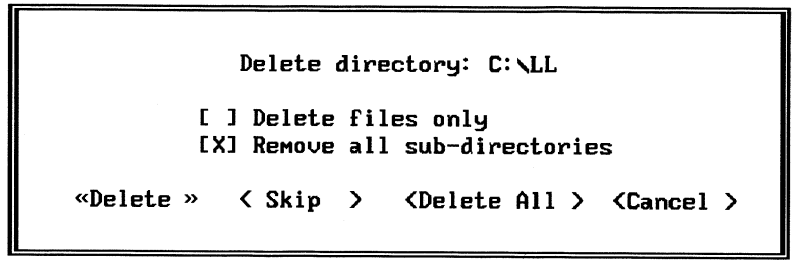
When you **Move** a directory to a new location on the same drive, you are actually performing an extended rename operation, just as if you were moving files to a new location on the same drive. This operation is much faster than moving the directories (to other

drives) because they are not being copied and deleted, they are being renamed.

Delete Directory

The **Delete** push button and the **Delete** menu option should be used with extreme caution. When working in the Files panel, you have the option of confirming each file as it is deleted, as well as choosing **Delete All** to perform the operation quickly. The Tree panel gives you these same options, but with directories instead of files.

After tagging the desired directories, choose the **Delete** push button or choose **Delete** from the **Filer** menu popup to bring forward the Delete Directory dialog.



Delete Directory Dialog

The name of the first tagged directory in the tree appears in the dialog, along with two check boxes — **Delete files only** and **Remove all sub-directories**.

When **Delete files only** is checked, the files will be removed from the disk, but the directory structure will remain intact. When **Remove all sub-directories** is checked, you need only tag the parent directory. The parent and all its subdirectories will be deleted. To remove specific subdirectories, tag each directory individually as described earlier in this chapter and make sure **Remove all sub-directories** is not checked.

As in the Files panel, you can choose **Delete** to remove a tagged directory and all the files it contains. The next tagged directory will then be displayed. Continue choosing **Delete** until all the desired directories are removed.

If a directory appears that you don't want to delete but you still want to continue the operation, choose **Skip**. The directory will remain unchanged and the next tagged directory will be displayed in the dialog. To halt the operation without deleting any additional directories, choose **Cancel**.

In the Delete Directory dialog, you only see the names of the directories, not the names of the files in those directories. Remember that all the files are deleted along with the directory.

This dialog, like the Delete Files dialog in the Files panel, also has a **Delete All** option. When you choose this option, a final confirmation/warning message appears. This message asks, "Are sure you want to do this?" If you choose **Yes**, all the tagged directories and all the files in those directories are removed from your disk in one operation. There will be no other confirmation prompts after this point.



Be very careful when deleting in the Tree panel. As stated earlier, it is best to back up all files to an alternate location (floppy disk, tape, network) before deleting them from your disk.

Directory Size

When a directory is tagged and you choose the **Size** push button or choose **Size** from the **Filer** menu popup, the Size dialog appears. The Size dialog is the same as the Size dialog in the Files panel. This dialog displays the number of files in the tagged directory(s) as well as the size of the tagged files in bytes and clusters. For more information on this dialog, see File Size in this chapter.

Display Files Panel

When you choose the **Files** push button or choose **File Panel** from the **Filer** menu popup, you are returned to the Files panel of the Filer. The features and options in the Files panel are described earlier in this chapter.

10 Introduction to FoxPro Power Tools

This chapter introduces you to the FoxPro power tools. FoxPro power tools automate the construction of user interfaces, the retrieval and display of information, the gathering of application components from various locations into an .APP or an .EXE, and the updating of applications when components change.

The power tools available in FoxPro are:

- Project Manager
- Screen Builder
- Menu Builder
- Relational Query By Example (RQBE)
- Report Writer
- Label Designer

Power tools make it easy for you to design screens, menus, queries, reports and labels without programming — then FoxPro generates the code needed to include these elements in your applications. When you want to modify an interface element, simply make adjustments through the interface then regenerate the code. You never need to look at the associated code for an interface element.

You combine interface and other types of elements for each application into a project. A project manages the interrelations between the interface elements and ensures that the pieces are up-to-date when you are ready to build the application.

For additional information about any power tool, refer to the appropriate chapters in this manual and in the FoxPro *Developer's Guide*.

FoxPro Projects

A project is the central mechanism used to unify and coordinate the elements of a FoxPro application. Creating a project is usually the first step in the process of developing a FoxPro application. A FoxPro project:

Remembers the location of every file it contains.
A project keeps track of the location of all programs, screens, reports, etc., that comprise an application. This makes it very convenient to organize programs, screens and other components in directories according to function, subsystem, or other appropriate category. This also makes it easy to maintain an application.

Accesses prewritten programs and interface components easily.
Because projects permit application components to be scattered across many directories, they also make it easy to access libraries of prewritten program elements (like control panels, browsers, etc.) that are stored in a common directory and used by many applications.

Stores object code.
Object .FXP code is stored in the project itself (in memo fields). This reduces clutter on your disk caused by saving individual .FXPs for each compiled version of a program.

Locates and assembles referenced files.
When you build a project, FoxPro automatically locates and gathers all components of the application. To create a project from an existing application, just add the startup program for the application and rebuild the project. All referenced programs, screens, menus, reports, queries, labels and libraries are automatically incorporated in the project.

Tracks current versions of files.
When you build a project, FoxPro checks that the object code stored in the project is up to date. If it isn't, FoxPro recompiles programs, regenerates and recompiles screens and menus, etc. This project feature is similar to "make" utilities with which you may be familiar.

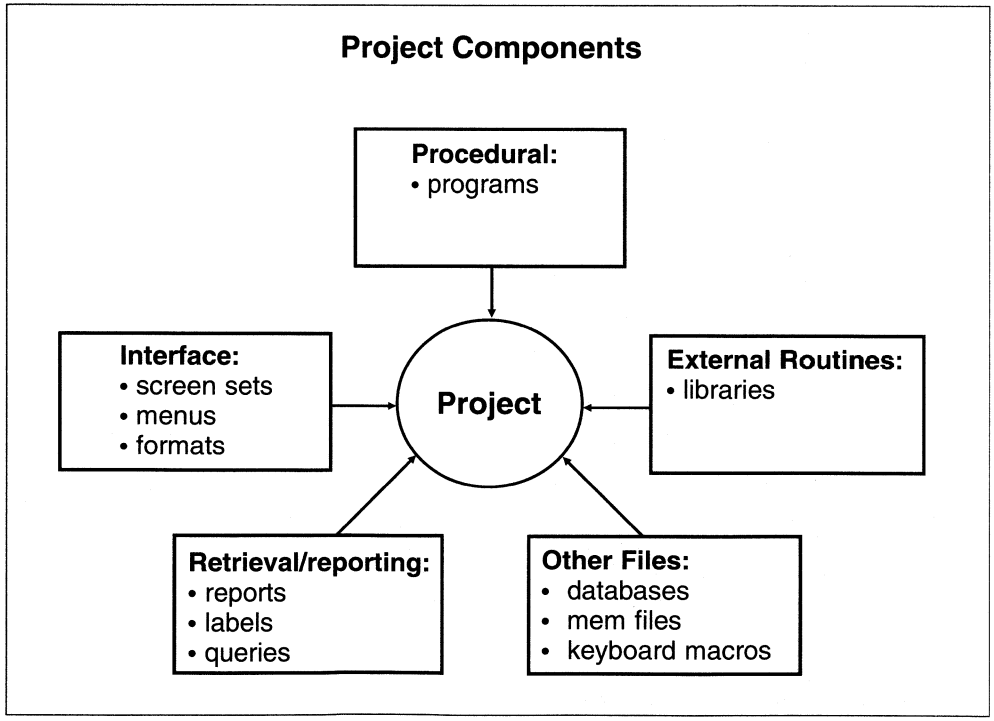
Streamlines distribution.
When an application or an .EXE is generated from a project, all the elements of the application are gathered together into a single .APP or .EXE file. This makes distribution of an application particularly convenient.

Project Contents

All the components of an application are coordinated by a project. FoxPro projects can contain the following components: programs, screen sets (containing one or more screens), menus, formats, queries, reports, labels and libraries.

The components can be grouped according to function:

- Procedural: programs
- Interface: screen sets, menus, formats
- Data Retrieval/Reporting: reports, labels, queries
- External API Routines: libraries
- Other components: databases, mem files, keyboard macros



Procedural Components

Programs are procedural components that can be included in a project. In a project, you can include individual programs as well as programs that call other programs.

Interface Components

Interface components that can be included in a project are screen sets, menus and formats.

The Screen Builder allows you to create screen sets consisting of one or more screens. Each individual screen is a functionally complete interactive element that can be part of a larger functional group of control panels and full screen displays. You design and modify individual screens in a Screen Design window, then combine them into a screen set and let FoxPro generate the code.

The Menu Builder is used to create menus to add onto or replace FoxPro's system menu bar. You design and modify menus in a Menu Design window, then let FoxPro generate the necessary code.

A format is a custom screen design that can be included for backward compatibility.

Data Retrieval/Reporting Components

Reports, labels and queries used for data retrieval and reporting can be part of a project.

The Report Writer makes it easy to create custom reports by placing objects in a Report Layout window.

The Label Designer allows you to create labels in standard or custom formats by specifying options in a Label Layout window.

A query is a specific type of program that contains commands needed to extract information from one or more databases. The RQBE window allows you to create and modify a query without knowing any of the commands needed to extract information. You can choose buttons and options and FoxPro generates the necessary code.

External API Routine Components

External API routine components that can be included in a project are libraries. You can reference libraries of prewritten routines by including the libraries in a project.

Other Components

A project can contain database files, index files, keyboard macro files, view files, memory variable save files and *any other type* of file.

11 Project Manager

This chapter focuses on project management and the creation of applications. More information about projects is available in the FoxPro *Developer's Guide* and in the chapter titled Introduction to FoxPro Power Tools.

A project is the central mechanism used to unify and coordinate the elements of a FoxPro application. Creating a project is usually the first step in the process of developing an application. You specify the files that are required to create an application and the project manages the interrelations between the files, ensuring that the files are up-to-date when you build an application.

A FoxPro project:

- Remembers the location of every file it contains
- Accesses prewritten programs and interface components easily
- Stores object code
- Locates and assembles referenced files
- Tracks current versions of files
- Streamlines distribution

A project is a special database that has a .PJX extension and an associated memo file (.PJT).

Once you create a project and specify the files you want it to contain, you can use it to build an application (.APP) or an executable file (if you own the FoxPro Distribution Kit).

Creating a Project

You can create a project in the Project window. The steps involved in creating a project are listed below and each step is described in detail in its own section.

To create a new project:

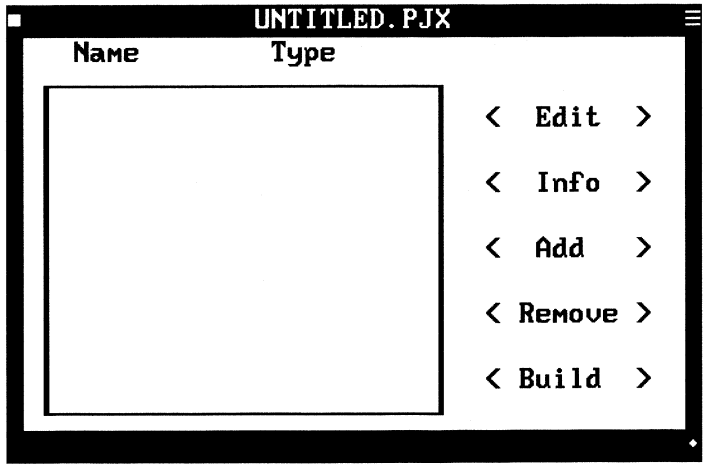
1. Open the Project window.
2. Add files to the project.
3. Build the project.

Open the Project Window

To open the Project window so you can create a project, do one of the following:

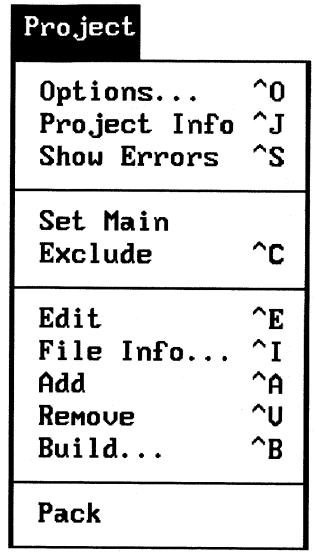
- Choose **New...** from the **File** menu popup, then choose the **Project** radio button and choose **OK**.
- Type `CREATE PROJECT` in the Command window and press Enter.

An untitled Project window appears so you can specify the files to be included in the project.



Project Window

When a Project window is frontmost, a **Project** menu popup is added to the menu bar. Each menu option on the **Project** menu is described in this chapter.



Project Menu

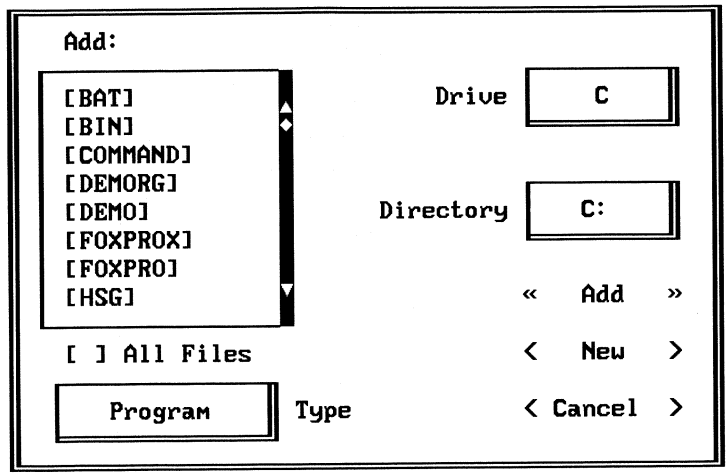
Add Files To the Project

A project keeps track of all the files needed to create an application, but you must add these files to the project initially. You can add *any type of file* to a project.



In the case of a program that calls other programs, you only need to add the main program to the project. The called programs are added to the project automatically when you build the project.

To specify files to include in a project, choose **Add** in the Project window or from the **Project** menu popup. An Add File dialog appears so you can add an existing file or a new file to the project.



Add File Dialog

You can include any type of file in the project: program, screen, menu, query, report, label, library, format, database (any associated memo file and structural .CDX are automatically added), index, or any other type of file. You can even add files such as keyboard macro, view and memory variable save files.

From the **Type** popup, select the file type you wish to add. The file list displays only files of the selected type. Now, you can add an existing file or a new file.

Add an Existing File

When the desired file type appears on the **Type** popup in the Add File dialog, select the file you want to include in the project and choose the **Add** push button. (Any .FXPs with no source code are listed with .PRGs in the Open File dialog when **Program** appears on the **Type** popup.) The file name appears in the Project window.



The first file added to the project that FoxPro can execute (menu, screen or program) appears with a bullet next to its type, indicating that it is the main file. The main file is similar to a main procedure file — it contains references to all the other parts of the project. To specify a different main program, select the desired file in the Project window and choose **Set Main** from the **Project** menu popup.

You may continue adding files one by one until all the files in your application appear in the Project window.

Add a New File

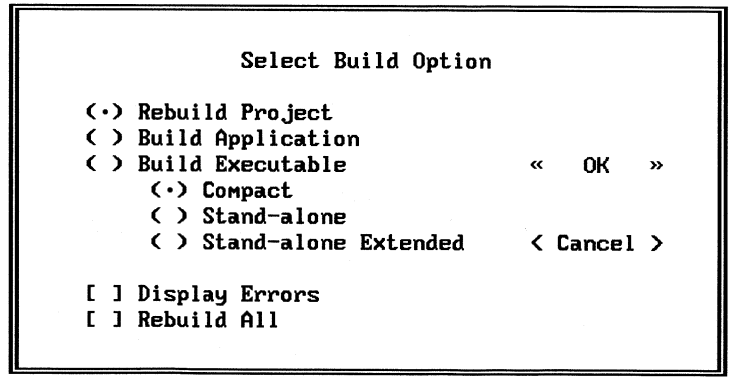
When the desired file type appears on the **Type** popup in the Add File dialog, choose the **New** push button. The following file types cannot be added as a new file: Library, Index, Database, File and Application. A Save As dialog appears so you can name the new file. Once you name the file and choose **Save**, the appropriate type of window appears so you can create the new file.

The Project window displays the name of the new file, regardless of whether you add information to the file and save it, leave the file empty and save it, or don't even save the file.

You may continue adding files one by one until all the files in your application appear in the Project window.

Build the Project

To create the project file, choose **Build** in the Project window or choose **Build...** from the **Project** menu popup. A Build Option dialog appears.



Build Option Dialog

Choose the **Rebuild Project** radio button to indicate that you want to build a project.



In the case of a program that calls other programs, you only need to add the main program to the project. The called programs will be added to the program automatically when you build the project.

Two check boxes appear in the Build Option dialog:

- Check **Display Errors** if you want any errors that occur during the build process to be displayed in a window after the build is complete. If you don't check this check box, you can still see the errors anytime after you build by choosing **Show Errors** from the **Project** menu popup.
- Check **Rebuild All** if you want to refresh all files in the project. Otherwise, FoxPro only refreshes files with a source time stamp that is later than their time stamp in the project file.

When you are satisfied with your choices, choose **OK**. If your project is untitled, FoxPro asks if you want to save the project. Choose **Yes** to save the project. A Save As dialog appears. Name the project and choose **OK**. FoxPro automatically builds a project file unless it can't locate a file in the project.

If FoxPro can't find a file in the project, it looks for the file in the following locations and in this order: the default directory, the directory where the project is located, any place where it has previously found a file in the project, or along the FoxPro path.

If FoxPro *still* can't find the file, a Locate File dialog appears. This dialog displays the name of the file that cannot be located, along with the following push buttons:

Locate Displays an Open File dialog so you can adjust the drive and directory as necessary to locate the file that FoxPro cannot find. Once you find the file, select it and choose **Open**. FoxPro stores the location of the file in the Project so it can locate it in the future. The build process continues.

Ignore Ignores the file that it can't find and builds the project without knowing where the file is located.

Remove Removes the specified file from the project then continues with the build process. When you remove a file from a project, the associated record in the project's .PJX database remains but is marked for deletion. When you have removed several files from a project, you may want to choose **Pack** from the **Project** menu popup to remove records from the .PJX database that are marked for deletion.

Cancel Cancels the build process and returns you to the Project window.

When you build a project, code is generated for any menus or screen sets that are part of the project.

Creating Applications

When you build an application from a project, any files in the project that can be executed (programs, screens, menus) are combined as part of the application code. Any other types of files are included in read-only form as part of the application unless you choose **Exclude** from the **Project** menu popup.

When you choose **Exclude**, a ø appears in the Project window next to the selected file name, indicating that the file will not be included as part of the final application.



Excluded files are listed in the Project window for your reference but must be manually distributed if they are needed by the application.

You will want to exclude any files such as databases, indexes, reports and labels that you want the end user to be able to modify. If you change your mind and want to include a file you excluded, select the file in the Project window and choose **Include** from the **Project** menu popup.

To create an application from a project:

1. Display a project in the Project window.
2. Choose **Build** in the Project window or choose **Build...** from the **Project** menu popup.

   The Build Option dialog appears.
3. Choose **Build Application**.

   The **Build Executable** radio button and the associated **Compact**, **Stand-alone** and **Stand-alone Extended** radio buttons are disabled unless you purchase the FoxPro Distribution Kit.
4. If you want to see any errors that occur during the build process, check the **Display Errors** check box.

   If **Display Errors** is checked, any errors that occur during the build process are displayed in a window after the build is complete. If you don't check this check box, you can still see the errors anytime after you build by choosing **Show Errors** from the **Project** menu popup.

5. If you want to refresh all files in the project, check **Rebuild All**.

   Otherwise, FoxPro only refreshes files with a project time-stamp that is not current.

6. When you are satisfied with the settings in the Build Options dialog, choose **OK**.

A Save As dialog appears so you can name the application or executable. Name the application and choose **OK**. FoxPro automatically builds the application unless it can't find a file in the project.

If FoxPro can't find a file in the project, it looks for the file in the following locations and in this order: the default directory, the directory where the project is located, any place where it has previously found a file in the project, or along the FoxPro path.

If FoxPro *still* can't find the file, a Locate File dialog appears. This dialog displays the name of the file that cannot be located, along with the following push buttons:

Locate Displays an Open File dialog so you can adjust the drive and directory as necessary to locate the file that FoxPro cannot find. Once you find the file, select it and choose **Open**. FoxPro stores the location of the file in the Project so it can locate it in the future. The build process continues.

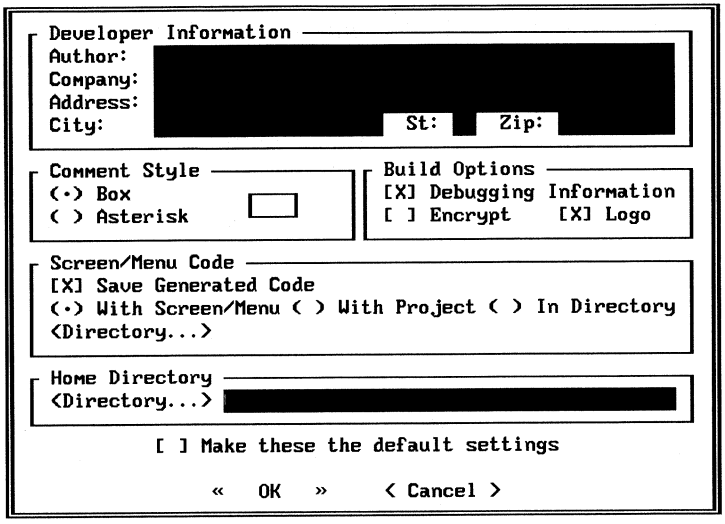
Ignore Ignores the file that it can't find and builds the project without knowing where the file is located.

Remove Removes the specified file from the project then continues with the build process. When you remove a file from a project, the associated record in the project's .PJX database remains but is marked for deletion. When you have removed several files from a project, you may want to choose **Pack** from the **Project** menu popup to remove records from the .PJX database that are marked for deletion.

Cancel Cancels the build process and returns you to the Project window.

Specifying Project Options

For each project, you can specify customized information for use when the project is built. To specify this information, choose **Options...** from the **Project** menu popup. The Project Options dialog appears.



Project Options Dialog

In the Project Options dialog, you can specify developer information such as name, company and address. You can also specify the style of comments in the code, build options and where generated screen and menu code will be stored. If you want the settings you specify in this dialog to be used for all new projects, just check the **Make these the default settings** check box.

Developer Information

You can specify developer information for the project by entering information in the text boxes labeled Author, Company, Address, City, St(ate) and Zip in the Project Options dialog.

Comment Style

In the Project Options dialog, you can specify the style of comments in generated code. Choose the **Box** radio button if you want comments to appear in a single line box. Choose the **Asterisk** radio button if you want comments to appear surrounded by asterisks.

Build Options

You can specify whether you want to include debugging information with compiled code when you build the project and whether you want to encrypt the compiled code when you build the project. You can specify none, one or both of these options.

If you want your compiled file(s) to be scrambled for security, check the **Encrypt** check box in the Project Options dialog. If any encrypted .FXPs are included in your project, the code created when you build the project *must* be encrypted. The **Encrypt** check box is checked automatically if this is the case.

To include debugging information with your compiled code so that you can see each line highlighted in the Trace window during execution, check the **Debugging Information** check box. When **Debugging Information** is *not* checked, information needed for FoxPro to trace through the code is not saved, reducing the size of your compiled code by approximately two bytes per source program line (excluding comments and blank lines).

Logo is checked by default and only affects executable .EXE files created with the FoxPro Distribution Kit. When you create an executable with **Logo** checked, the FoxPro startup logo is displayed when a user runs the executable. Uncheck **Logo** to build an executable that suppresses the logo display.

Location of Screen and Menu Code

In the Project Options dialog, you can specify that generated screen and menu code should be saved by checking the **Save Generated Code** check box. If you decide to save the generated code, you must choose one of the following radio buttons to determine where the generated code will be saved:

With Screen/ Menu Saves generated code in the same directory as the corresponding source screen and/or menu file. In the case of a screen set containing multiple screens with source files in more than one directory, the generated code is saved with the first screen in the set.

With Project Saves generated code in the same directory as the project file.

In Directory Enables a **Directory...** push button that you can choose to display the Select Directory dialog and specify a location for the generated code. Make sure that the desired drive and directory appear on the popup controls and choose **Select**. Instead of choosing the **Directory...** push button, you can type the location in the text box next to the **Directory...** push button.

Home Directory

Each project has a home directory that, by default, is the current working directory. The home directory is used to make your applications portable. During development, you should save the project and the application built from the project in the home directory. Any files needed by the project should be stored in subdirectories of the home directory. Many developers create a subdirectory for each type of file needed by the project, allowing them to organize their files by file type.

You can specify a home directory in the Home Directory area of the Project Options dialog. By default, the directory where FoxPro is located appears in the text box in the Home Directory area. To specify a different home directory, type the desired path in the text box or choose the **Directory...** push button to display the Select Directory dialog. In the Select Directory dialog, make sure that the desired drive and directory appear on the popup controls and choose **Select**.

When you distribute an application to others, you can use any directory on the destination machine as the new home directory. The new home directory can be *any* directory with *any* name at *any* level of the directory structure, as long as it has the same subdirectories containing the same needed files. Just copy the application to its new home directory then create the *same* subdirectories off of the new home directory and copy the needed files to these subdirectories. (You may want to create an installation routine to create directories and copy files.)

Use Settings for All Projects

If you check **Make these the default settings** in the Project Options dialog, the same options are specified by default every time you create a new project. To adjust these options, choose **Options...** and make changes in the Project Options dialog.

Modifying a Project

You can modify a project in the Project window. To modify an existing project:

1. Display a project in the Project window.
2. Modify the project.
3. Refresh the project.
4. Check project and file information.

Display a Project in the Project Window

To display an existing project in the Project window so you can modify it, do one of the following:

- Choose **Open...** from the **File** menu popup and choose the desired project file (.PJX), then choose **Open**.
- Type MODIFY PROJECT <project_name> in the Command window and press Enter.

The Project window appears so you can modify the project.

Modify the Project

You can modify the project by adding and removing files, editing files and specifying the main file.

To add a file to the project, refer to the section titled Add Files To the Project.

To remove a file from the project, select the desired file and choose **Remove** in the Project window or from the **Project** menu popup. An alert appears to confirm that you want to remove the file from the project. Choose **Yes** to confirm your intention to remove the file or **No** to cancel the removal.

When you remove a file from a project, the associated record in the project's .PJX database remains but is marked for deletion. When you have removed several files from a project, you may want to choose **Pack** from the **Project** menu popup to remove records from the .PJX database that are marked for deletion.

To edit a file in a project, select the file and choose **Edit**. The file appears in the appropriate type of window so you can modify it.

To specify the main file, select the file in the Project window and choose **Set Main** on the **Project** menu popup. The main file is similar to a main procedure file — it contains references to all the other parts of the project.

Refresh the Project

You never need to refresh a project manually. When you build a project or an application, FoxPro automatically refreshes the project to guarantee that applications created from a project always use the most recent source. You may want to refresh a project manually when you make changes to files in the project or when dependencies change. To refresh a project manually, follow the instructions in the section titled Build the Project.

Check Project and File Information

To see status information for project, choose **Project Info** from the **Project** menu popup. The Project Information dialog appears.

C:\FOXPROX\UNTITLED.PJX

Date of Last Build:

Type	Current	Out of Date	TOTALS
Program	0	2	2
Screen Set	0	0	0
Menu	0	0	0
Query	0	0	0
Report	0	0	0
Label	0	0	0
Library	0	0	0
Format	0	0	0
Database	0	0	0
Index	0	0	0
Other	0	0	0
TOTALS	0	2	2

« OK »

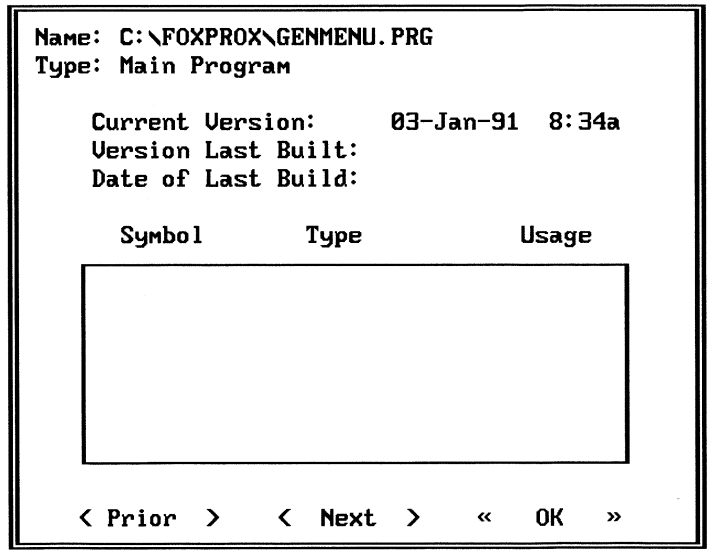
Project Information Dialog

The Project Information dialog displays the full file name and path for the project, as well as the most recent date that the project was built. This dialog also lists each type of file that the project can contain, along with:

- The number of files of each type having current time stamps
- The number of files of each type having out-of-date time stamps
- The total number of files of each type included in the project

When you are ready to return to the Project window, choose **OK**.

To see build information for a specific file in the Project window, select the file and choose the **Info** button in the Project window or choose the **File Info...** option on the **Project** menu popup. The File Information dialog appears.



File Information Dialog

The File Information dialog displays:

- The name and path of the selected file
- The type of the selected file
- Time stamp for the current version, the version last built and the date of the last build
- Information about symbols

To see this information for the next file in the Project window, choose **Next**. To see this information for the previous file in the Project window, choose **Prior**. When you are ready to return to the Project window, choose **OK**.

Debugging an Application

When you debug an application created from a project, the source for the files in the project does not need to be located in the same directory as the application. The project file can locate the source files because it contains information about the location of these files.

If several projects share the same screens and/or menus or files, you may find that you get "Source out of date" messages while debugging. Make sure you rebuild the project before debugging or use the Project Options dialog to put each project's generated code into its own directory.

If you get a "Source not found" error while debugging or an unexpected "File not found" error while running your application, your home directory may be incorrect. Make sure that the home directory is set to be the place where the application will run from and that the application is built into that directory. For example, if C:\FOXPRO25\MYAPP is your home directory, build the application into C:\FOXPRO25\MYAPP.

Whenever program execution is suspended, the **Build** push button is disabled in the Project window.

12 Screen Builder

When you build a screen, you are actually creating a piece of FoxPro source code for your application.

Instead of writing code to create the screen line by line, the Screen Builder allows you to position and size fields, push buttons, radio buttons, check boxes, popups, lists, text edit regions, text, lines and boxes in a Screen Design window.

When you define an object, you can assign it a RANGE clause, a VALID clause, a WHEN clause, a DEFAULT clause, color and other attributes. Clauses can be assigned a value that is an expression or a procedure. If the value is a procedure, you can write *code snippets* to specify the behavior of the object. A code snippet is a procedure or expression associated with a specific clause for a specific object in a screen. You can also define code snippets that perform actions on the entire screen.

Other code can also be associated with a screen file. You can create code snippets that include setup code, cleanup code and additional procedures. Setup code might include code to open files, set filters, declare memory variables, etc. Cleanup and procedure code might include code to close files, deactivate windows or restore the previous environment. Any procedures called by name in other screen code snippets should be included in the cleanup and procedure code.

Because these code snippets are stored within the screen file, a screen file is actually a form of source code for an application. It becomes a piece of an application just like a program file.

Information about the objects on the screen is saved in a database file with an .SCX extension. Once the screen has been designed, code is generated using the screen generator. The screen generator uses the screen information stored in the .SCX database to create a program file.

The generated code includes the object definitions, code snippets, and optional setup and cleanup code specified in the Generate dialog. The program file can then be executed to activate the interface you have designed. For a complete description of the sequence of generated code, see the Screens chapter of the FoxPro *Developer's Guide.*

Multiple screen panels, defined by the .SCX files, can even be combined by the generator into screen sets. Screen sets become part of an application and are included in a project file just like any piece of source code.

About This Chapter

This chapter documents Screen Builder features in the following order:

- Starting the Screen Builder
- Types of objects that can be defined
- Manipulating objects in the Screen Design window
- Assigning code snippets to individual objects
- Options on the **Screen** menu popup including instructions on how to define windows and objects in the Screen Design window

The options on the **Screen** menu popup are described in the order they appear. All dialogs associated with the menu options are also described.

This chapter does not include a tutorial on screen design. Instructions for beginners are available in the Designing a Custom Input Screen chapter of the FoxPro *Getting Started* manual. Information for advanced users is available in the FoxPro *Developer's Guide*.

> Unless otherwise noted, all pictures in this chapter are from the BROWSER.SCX screen. This screen and all associated files are located in the FOXPRO25\SAMPLE\SCREENS\ directory.

Starting the FoxPro Screen Builder

Before you start the FoxPro Screen Builder, you can create the working environment by opening the necessary database(s), setting the index order, and establishing relations. All fields in open databases are available for use in the Screen Builder. This environment information can be saved in the .SCX database.

It is not necessary to have a database open to access the Screen Builder. It is possible to design stand-alone screens that can be used to access and display data in a variety of ways.

Creating a New Screen

To create a new screen:

1. Choose **New...** from the **File** menu popup.
2. Choose the **Screen** radio button.
3. Choose **OK**. An untitled Screen Design window appears.

If you prefer, you can create a new screen in the Command window by typing:

```
CREATE SCREEN
```

A Screen Design window appears with UNTITLED.SCX as its title. You will be prompted to name the screen the first time it is saved. Alternately, you can type:

```
CREATE SCREEN <filename>
```

in the Command window. A Screen Design window appears with the file name followed by the default .SCX extension as its title.

Opening an Existing Screen

To open an existing screen, choose **Open...** from the **File** menu popup to display the Open File dialog.

Make sure **Screen** appears on the **Type** popup. Choose the desired screen file from the list, then choose **Open**.

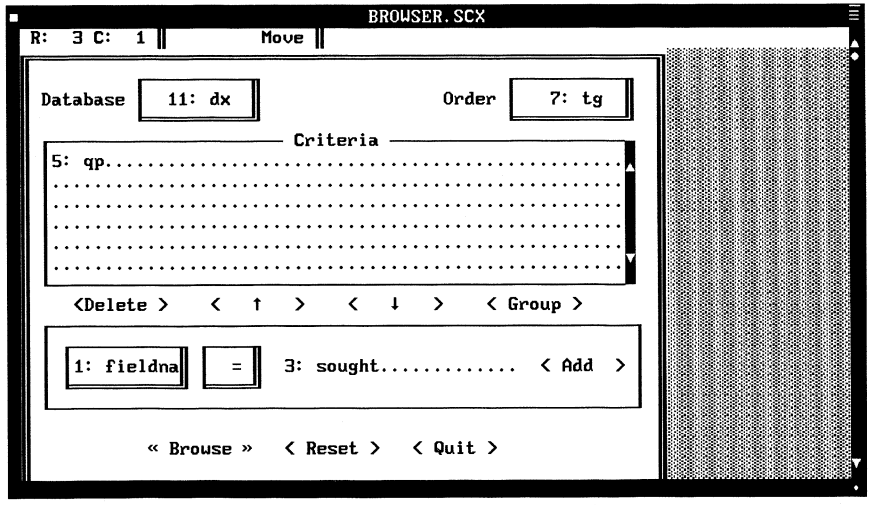
Any associated database and index files are opened automatically if the **Restore Environment** check box is checked in the Open File dialog. Any relations that have been set are re-created as well. **Restore Environment** is checked by default.

If you uncheck the **Restore Environment** check box in the Open File dialog, the screen opens without restoring any previously saved environment conditions.

If you prefer, you can type the following command in the Command window to open an existing screen with its environment:

```
MODIFY SCREEN <filename>
```

A Screen Design window with the specified screen file appears.



Screen Design Window with BROWSER.SCX



If the environment information saved with a screen becomes invalid (e.g., and index tag no longer exists), an error message is displayed and the screen will open.

To open an existing screen without its environment, you can type the following command in the Command window:

```
MODIFY SCREEN <filename> NOENVIRONMENT
```

Opening Multiple Screens

You can open many screen files at the same time so that you can cut and paste objects between screens. The number of screen files you can open is limited only by available memory and available file handles.

When you copy an object from one screen and paste it into another, all information associated with the object, including code snippets, is copied as well.

Quick Screen

Quick Screen is a feature of the Screen Builder that automatically places selected fields in the Screen Design window. All you need to do is position the fields and insert text or graphics to finish creating the screen. For more information on this feature, see the corresponding section later in this chapter.

Screen Builder Objects

FoxPro screens are composed of objects that can be manipulated in a variety of ways. These objects include graphic objects (lines and boxes), field objects, controls and text objects.

Graphic Objects Lines and boxes are available for use in screens. These optional items often make screens easier to comprehend and aesthetically pleasing as well.

Field Objects Field objects display data from a database field, a memory variable, a complex expression or a user-defined function.

When a field object is a database field or a memory variable, it can be edited. Expressions such as calculated values can be displayed but not edited.

Field objects can be defined to be edit regions. Edit regions can be several lines deep and can have scroll bars to allow the display and editing of large amounts of data.

Controls Controls include push buttons, radio buttons, check boxes, popups and lists.

Text Objects In the Screen Design window, text is treated as an object and can be selected, moved, stacked or deleted.

Creating Objects

Options on the **Screen** menu popup allow you to create the objects described above. You may assign code snippets to these objects as you define them. For complete descriptions of each object type and how to define objects, see the appropriate sections later in this chapter.

Selecting and Moving Among Objects

When several objects are present in the Screen Design window, you can press Tab and Shift+Tab to move from object to object. The cursor moves from object to object in the Screen Design window from left-to-right and top-to-bottom.

To select an object with the keyboard, press the Spacebar when the cursor is positioned on it.

To select an object with the mouse, point to the desired object and click.

Selecting Multiple Objects

With the keyboard, you can select multiple objects by selecting the first object, then holding down the Shift key and using the arrow keys to move the cursor to the next object. When the cursor is on the next object, press Shift+Spacebar. Continue until all desired objects are selected.

Select multiple objects with the mouse by holding down the Shift key and clicking on the desired objects.

Multiple objects can also be selected with the *selection marquee*. The selection marquee appears as a dotted line in the Screen Design window.

To use the selection marquee with the keyboard:

1. Position the cursor outside the objects to be selected.
2. Press the Spacebar to anchor the marquee. A dot appears in the Screen Design window in place of the cursor.
3. Use the arrow keys to draw the marquee around the objects you want to select.
4. Press Enter. All objects in the marquee are selected. Objects that are partially contained in the marquee are selected as well.

To use the selection marquee with the mouse:

1. Position the pointer outside the objects to be selected.
2. Press the mouse button and drag the selection marquee around the desired objects.
3. Release the mouse button. All objects enclosed in the marquee are selected. Objects that are partially contained in the marquee are selected as well.

Use the keyboard or mouse to select any combination of objects. When multiple objects are selected they act as one object when moved, edited (cut, copied, pasted) or deleted.

Inverting Selected Objects

You can invert selected objects with the selection marquee. When you invert objects, selected objects become deselected and deselected objects become selected.

To invert objects with the keyboard:

1. Press the Shift key, then use the arrow keys to position the cursor outside of the objects you wish to invert.
2. While holding the Shift key down, press the Spacebar to anchor the selection marquee. A dot appears in the Screen Design window in place of the cursor.
3. Use the arrow keys to draw the selection marquee around the desired objects.
4. When the marquee surrounds the desired objects, press Enter. Objects that were selected are now deselected and objects that were deselected are now selected.

To invert objects with the mouse

1. Press the Shift key, then drag the mouse to draw the marquee around the objects.
2. Release the mouse button. Objects that were selected are now deselected and objects that were deselected are now selected.

Deselecting Objects

To deselect *all* selected objects in the Screen Design window, position the cursor off of any selected objects and press the Spacebar.

To deselect *all* selected objects with the mouse, position the pointer off of any selected objects and click.

To deselect *single* objects when multiple objects are selected, hold down the Shift key and use the arrow keys to position the cursor on the object you want to deselect. Press the Spacebar. The specified object is deselected while all other selected objects remain selected. With the mouse, Shift+click on each selected object that you want to deselect.

Sizing Objects

To size an object with the keyboard:

1. Position the cursor on the desired object.
2. Press Ctrl+Spacebar. The object blinks to show that it is ready for sizing.
3. Use the arrow keys to make the object the desired size.
4. Press Enter to confirm the action.

To size an object with the mouse:

1. Ctrl+click on the desired object. The object blinks to show that it is ready for sizing.
2. Hold down the mouse button and drag until the object is the desire size.
3. Release the mouse button.

When you resize objects they may overlap each other. After resizing an object, you can move it to a new location in the Screen Design window.

Moving Objects

To move objects with the keyboard, select the desired object and use the arrow keys to move the object to its new location in the Screen Design window. Press Enter or the Spacebar to confirm the move.

With the mouse, click on the desired object to select it, then drag the object to its new location in the Screen Design window. Click anywhere outside the object to deselect it.

When moving multiple objects with the mouse, be sure the pointer is positioned on any selected object in the Screen Design window. Click and drag the objects to the desired location. If you click the mouse on an area in the Screen Design window that is not a selected object, all objects will become deselected.

If you move an object and press Escape while the object is still selected, the object will revert to its previous location.

Deleting Objects

To delete an object, select it and press Backspace or Delete.

Object Dialogs

Every object in the Screen Design window has an associated primary dialog. Some primary dialogs can bring forward additional dialogs.

To bring forward the primary dialog for an object with the keyboard:

1. Position the cursor on the desired object.
2. Double-click with the Spacebar or press Enter. The primary dialog for the specified object appears.

To bring forward the primary dialog for an object with the mouse:

1. Position the pointer on the desired object.
2. Double-click on the object. The primary dialog for the specified object appears.

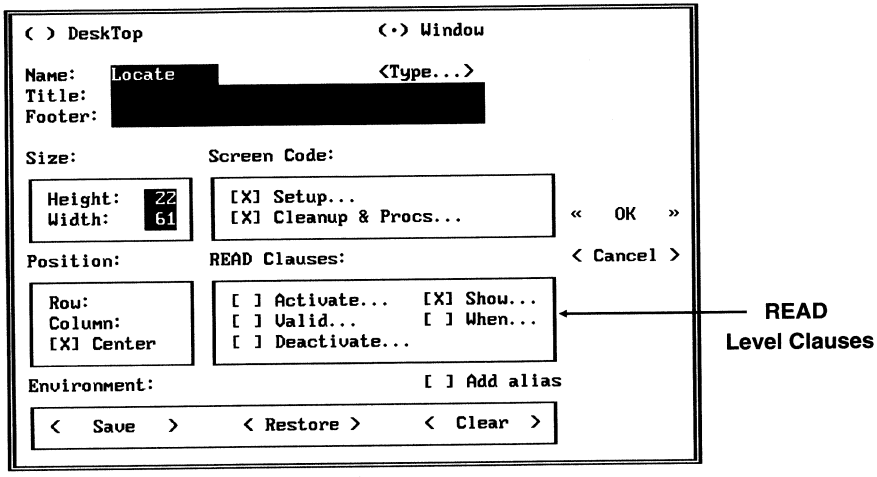
Assigning Code Snippets to Objects

Entire screens and individual objects within each screen may be assigned certain clauses to define the behavior of a screen or object. Options in the Screen Layout dialog and in the primary dialog for specific objects allow you to specify or define a procedure or an expression associated with a specific clause for the screen or object. All code snippets for clauses are defined in the same manner.

When you define fields and controls in the Screen Design window, a dialog associated with the specified object appears. This dialog contains many options associated with the field or control you are defining. All of these dialogs contain check boxes that allow you to define clauses for the object.

READ and Object Level Clauses

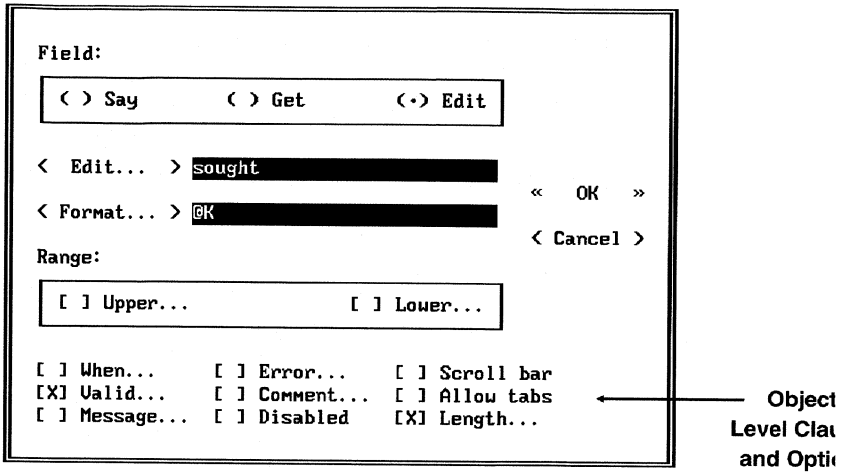
The Screen Layout dialog contains READ level clauses (**Screen Layout...** is an option on the **Screen** menu popup). Clauses defined in this dialog apply to the entire screen. The READ level clauses you may define are ACTIVATE, VALID, DEACTIVATE, SHOW and WHEN.



Screen Layout Dialog

For information on these clauses, see the READ command in the FoxPro *Language Reference.*

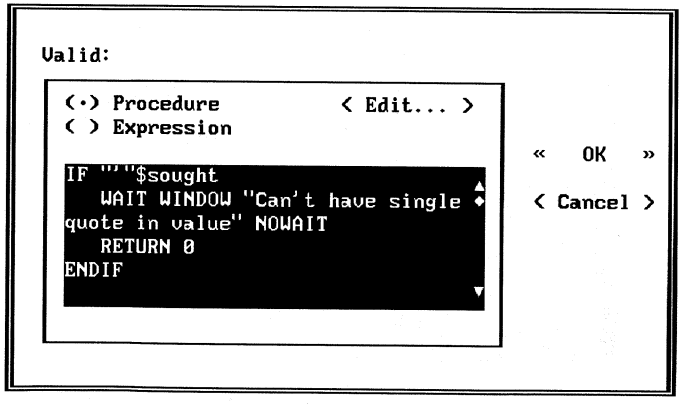
Clauses defined for specific objects are called object level clauses. These clauses are defined for a specific object in the screen. The Object level clauses you may define are WHEN, VALID and MESSAGE. You can also define an ERROR clause for GET and EDIT fields.



Screen Field Dialog

For information on these clauses, see the @ ... GET command for the appropriate object in the FoxPro *Language Reference.*

To specify or define a clause, choose the check box for the desired clause in the primary dialog for the specified object. A Code Snippet dialog appears with the clause name in the upper left corner. Below the clause name are two radio buttons, **Procedure** and **Expression**. An **Edit...** push button is located in the upper right corner of the dialog.



Code Snippet Dialog

Clauses as Procedures

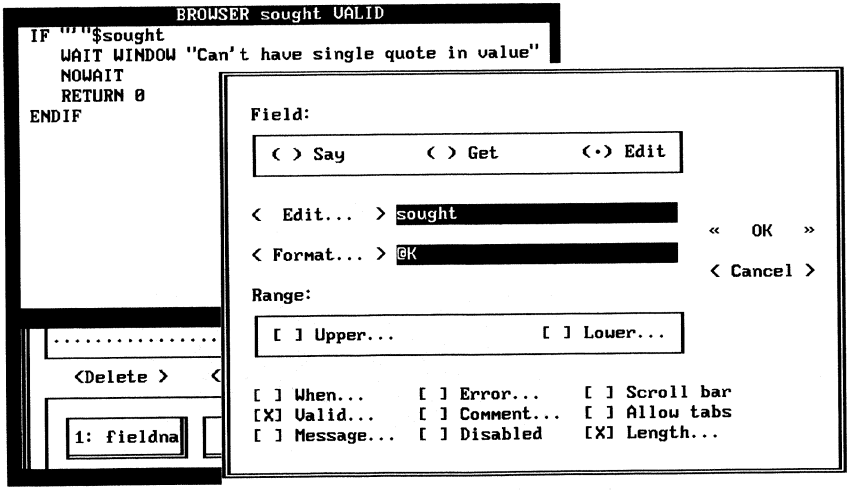
The **Procedure** radio button is selected by default. You may write code snippets for the procedure in the text editing region of the Code Snippet dialog or choose the **Edit...** push button to open a program editing window behind the dialogs.

The text editing region of this dialog allows the use of tabs to indent code. In all other FoxPro dialogs, pressing Tab moves you from one area of a dialog to the next. Because pressing Tab in the text editing region inserts a tab in the region, you must press Ctrl+Tab to exit the text editing region and move to the next area of the dialog. With a mouse, you may exit the text editing region by pointing and clicking on another area of the dialog.

To open an editing window, choose the **Edit...** push button to exit the Code Snippet dialog and launch a program editing window behind the primary dialog. Choose **OK** in the primary dialog. The procedure editing window is frontmost and you can begin coding.



Windows cannot open on top of dialogs. Program editing windows open behind the primary dialog



Program Editing Window Behind Screen Field Dialog

This also allows you to open multiple editing windows without having to choose the object and bring forward the primary dialog.



Do not enter a PROCEDURE or FUNCTION command when writing code for a clause at the READ or object level.

The screen generator automatically creates a unique name for each procedure at the READ and object level. This unique name is inserted in the generated code as the value for the specified clause. The procedure file is assigned the unique name and the code snippet you write follows it in the code. The screen generator documents the procedure to show specifically the screen, object and clause with which the procedure is associated.

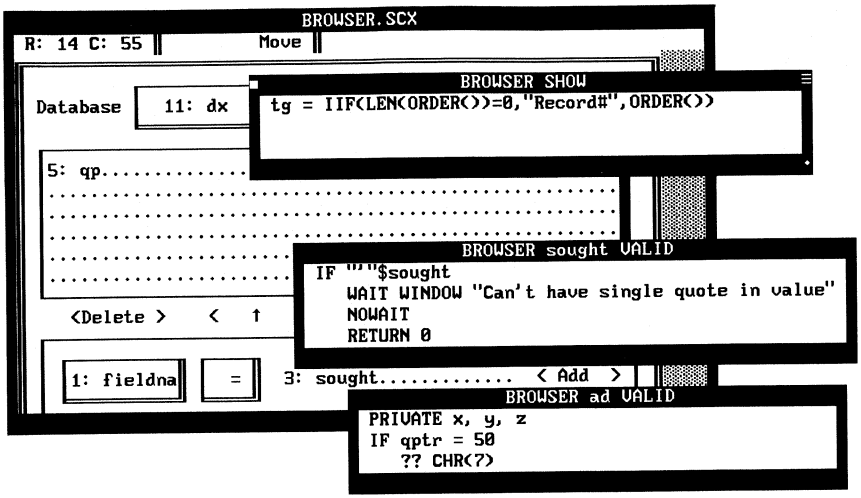
It is not necessary to place a RETURN at the end of your procedure. FoxPro will assume "RETURN .T." if a RETURN is not provided. If you want to return a value other than .T., the RETURN must be included.

Editing Multiple Procedures

To open several program editing windows at the same time:

1. Choose the desired clause check box.
2. Choose the **Procedure** radio button in the Code Snippet dialog.
3. Choose the **Edit...** push button to exit the Code Snippet dialog and open a program editing window for the specified clause. The editing window opens behind the primary dialog.
4. Choose the next desired clause in the primary dialog and repeat the process. Another procedure editing window will open on top of the previous editing window but behind the dialog.

Choose as many clauses as you like, then choose **OK** in the primary dialog. The cursor will be positioned in the topmost editing window. All program editing windows will remain open for you to enter and edit code. The title bar of each window displays the file name and the clause for READ level clauses, and the field name for the object and the clause for the specified field for object level clauses.



Multiple Procedure Editing Windows

When you save the screen with the **Save** option on the **File** menu popup, the code entered in the program editing window is saved in a corresponding field in the .SCX database.

All open editing windows appear as options on the **Window** menu popup. If you leave procedure editing windows open when you close the screen, they are opened automatically when you reopen the Screen Design window for modification. The windows open in the same position as when they were closed. If the windows were minimized and/or docked, they will open in that state.



Dock your program editing windows before you close the screen. The next time the screen is opened, the program editing windows open in their docked state. You can then maximize the windows to edit code without having to open them through their associated dialogs.

To close a program editing window, choose **Close** from the **File** menu popup, click on the close box or press Ctrl+W.

Clauses as Expressions

If the clause is an expression or a named procedure, choose the **Expression** radio button in the Code Snippet dialog.

A named procedure is a procedure you write and assign a name for with a PROCEDURE or FUNCTION command. A named procedure may be defined with the **Cleanup & Procs...** option in the Screen Layout dialog. It may also be any defined procedure located in

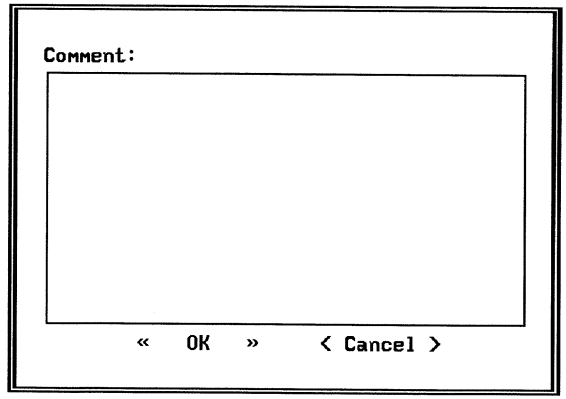
your path. You may define your path with the **Setup...** option in the Screen Layout dialog. The **Setup...** and **Cleanup & Procs...** options are described later in this chapter. Named procedures are called with a DO <procname> command.

Choosing the **Edit...** push button while the **Expression** radio button is selected brings forward the Expression Builder. You can use options in the Expression Builder to create the expression. Choose **OK** to return to the Code Snippet dialog where your expression will appear in the text editing region. Choose **OK** again to return to the primary dialog for the specified object.

Comments

You can assign comments to any object in the Screen Builder. These comments are for reference purposes only. They do not affect the generated output in any way.

To enter comments, choose the **Comment...** check box in the primary dialog for the defined object. The Comment dialog appears.



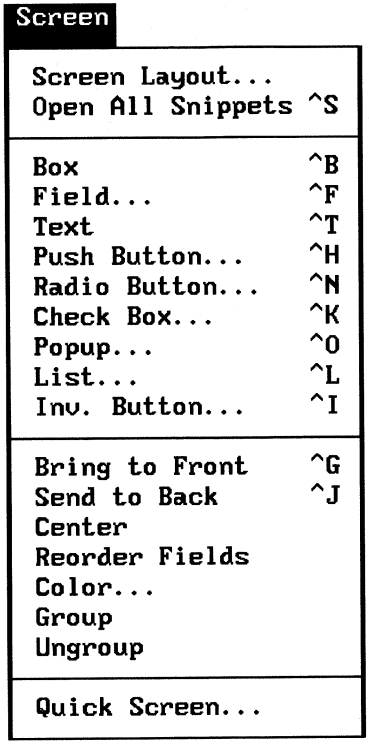
Comment Dialog

Enter your comments in the text editing area of this dialog. If your comments are lengthy, a scroll bar appears at the right of the editing area, allowing you to make your comments as long as you like.

When you are finished writing your comments, choose **OK** to return to the primary dialog for the specified object. When you save the screen, these comments are stored in a corresponding memo field of the .SCX database.

Screen Menu

When you start the FoxPro Screen Builder, the **Screen** menu is added to the menu bar.



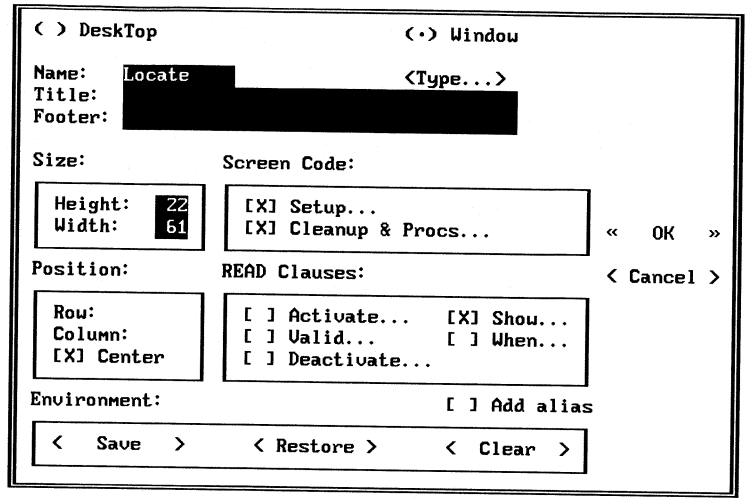
Screen Menu

The options on this menu allow you to create or modify an input screen definition file quickly and easily. An explanation of each **Screen** menu option follows.

Screen Layout...

Specify type and assign attributes to screen

Screen Layout... displays the Screen Layout dialog so you can define the location where the input screen will appear (on the monitor) and whether the screen will appear on the desktop or in a window. If you define a window, this option allows you to define the type and attributes for that window.



Screen Layout Dialog

Options in Screen Layout allow you to enter setup code for the screen and write code for procedures to be used with the screen. You can also write code snippets for ACTIVATE, SHOW, VALID, DEACTIVATE and WHEN clauses. These code snippets are stored in corresponding memo fields in the .SCX database.

At the top of the Screen Layout dialog there are two radio buttons, **Desktop** and **Window**.

Desktop Screens

Choose **Desktop** to indicate that the screen is to be placed on the desktop.



> A desktop screen cannot be brought forward over other windows and cannot be assigned any of the attributes available for FoxPro windows.

When the **Desktop** radio button is selected, you can define the size of the desktop (in rows and columns). Editing the row and column settings simply controls the available area where you can place objects in the Screen Design window. It does not change the size of the desktop.

The Screen Code, READ Clauses and Environment sections in this dialog are available for desktop screens. These options are described later in this section. All other options in this dialog correspond to window definitions and are dimmed when the **Desktop** radio button is selected.

Window Screens

Choose the **Window** radio button to define a window in which the screen will appear. When you choose the **Window** radio button, all the options in the Screen Layout dialog are active.

Name You can enter a window name in the Name text box. If you define the window without a name, the window will be assigned a unique name upon generation. Unless you need to call a window by name, it is best not to assign a name to the window.

Title The Title text box allows you to specify the text that will appear in the title bar of the window. The title is centered in the top border of the window. If the title is wider than the window, the title is truncated. If you do not enter a title, the window will be defined with no title.

Footer The Footer text box acts identically to the **Title** option except that the footer appears in the bottom border of the window. If you do not enter a footer, the window will be defined with no footer.

Size

Size options allow you to specify the size (in rows and columns) of the window. A window can be defined with coordinates that exceed the size of the Screen Design window. You can scroll the Design window to view areas not visible on your display.

By default, a window is defined to be the size of the Screen Design window. If objects are defined in the Screen Design window before the window is defined, the window is defined large enough to contain the objects.

To specify the size of a window by enter the desired height and width in the Height and Width text boxes.

A size control is located in the lower right corner of the window definition. If the window is defined with a border other than the System border, the size control is available but it is hidden. With a mouse, you can resize the window in the Screen Design window by clicking on the size control and dragging the mouse until the window is the desired size.

The Height and Width text boxes in the Screen Layout dialog reflect any changes you make when resizing a window with the size control.

Position

Position options allow you to specify the location of the window on the monitor. The row and column coordinates are relative to the upper left corner of the desktop. Enter the desired coordinates in the Row and Column text boxes. These settings define the location of the window after the code is generated.

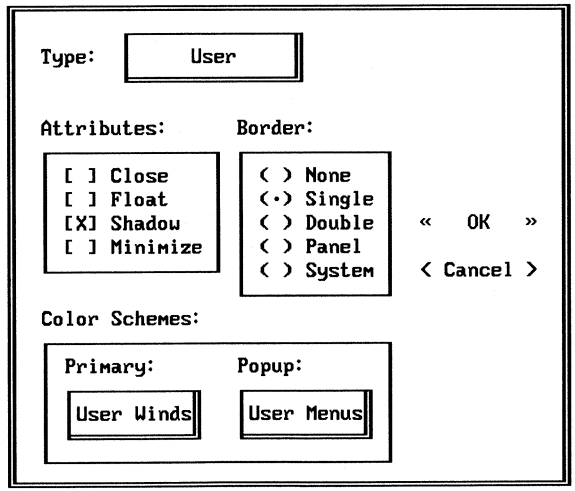
When you generate code for your screen(s), an option in the Generate dialog allows you to reposition the window(s) for generation purposes only. This feature is described in the Code Generation section of this chapter.

The **Center** check box is checked by default. When this option is selected, windows are centered on the desktop after generation. If all screens in a screen set are centered, they will be stacked on top of each other. You will need to reposition them prior to generation.

When you generate code for your screen(s), an option in the Generate dialog allows you to reposition the window(s) for generation purposes only. This feature is described in the Code Generation section of this chapter.

Window Types

Choose the **Type...** push button in the Screen Layout dialog to bring forward the Window Type dialog.



Window Type Dialog

At the top of this dialog is the **Type** popup. When you choose an option on this popup, predefined attributes and a border are automatically assigned to a window. The following table shows the predefined borders and attributes associated with each window type.

Window Types and Default Settings		
Window Type	**Attributes**	**Border**
System	Close Float Shadow Minimize	System
Dialog	Float Shadow	Double
Alert	Float Shadow	Double
User	Shadow (all options available)	Single (all options available)

Choosing **User** from the **Type** popup enables all options in the Window Type dialog. You can use these options to specify attributes and a border for user windows.

The following window attributes are available:

Close This option allows you to close the window with a menu option, with the keyboard or with the mouse.

If the window is defined with the **System** border option, you may also click the mouse on the close box in the upper left corner of the window's border.

If the window is not defined with the **System** border option, a hidden close box is still available in the upper left corner of the window's border. Clicking the mouse on this corner will close the window, even though you can't see a close box.

Float A window may be moved to any position on the screen if the **Float** option is checked.

A window defined without the **Float** option cannot be moved.

Shadow A window defined with the **Shadow** option checked has a darkened area behind it resembling a shadow. Any text or objects covered by the shadow will still be visible.

Minimize A window defined with the **Minimize** option checked can be shrunk to a size of 1 row by 16 columns. The minimized window will contain its title if one is defined. If you have not defined a window name, the minimized window contains a window name generated by the code generator. The minimized window can then be placed anywhere on the screen and maximized back to its original size at any time.

The following borders are available:

None The window will have no border.

Single The window will have a single line border.

Double The window will have a double line border.

Panel The window will have a wide border (like system windows) and any defined controls will be hidden.

System The window will have a wide border and any assigned controls will be visible.

Color Schemes

Two popups that allow you to specify default colors for a screen are available in the Window Type dialog.

The **Primary** popup allows you to specify a default color scheme for a window and all the objects in the window *except* popups. The **Popups** popup allows you to specify a default color scheme for popups within the window.

When you define an object in a screen, by default it is defined with the scheme specified in the Window Type dialog. You can, however, specify different color schemes for specific objects in a window by selecting the object and choosing **Color...** on the **Screen** menu popup.

Storing Code for Screen Setup and Procedures

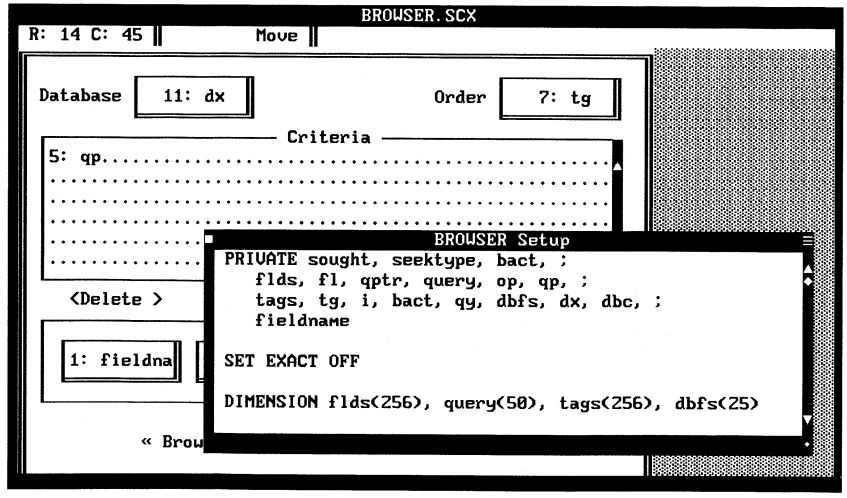
Two options in the Screen Layout dialog allow you to enter procedure code and screen setup information that is stored in the .SCX database.

Setup Code

When you choose the **Setup...** check box, a program editing window with the title <filename> Setup is opened behind the Screen Layout dialog. The <filename> is the name of the .SCX file with which the Setup program editing window is associated. Choosing **OK** in the Screen Layout dialog exits the dialog and positions the cursor in the first line of this program editing window.

Because windows cannot open on top of dialogs, program editing windows are launched behind the dialog. This also allows you to open multiple editing windows without having to choose the option and bring forward the dialog.

Use the **Setup...** option to enter initialization code for the program. Initialization code can include any commands to select work areas and use databases, set indexes and relations, etc. You can setup the environment with set commands and initialize memory variables with this option.



Setup Code for BROWSER.SCX



When defining memory variables for screens, the REGIONAL commands allows you to define variables to be specific to one screen. Declaring screen variables as regional in the set up code ensures that a variable is not affected by a variable with the same name used in another screen in the screen set. If the variables are declared as regional variables in their setup code, FoxPro automatically resolves the conflicts. For a complete description on the regional variables, see the REGIONAL section in the FoxPro *Language Reference*.

You can also define windows for your screens in this section. When you generate screens, an option in the Generate dialog allows you to suppress the generation of DEFINE WINDOW commands that use the information stored in the .SCX database to define the windows. If you suppress the generation of these commands, define your windows in your setup code.



If you want to restore your existing environment upon completion of the generated program, type CREATE VIEW <filename> at the beginning of your setup code. This creates a view file of the current environment. Later, in the closing procedure, you will restore the environment with the SET VIEW TO <filename> command.



When you define and generate screen sets containing multiple screens, setup code from successive screens is concatenated with the setup code from the first screen. It is possible to write code for one screen that will unintentionally change the desired output of code written for a previous screen. Careful planning and coding will ensure that you obtain the results you intended.

When you close the Setup program editing window, you are returned to the Screen Design window. When you save the screen, the setup code is saved in a corresponding memo field in the .SCX database.

Generator Directives

Generator directives were implemented in FoxPro to allow the user to include code in a generated screen program that would not otherwise be available through the Screen Builder.

Generator directives are commands that communicate solely with GENSCRN, FoxPro screen program code generator. Generator directives do not appear in generated screen program code. Generator directives must be placed in the Setup code for a screen. Only one directive of each type can be included in the code.

#SECTION 1 | 2

These generator directives allow you to split the setup code for a screen into two sections. Setup Code — Section 1 is generated at the beginning of the .SPR program. Setup Code — Section 2 is generated after the DEFINE WINDOW commands and before the Screen Layout commands. You would split the setup code if you wanted to include a PARAMETER statement or an ON ERROR statement in the screen program.

Precede commands to be inserted in section one of setup code with a #SECTION 1. If you would like other setup code to be placed in Setup Code — Section 2, a #SECTION 2 generator directive should follow commands in section 1.

```
#SECTION 1
      PARAMETER x, y, z
            <other commands>
      #SECTION 2
            <other commands>
```

#READCLAUSES <clauses>

This generator directive allows you to specify clauses to be placed at end of a READ command that are not available through the Screen Builder. Typical clauses to include are TIMEOUT, SAVE, OBJECT, NOMOUSE and COLOR.

```
#READCLAUSE TIMEOUT SAVE OBJECT COLOR

      * These READ clause must be
      * placed on one line in the
      * setup code.
```

#ITSEXPRESSION <char>

This generator directive allows you to specify a single character that can be used to indicate that picture clauses, window titles and window footers are expressions instead of literal strings.

```
#ITSEXPRESSION ~
#SECTION1
varname = "Fred"
* A window title can be defined
* as ~<varname>.  When the window is displayed, Fred
* appears as the window title.
```

The #SECTION1 generator directive is included in this example because the windows are defined before Setup Code — Section 2 is executed. #ITSEXPRESSION is applicable only to windows defined in the Screen Layout dialog in the Screen Builder.

#WNAME <string>

This generator directive allows you to substitute the current window name for <string> wherever it occurs in code. This allows you to use generic code which is independent of the unique window name generated by GENSCRN.

The following statement is defined in the setup code for a screen:

```
#WNAME fred
```

The following statements are defined in the ACTIVATE clause for a window:

```
IF WONTOP('fred')
      <statements>
ELSE
      <statements>
ENDIF
```

A unique name for the current window is substituted for "fred". It is not necessary to know the actual window name.

With the above example, the following code appears in the generated screen program:

```
IF WONTOP('_PV60NIAGH')  && Unique named window
      <statements>
ELSE
      <statements>
ENDIF
```

#REDEFINE

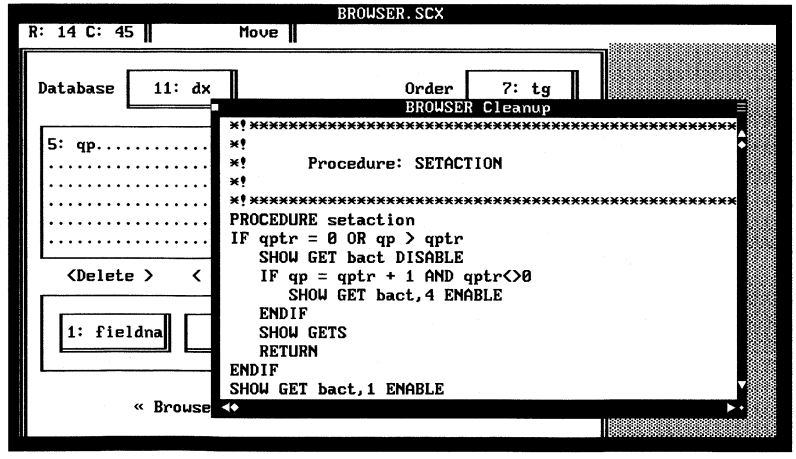
By default, GENSCRN generates code to check for the existence of a window before defining it. This generator directive allows you to suppress the commands that check for the existence of a window and automatically redefine the window.

Cleanup & Procs... Code

When you choose the **Cleanup & Procs...** check box, a program editing window with the title <filename> Cleanup is opened behind the Screen Layout dialog. The <filename> is the name of the .SCX file with which the Cleanup program editing window is associated. Choosing **OK** in the Screen Layout dialog closes the dialog and positions the cursor in the first line of this program editing window.

Because windows cannot open on top of dialogs, program editing windows are launched behind the dialog. This also allows you to open multiple editing windows without having to choose the option and bring forward the dialog.

The Cleanup program editing window is where you may enter code to close files, release windows, restore your environment, etc. All code entered with the **Cleanup & Procs...** option is inserted into the generated program.



Cleanup Code for BROWSER.SCX

Commands to release windows and close files can be automatically generated with the **Close Files** and **Release Windows** option in the Generate dialog. If these options are selected, the automatic closing code is generated and executed *before* the user-defined closing code.

You can also use this option to enter code for procedures that will be used throughout the screen. For example, if you will be using the same VALID procedure for several objects in the screen, writing your code here will prevent code duplication upon generation.



When writing procedure code with this option, you must include a PROCEDURE <procedure name> command.

When defining code snippets at the READ and object level (described earlier), the screen generator creates a unique name for your procedures. This does not occur with procedures defined with the **Cleanup & Procs...** option.

All code defined with the **Cleanup & Procs...** will be inserted into the generated program. You can enter many procedure files here, but be sure to give each a unique name and issue a RETURN at the end of each procedure. You can include your own comments or use FoxDoc to document your procedures if you like.

Editing Setup and Procedure Code

Program editing windows for setup and procedure code act like any FoxPro text editing window. You can use all the usual options to cut, copy, paste, find and replace, etc.

Choosing both the **Setup...** and the **Cleanup & Procs...** check boxes will display editing windows for each of these options behind the Screen Layout dialog. When you choose **OK**, the editing windows remain open.

When you save the screen, the code is saved in a corresponding memo field in the .SCX databases.

The size and location of program editing windows is saved when you close a screen file. When you modify the screen file, any program editing windows open in the same state as when the screen was closed.

Add Alias

When the **Add Alias** check box in the Screen Layout dialog is checked, aliases are automatically added to all field names in the Screen Design window.

READ Clauses

ACTIVATE, SHOW, VALID, WHEN and DEACTIVATE are READ level clauses to which you can assign code snippets for a screen. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

These clauses are documented in detail in the READ section of the FoxPro *Language Reference.* Examples of how these clauses are used are also available in the FoxPro *Language Reference* and in the FoxPro *Developer's Guide.*

Saving Screen Environment Information

At the bottom of the Screen Layout dialog are three push buttons that affect screen environment information: **Save**, **Restore** and **Clear**.

The following information about the environment can be saved with a screen:

- Open database files in all work areas
- The selected work area
- Index order on any open database file
- Any relations that have been set
- Any 1-to-Many condition

When you create a screen there are usually open databases, indexes, etc., that you will want to use whenever you modify or display the screen. The **Save** button in the Screen Layout dialog is used to save this environment information in the .SCX database when the screen is saved.

Restoring Screen Environment Information

If you have changed the environment by opening or closing databases, indexes, etc., while modifying a screen, you can restore the environment information previously saved with the screen by choosing the **Restore** push button in the Screen Layout dialog. The **Restore** push button will be disabled if no environment information is saved for the screen.

Clearing Screen Environment Information

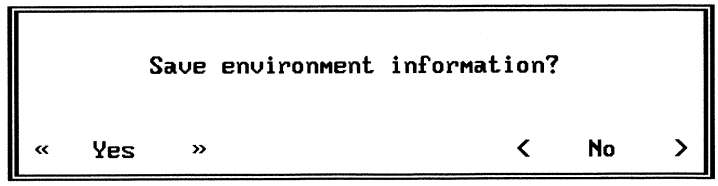
You can clear the environment information previously saved with the screen by choosing the **Clear** push button in the Screen Layout dialog.

The **Clear** push button is disabled if no environment information is saved for the screen.

Saving the Screen

Choose **Save** from the **File** menu popup to save the screen. Any modifications to the screen are saved on disk. The first time you save the screen, you will be prompted to name the screen file.

If you have not previously saved the environment information, an alert appears asking if you want to save the environment information now.



Choosing **Yes** saves the environment information in the corresponding fields of the .SCX database on disk. Choosing **No** saves the screen without environment information.



If the environment information saved with a screen becomes invalid (e.g., an index tag no longer exists), an error message is displayed and the screen will open.

Open All Snippets

Opens code snippet windows for all code snippets in the screen

Choose **Open All Snippets** to open program editing windows for *all* code snippets associated with the screen. The number of windows that are opened is limited by memory and available file handles.

To close *all* program editing windows associated with the screen, hold down the Shift key while choosing the **Screen** menu pad. The **Open All Snippets** option changes to **Close All Snippets**.

Creating Objects

Screens are composed of objects that can be manipulated in a variety of ways. These objects include graphic objects (lines and boxes), field objects, text objects and controls.

Box

Draw lines and boxes

Choose **Box** to place a box or line anywhere in the Design window. Boxes and lines can improve the look and readability of an input screen and bring attention to a particular area of the screen.

Creating a Box

To place a box in the Design window:

1. Position the cursor in the Design window in the location you would like the box to appear.
2. Choose **Box** from the **Screen** menu popup. A box, two columns wide by two rows deep, appears in the Design window. The box will blink to show that is immediately available for sizing.

Sizing a New Box

To size a new box with the keyboard:

1. Press the Right and Down Arrow keys to stretch the box to the desired size.
2. Press Enter to confirm the action. Only the right and bottom borders of the box stretch during sizing. When the box is the desired size, you can select the box and move it to a new location.

To size a new box with the mouse:

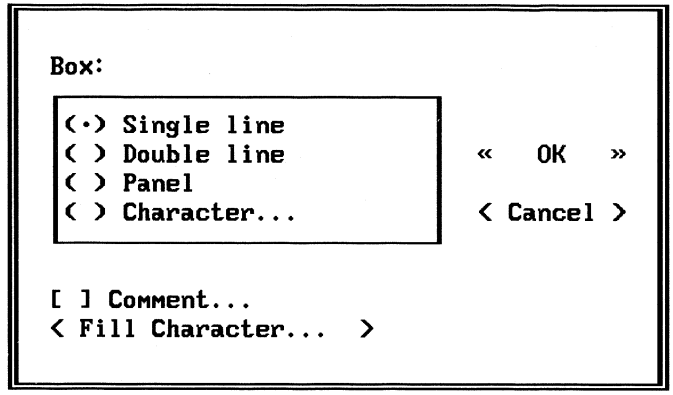
1. Click on the box and drag until the box is the desired size.
2. Release the mouse button. Only the right and bottom borders of the box stretch during sizing. When the box is the desired size, you can select the box and move it to a new location.

Manipulating Boxes

Boxes can be selected, moved, sized and deleted in the same manner as all screen objects. For more information, see the section titled Screen Builder Objects earlier in this chapter.

Box Dialog

Place the cursor on the box border and press Enter or double-click on the border with the mouse to bring forward the Box dialog.

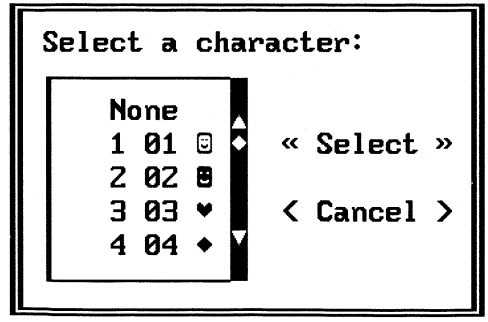


Box Dialog

Border and Fill

In the box dialog you can specify whether you want a box with a single line, double line, panel or character border.

Choosing the **Character**... radio button brings forward the Character dialog so you can specify a character for the border of the box. Choose a character from the scrollable list, then choose the **Select** push button to return to the Box dialog.



Character Dialog

Choose the **Fill Character...** push button to bring forward the Fill Character dialog. Select the desired character from the list, then choose the **Select** push button. You are returned to the Box dialog. Choose **OK** in the Box dialog to return to the Design window. The box is now filled with the selected character.

When you draw a box around existing objects in the Design window, the box is the topmost object in the window. If the box is filled, it covers the objects underneath it.

To place the box beneath these objects you must select the box and choose **Send to Back** from the **Screen** menu popup. The **Send to Back** option is described later in this chapter.

Comments

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

Drawing a Line

Drawing a line in the FoxPro Screen Builder is similar to drawing a box except you move the cursor or mouse in only one direction. To draw a line:

1. Position the cursor in the Design window in the location you would like the line to appear.
2. Choose **Box** from the **Screen** menu popup. A box, two columns wide by two rows deep, appears in the Design window. The box will blink to show that is immediately available for sizing.

With the keyboard, use the arrow keys to shrink the box so that it has not width or depth. Press the Right Arrow key to draw a horizontal line, or press the Down Arrow key to draw a vertical line. You can only draw horizontal and vertical lines. Using a combination of Down and Right Arrow keys will cause a box to be drawn. Press Enter to confirm the action.

With a mouse, click on the box and drag until the box has no depth and the line is the desired length. You can only draw horizontal and vertical lines. Dragging the mouse diagonally will cause a box to be drawn.

Options for Lines

Position the cursor on the line and press Enter, or double-click on the line to bring forward the Box dialog. The options available for boxes are also available for lines.

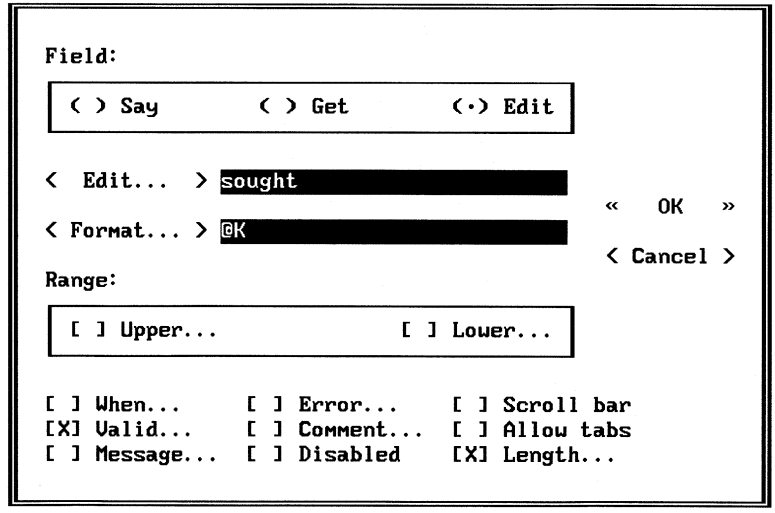
Manipulating Lines

Lines can be selected, moved, sized and deleted in the same manner as all screen objects. For more information, see the section titled Screen Builder Objects earlier in this chapter.

Field...

Place fields in the Design window

To place a field in the Design window, choose **Field...** from the **Screen** menu popup. The Screen Field dialog appears.



Screen Field Dialog

The Screen Field dialog allows you to define the field display in several ways. At the top of this dialog are three radio buttons — **Say, Get** and **Edit**. When you choose one of these buttons, the push button below changes to reflect your selection. These options differ in the way data is displayed and the clause options that are available at the bottom of this dialog.

After defining a field in the Screen Field dialog, the field is placed in the Design window. The size of the field in the Design window is evaluated in the following order:

- If a PICTURE format is defined in the Format text box, the field is the defined width of the picture.
- If there is no picture defined, the field in the Design window is the size of the field as defined in the structure of the database unless one of the following is true:
  - If the field is a SAY expression of character type and uses more than one field or variable, the size of the fields is concatenated and the field in the Design window is the total of all the fields in the expression.
  - If the field is a SAY expression of numeric type and uses more than one field or variable, the size of the field in the Design window is the size of the largest numeric field in the expression.
  - If the field is a SAY expression of date type, the field will be eight characters wide, even if calculations are performed.
  - All fields of memo type are defined as the width specified in the SET MEMOWIDTH command. The default SET MEMOWIDTH value is 50.
- If the field is not defined in the structure and has no picture clause, the size of the field will default to 10 characters wide.

You can change the size of fields after they are placed in the Design window.

Manipulating Fields

Fields can be selected, moved, sized and deleted in the same manner as all screen objects. For more information, see the section titled Screen Builder Objects earlier in this chapter.

Modifying Fields

Double-click on a field with the keyboard or the mouse to bring forward the Screen Field dialog for the specified field. Make any desired changes in this dialog, then choose **OK** to return to the Design window.

Say Fields

When the **Say** radio button is selected, you may enter the SAY expression in the text box to the right of the **Say...** push button, or you may choose the **Say...** push button to bring forward the Expression Builder. SAY expressions are for display purposes only and cannot be edited in the generated screen. The expression may be a calculated value, a combination of fields or any valid expression.

You can define fields from any open database. Enter `<alias.fieldname>` in the text box, or use the **Database** popup in the Expression Builder.

When you define a SAY expression, only the **Comment...** and **Refresh** check boxes are available. These options are described in detail later in this chapter.

Get and Edit Fields

You can enter a GET or an EDIT field or variable in the text box to the right of the corresponding push button, or you can choose the **Get...** or **Edit...** push button to bring forward the Choose a Field or Variable dialog.

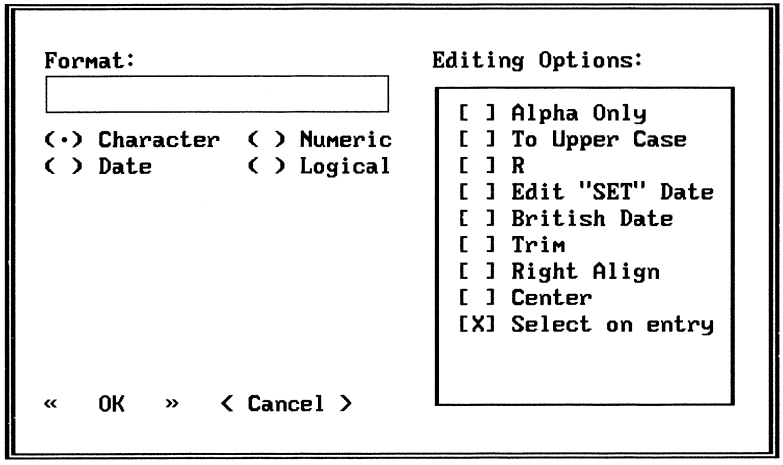
You can define fields from any open database. Enter `<alias.fieldname>` in the text box, or use the **Database** popup in the Choose a Field or Variable dialog.

When defining a GET expression, you may use any data type for display and editing. The **When...**, **Valid...**, **Message...**, **Error...** **Comment...** and **Disabled** check boxes are available. These options are described later in this chapter.

When you choose the **Edit** option, you may use only Character and Memo data types. All of the GET check boxes are available for EDIT fields with the addition of **Scroll bar** and **Allow tabs**. These options are described later in this chapter.

Format...

When an expression is displayed in the **Say/Get/Edit** text box, the **Format...** push button is active and a text box appears to its right. Choosing the **Format...** push button brings forward the Format dialog.



Format Dialog

The Format dialog for SAY, GET and EDIT fields allows you to specify automatic data editing options. Choose the appropriate check box to specify any of these default options. If any of the options are mutually exclusive of another, the corresponding option is disabled. These formatting commands, in conjunction with other data manipulation functions, let you design your output data in many ways.

Typical formatting of field data might include converting all alphabetical output to uppercase, inserting commas or decimal points in numeric output, or converting the American date format (mm/dd/yy) to British format (dd/mm/yy).

Formatting Options

The Format dialog displays editing options that are available for Character, Numeric, Date and Logical field types, or you can create a format template by entering characters in the Format text box. The formatting options available for each type of database field are listed in the tables on the following pages.

Character Data Formatting Options	
Option	**Output**
Alpha Only	Only alphabetic characters allowed.
To Upper Case	All characters are converted to upper-case.
R	Non-format characters are displayed but not stored.
Edit "SET" Date	Edit data as a date using the current SET DATE format.
British Date	Edit data as a European (BRITISH) date.
Trim	Remove all leading and trailing blank spaces.
Right Align	Data is printed flush right in field.
Center	Data is centered in field.
Select on Entry	Selects the entire field when cursor enters the field.

Numeric Data Formatting Options	
Option	**Output**
Left Justify	All numeric data for the specified field will begin at the leftmost position in the field.
Blank if Zero	If the field output is zero, the zero will not be printed.
(Negative)	Negative numbers will be placed in parentheses.
Edit "SET" Date	Edit data as a date using the current SET DATE format.
British Date	Edit data as a European (BRITISH) date.

Numeric Data Formatting Options	
Option	**Output**
CR if Positive	CR (credit) will appear after the number if the number is positive.
DB if Negative	DB (debit) will appear after the number if the number is negative.
Leading Zeros	Prints all leading zeros.
Currency	Displays currency format (as specified in the Misc panel of the View window or with the SET CURRENCY command).
Scientific	Displays in scientific notation (useful for very large or very small numbers).
Select on Entry	Selects the entire field when cursor enters the field.

Date Data Formatting Options	
Option	**Output**
Edit "SET" Date	Edit data as a date using the current SET DATE format.
British Date	Edit data as a European (BRITISH) date.
Select on Entry	Selects the entire field when cursor enters the field.

Logical Data Formatting Options	
Select on Entry	Selects the entire field when cursor enters the field.

Format Template

When you choose options in the Format dialog, the formatting codes are automatically entered in the Format line of the Screen Field dialog. You can, however, enter these codes yourself and bypass the Format dialog altogether.

A format template (the characters entered on the Format line) can include any desired characters. However, only the characters that are listed in the table below actively participate in the formatting of output. If any characters other than those listed below are entered in the format template, they will be displayed on output.

Code	Output
A	Displays only alphabetic characters.
K	Selects the entire field when cursor enters the field.
L	Displays logical data only.
N	Displays letters and digits only.
Y	Allows logical Y, y, N and n only. Converts y and n to Y and N, respectively.
X	Displays any character.
9	Displays digits only for character data. Displays digits and signs for numeric data.
#	Displays digits, blanks and signs.
$	Displays fixed dollar sign in front of the numeric value.
$$	Displays floating dollar sign in front of the numeric value.
*	Displays asterisks in front of the numeric value. This function may be used in combination with a $ for check protection.
!	Converts lower-case letters to upper-case.
.	Specifies decimal point position.
,	Separates digits left of the decimal point.

Range

The **Range** option is available only when a **Get** or **Edit** radio button is selected. The **Range** option may be used with character, date and numeric fields to specify a range of values within which input must lie. The values specified in the Range must be character, date or numeric expressions depending on the value of the corresponding data field.

Two check boxes, **Upper...** and **Lower...**, make up the Range section of this dialog. Choosing either of these check boxes brings forward the Code Snippet dialog. To set a range, define a valid expression or procedure using the Code Snippet dialog. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.



> Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator will automatically create a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

When you set a range it is not necessary to set both upper and lower boundaries. If one boundary is omitted, that portion of the range check is bypassed.

After the screen is generated, a message will be displayed whenever input is attempted with data that is not in the specified range. The message will display the correct range.

SAY Clauses and Options

The only options available for SAY fields are **Comment...** and **Refresh**.

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding documentation earlier in this chapter.

When **Refresh** is selected, a SHOW routine is generated for the READ. This routine refreshes the SAY fields and displays data for the next selected record.

GET Clauses and Options

The clauses available for GET fields are WHEN, VALID, MESSAGE and ERROR. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

For complete descriptions on these clauses, see the @...SAY/GET or @...EDIT sections of the FoxPro *Language Reference.*



> Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator will automatically create a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

Disabled

If **Disabled** is selected for a GET field, you will be unable to access the field upon generation. Data will be displayed, but the cursor will skip the field and editing of the field is prohibited.

Comment

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

EDIT Clauses and Options

All the clauses allowed for GET fields are allowed for EDIT fields. In addition, the **Scroll bar** and **Allow tabs** options are enabled.

Scroll Bar

Choosing the **Scroll bar** option places a scroll bar on the right side of all editing regions that are at least two lines deep. After generation, if data for the field is greater than the display area, the scroll bar allows the user to scroll up and down to view and edit all the data in the field.

Allow Tabs

Choosing the **Allow tabs** option allows the user to Tab in the EDIT field. To exit the field in the generated screen, the user must press Ctrl+Tab.



Tell the user how to exit an EDIT field by placing "Ctrl+Tab to Exit" in text just below the EDIT field.

Length...

When the **Edit** radio button is selected, the **Refresh** check box changes to **Length...**. Check this box to bring forward the Length dialog where you can specify the maximum number of characters that can be entered in the EDIT region in a screen.

Text

Display and edit text objects

Text can be used where words are required to make the screen easier to read and understand. The text appears in the screen exactly as it is typed. Text is treated as an object and can be selected, moved, stacked or deleted.

Creating Text

To create text, position the cursor in the Design window where you want the text to appear. Type the text and press Enter. Once you press Enter or reach the end of a row, the text becomes an object.

Editing Text

To edit a text object, Ctrl+click on the text with the mouse or select the text and choose **Text** from the **Screen** menu popup. The text is no longer treated as an object. Use FoxPro text editing techniques to make the desired changes. Press Enter when you are done editing to make the text an object.

You can enter comments for a text object. Double-click on the text object to bring forward the text dialog. The only option in this dialog is a **Comment...** check box. Choosing **Comment...** brings forward a Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

Push Button...

Define push buttons in the Design window

Push buttons allow you to get information from the user that typically initiates an action. The user chooses the desired button to perform an action described by the button's prompt. If push buttons are defined as terminating, input is ended when the user chooses the button.

Push buttons appear as a set of angle brackets surrounding the specified prompt. The prompt is the text that appears between the two angle brackets of the push button. Push button prompts can contain any desired characters except a quote or a semicolon. Prompts should contain information indicating the type of action that will take place when the button is chosen.

All buttons will be created the same size based on the length of the longest prompt. Spacing between the buttons is set to one line or space and can be changed through the Spacing dialog.

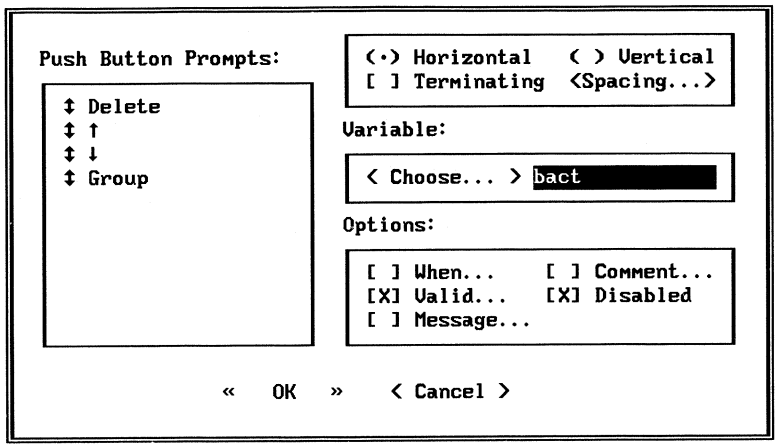
The number of push buttons that can be specified is limited only by the number that can fit on the screen and the 2048 character limit for the resulting command line.

The variable specified with the button may be a character or numeric memory variable or a character or numeric field in a database.

The value returned to this variable is determined by the button selected by the user. If a button is not selected, the variable will be set to 0 (zero).

Defining Push Buttons

To define push buttons, choose **Push Button...** from the **Screen** menu popup. The Push Button dialog appears.



Push Button Dialog

In the left portion of this dialog you specify the prompts for the push buttons. A prompt is the text that appears between the two angle brackets of the push button in the Design window and in the generated screen. Push button prompts can contain any desired characters except a quote or a semicolon.

To define a prompt:

1. Position the cursor in the first text box.

2. Enter the desired prompt and press Enter. When you press Enter, the cursor is positioned on the next line and you may enter the prompt of the next push button.

When you enter a push button prompt, a double-headed arrow appears to the left of the prompt.

Changing the Order of Push Buttons

When more than one button is specified, you can change the order of the buttons. to change the order of the buttons with the keyboard:

1. Press Tab until the prompt for the first push button is highlighted.

2. Press the Down Arrow key until the prompt for the button you wish to move is highlighted.

3. Press Ctrl+PgUp to move the prompt up in the list. Press Ctrl+PgDn to move the prompt down in the list. The button is now in a new location in the list and will appear in this location in the Design window and in the screen after generation.

If your keyboard supports the use of Ctrl+Arrow key combinations, you can press Ctrl+Up Arrow to move a prompt up in the list and Ctrl+Down Arrow to move a prompt down in the list.

To change the order with the mouse:

1. Click on the double-headed arrow and drag the button to the desired location.

2. Release the mouse button. The button is now in a new location in the list and will appear in this location in the Design window and in the screen after generation.

Defining Hot Keys and Default/Escape Push Buttons

Special characters can be used to define hot keys for push buttons, radio buttons and check boxes. Pressing a hot key in a generated screen positions the cursor on and selects the prompt of the object with which it is associated. Special characters can also be used to define a default or escape push button.

Hot Keys

When defining the prompts of the push buttons, you may define hot keys associated with the prompts by placing \< before the letter of the prompt that will be the hot key.

For example, you are defining a push button with the prompt "Save" and you would like the "S" to be the hot key. When entering the prompt in the Push Button Names section of the dialog, type:

```
\<Save
```

Upon generation, the "S" will be the hot key for the "Save" push button.

If you want to make the "v" in "Save" the hot key, you would type:

```
Sa\<ve
```

Upon generation, the "v" will be the hot key for the "Save" push button.

Default and Escape Push Buttons

Special characters can also be used to define a default or escape push button.

As in most FoxPro dialogs, the default push button is automatically chosen when the user presses Ctrl+Enter in the generated screen. Default push buttons appear in the Design window and in the generated screen with double angle brackets (« ») surrounding the prompt.

To define a default push button, enter a backslash and an exclamation point (\!) before the prompt when it is defined. For example, if you enter:

```
\!OK
```

«OK» will appear in the Design window and in the generated screen as the default push button.

You can define an escape push button that is automatically chosen when the user presses the Escape key in the generated screen. The escape button looks like any other push button in the Design window and in the generated screen.

To define an escape push button, enter a backslash and a question mark (\?) before the prompt when it is defined. For example, if you enter:

```
\?Cancel
```

Cancel will be designated as the escape push button even though it appears as all other push buttons in the Design window and in the generated screen.

When defining a default push button that also has a hot key, the special characters for the hot key must immediatly precede the hot key. For example:

```
\!\<OK
```

will make the "O" the hot key and the button will be the default push button for the screen.

Deleting Push Buttons

To delete one push button in a group with the keyboard:

1. Press Tab until the prompt for the first push button in the list is highlighted.
2. Press the Down Arrow key until the prompt for the button you wish to delete is highlighted.
3. Press Delete.

To delete one push button in a group with the mouse:

1. Click on the double-headed arrow to the left of the desired prompt to select it.
2. Press Delete.

To delete *all* push buttons in a group, select the object in the Screen Design window and press Backspace or Delete.

Terminating Push Buttons

When code is generated for a screen, objects are activated with the READ command and its various clauses.

Push buttons perform actions within a READ and are, by default, non-terminating buttons. When a button is non-terminating, all controls remain active and you can make further selections and enter additional data in the generated screen.

Examples of non-terminating buttons occur in FoxPro when push buttons are present in a window, such as the View window. When you choose a push button in the View window, the View window remains active and dialogs may come forward.

Terminating push buttons exit the READ and execute the next line in the controlling program.

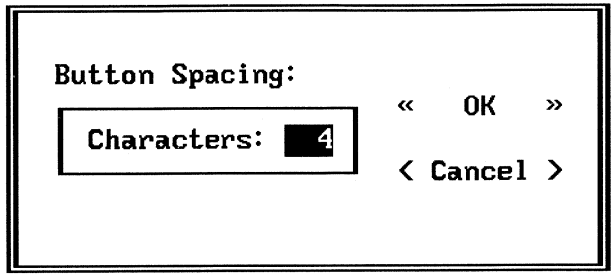
Examples of terminating push buttons occur in FoxPro dialogs. When you choose a terminating push button in a FoxPro dialog, the dialog is exited and you are returned to the previous level.



To keep your programs consistent, use non-terminating buttons in all windows that are non-modal. Define terminating push buttons in all modal dialogs. For more information refer to the FoxPro *Developer's Guide*.

Push Button Spacing

As described earlier, when push buttons are defined, there is one space between each button if they are defined horizontally and one line between them if they are defined vertically. To change the default spacing of the buttons, choose the **Spacing...** push button. The Spacing dialog appears.



Spacing Dialog

By default, the number 1 is displayed in the Characters text box. Select this text box and enter a new number. The push buttons will appear in the Design window with the specified number of spaces or lines between the buttons.

Sizing Push Buttons

By default, all push buttons that are defined together (associated with the same variable) are the size of the button with the longest prompt. Sizing push buttons changes the space between the prompt and the angle brackets. It does not change the space between the closing and opening brackets of two push buttons that are defined horizontally or the number of lines between push buttons that are defined vertically.

Push buttons can be sized only as small as the longest prompt of all push buttons. For example, if the longest prompt is 10 characters, all buttons are 10 characters wide. Prompts with less than 10 characters are padded with spaces.

If you modify the prompts of push buttons, their size does not change. If you modify the longest prompt in the previous example to be 5 characters, all buttons remain 10 characters wide and are padded with spaces. You must resize the buttons in the Screen Design window.

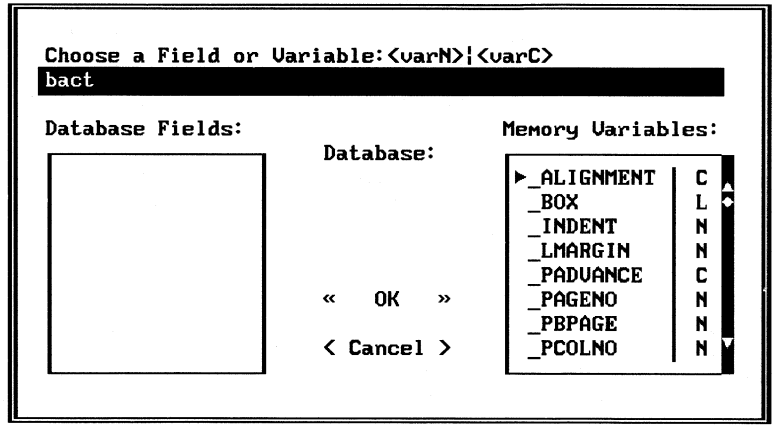
Use the standard sizing techniques to resize push buttons. For more information, see the section titled Screen Builder Objects earlier in this chapter.

Variable

The variable specified with push buttons can be a numeric or character memory variable or a numeric or character field in a database.

To define the variable, enter the variable name in the text box to the right of the **Choose...** push button. You can enter a variable name that has not yet been defined. If FoxPro can't find the specified memory variable, a memory variable with the specified name is automatically created and assigned a default value of 0 (zero).

Alternately, you can choose the **Choose...** push button to bring forward the Choose Field/Variable dialog. In this dialog you can choose a database field or an existing public memory variable.



Choose Field/Variable Dialog

To choose a field or variable with the keyboard:

1. Select the desired field or variable in the appropriate list.
2. Press Enter. The field or variable name appears in the text box at the top of the dialog.
3. Choose **OK** to return to the Push Button dialog. The field or variable name appears in the Variable section of the dialog.

To choose a field or variable with the mouse:

1. Double-click on the desired field or variable name in the appropriate list.
2. Choose **OK** to return to the Push Button dialog. The field or variable name appears in the Variable section of the dialog.

If the memory variable or database field is of numeric type, a number corresponding to your choice is stored to the variable or field. For example, if you create four push buttons and choose the third button, 3 is stored to the memory variable or field. If the variable or field is of character type, the prompt of the push button (with all special characters removed) is stored to the memory variable or field. Special characters are described earlier in this section.

Push Button Clauses and Options

The clauses available for push buttons are WHEN, VALID and MESSAGE. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

For a complete description of push buttons and associated clauses, see the @...SAY/GET or @...GET — Push Buttons command in the FoxPro *Language Reference.*



> Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator automatically creates a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

Disabled

If **Disabled** is checked for push buttons, you will be unable to access the buttons in the generated screen. The buttons are displayed, but the cursor will skip the buttons and the buttons cannot be chosen.

Comment

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

Radio Button...

Define radio buttons in the Screen Design window

Radio buttons allow you to get information from the user that typically indicates an action or option.

Radio buttons usually occur in groups. They appear as a set of parentheses with one space between. When the radio button is turned on, a dot appears in the space between the parentheses.

Radio buttons, like push buttons, are accompanied by text that identifies the action or value associated with each button. At any given time, exactly one button in the group is on. When the user selects another button in the group, the newly selected button turns on and the button that was previously selected turns off.

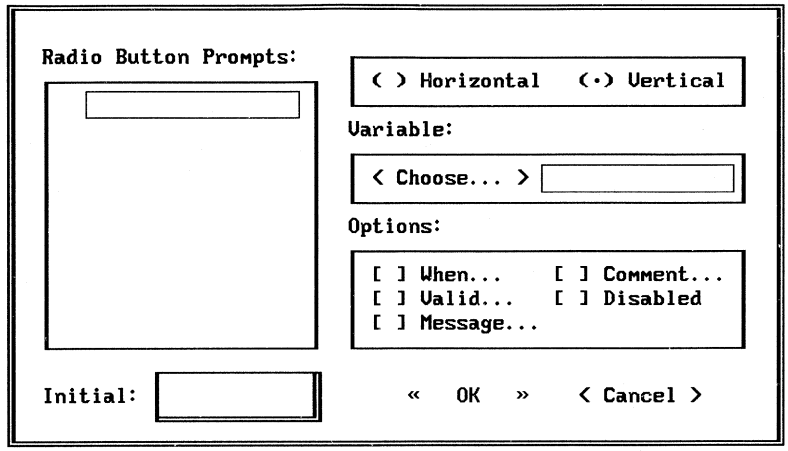
Radio buttons are automatically treated as non-terminating buttons. For a description on terminating buttons versus non-terminating buttons, see Terminating Push Buttons in the push button section of this chapter.

The number of radio buttons that can be specified is limited only by the number that can fit on the screen and the 2048 character limit for the resulting command line.

The variable specified with the button may be a character or numeric memory variable or a character or numeric field in a database. The value returned to this variable is determined by the button selected by the user.

Defining Radio Buttons

To define radio buttons, choose **Radio Button...** from the **Screen** menu popup. The Radio Button dialog appears.



Radio Button Dialog

In the left portion of this dialog you will specify the prompt for each radio button. The prompt is the text that will appear to the right of the parentheses of the radio button in the Design window and in the generated screen. Radio button prompts may contain any desired characters except a quote or a semicolon.

Radio button prompts are defined and manipulated in the same manner as push button prompts. For more information, see the section titled Defining Push Buttons earlier in this chapter.

Defining Hot Keys

Special characters allow you to define hot keys for push buttons, radio buttons and check boxes. Pressing a hot key in a generated screen positions the cursor on and selects the prompt of the object with which it is associated.

Hot keys for radio buttons are defined in the same manner as hot keys for push buttons. For more information, see the section titled Defining Hot Keys for push buttons earlier in this chapter.

Deleting Radio Buttons

Radio buttons are deleted in the same manner as push buttons. You can delete one radio button from a group of radio buttons, or you can delete all radio buttons in a group. For more information, see the section titled Deleting Push Buttons earlier in this chapter.

Spacing

Radio buttons may be displayed either vertically or horizontally in the screen. Choose the appropriate radio button in the Radio Button dialog for the desired display.

Spacing between the buttons is set to one space for horizontal buttons and zero lines for vertical buttons. You can change the horizontal spacing of buttons.

To change the spacing of radio buttons, use the same techniques as for sizing an object in the Screen Design window. For more information, see the section titled Screen Builder Objects earlier in this chapter.

You must have enough lines defined in your screen or window to allow at least one space between each button before you try to increase the spacing. If the screen or window definition is too small, the buttons will blink when they are selected for spacing, but you will not be able to increase the spacing.

Variable

The variable specified with push buttons can be a numeric or character memory variable or a numeric or character field in a database.

Use the same techniques to define a variable for radio buttons that you use to define a variable for push buttons. For more information, see the push button variable section earlier in this chapter.

If the memory variable or database field is of numeric type, a number corresponding to your choice is stored to the variable or field. For example, if you create four push buttons and choose the third button, 3 is stored to the memory variable or field. If the variable or field is of character type, the prompt of the push button (with all "special" characters removed) is stored to the memory variable or field. Special characters are described earlier in this section.

Radio Button Clauses and Options

The clauses available for radio buttons are WHEN, VALID and MESSAGE. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

For a complete description on radio buttons and their associated clauses, see the @...SAY/GET or @...GET — Radio Buttons sections of the FoxPro *Language Reference.*



> Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator will automatically create a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

Disabled

If **Disabled** is checked for radio buttons, you will be unable to access the radio buttons upon generation. The radio buttons will be displayed, but the cursor will skip the buttons and they cannot be chosen.

Comments

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

Initial

In the lower left corner of the Radio Button dialog is the **Initial** popup. This is the value with which the variable is initialized during generation. By default, this value is 1 (the name of the first prompt in the list).

The name of the first defined prompt is displayed in the popup control, and any prompts defined in this dialog are displayed when you choose the popup control. When you choose a prompt from the popup, the chosen prompt is then displayed on the popup control. This prompt will appear as the selected radio button in the Design window and in the generated screen when it is first displayed.

Check Box...

Define check boxes in the Screen Design window

Check boxes appear singly or in small groups and act like toggle switches. They're used to indicate a state that is one of two values, such as on or off.

A check box appears as a left bracket and a right bracket with a space between them. When the check box is chosen, an "X" toggles on or off. Typically, if the box is checked, the indication is that the state is on; otherwise it's off.

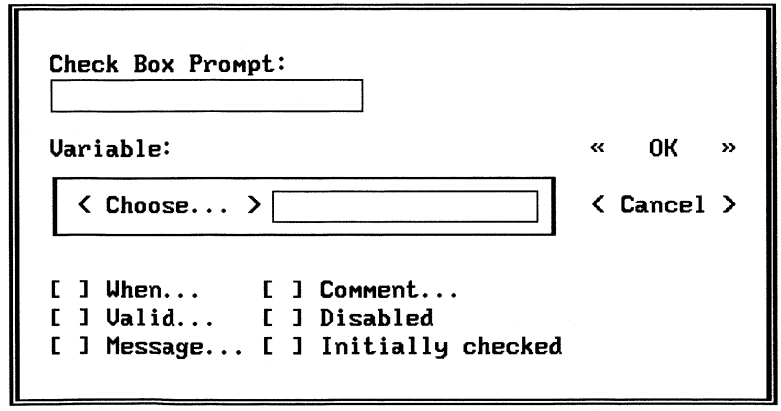
Check boxes act as individual objects in the Design window. They can be selected then moved, stacked or deleted independently of all other objects (including other check boxes).

Check boxes that appear together in a given screen act independently of each other. Any number of a group of check boxes may be on or off at a given time. Though check boxes may appear in groups, they are defined individually and can be assigned clauses independently of other check boxes.

Defining a Check Box

To place a check box in the design window:

1. Place the cursor in the desired location and choose **Check Box** from the **Screen** menu popup. The Check Box dialog appears.



Check Box Dialog

At the top of this dialog is a text box for the prompt of the check box. This is the text that will appear to the right of the check box brackets in the Design window and in the generated screen.

2. Enter the prompt for the check box.

Defining Hot Keys

Special characters allow you to define hot keys for push buttons, radio buttons and check boxes. Pressing a hot key in a generated screen positions the cursor on and selects the prompt of the object with which it is associated.

Hot keys for check boxes are defined in the same manner as hot keys for push buttons. For more information, see the section titled Defining Hot Keys for push buttons earlier in this chapter.

Variable

The variable specified with check boxes may be a numeric or logical memory variable or a numeric or logical field in a database.

Use the same techniques to define a variable for check boxes that you use to define a variable for push buttons. For more information, see the Variable topic in the push button section earlier in this chapter.

If the memory variable or database field is of numeric type, a number corresponding to your choice is stored to the variable or field. For example, if you create four push buttons and choose the third button, 3 is stored to the memory variable or field. If the variable or field is of character type, the prompt of the push button (with all "special" characters removed) is stored to the memory variable or field. Special characters are described earlier in this section.

The value returned depends on the variable type that is associated with the control. An unchecked box corresponds to the value of 0 or ".F." and a checked box corresponds to a value of 1 or ".T.".

Check Box Clauses and Options

The clauses available for check boxes are WHEN, VALID, and MESSAGE. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

For a complete description on check boxes and the associated clauses, see the @...SAY/GET or @...GET — Check Boxes sections of the FoxPro *Language Reference.*



Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator automatically creates a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

Disabled

If **Disabled** is checked for a check box, you will be unable to access the check box upon generation. The check box is displayed, but the cursor will skip the check box and it cannot be chosen.

Comment

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding documentation earlier in this chapter.

Initially Checked

The **Initially checked** check box assigns a default value to the defined check box. Checking this box will make the defined check box appear selected in the Design window and in the generated screen. Leaving the check box unchecked will cause it to appear deselected in the Design window and in the generated screen.

Popup...

Define popups in the Design window

Popups are used for setting values or choosing from a list of related items. Popups are represented by a box with a double line on the right and bottom borders. A value is displayed in the box. When the user chooses this popup control in an input screen, the popup appears.

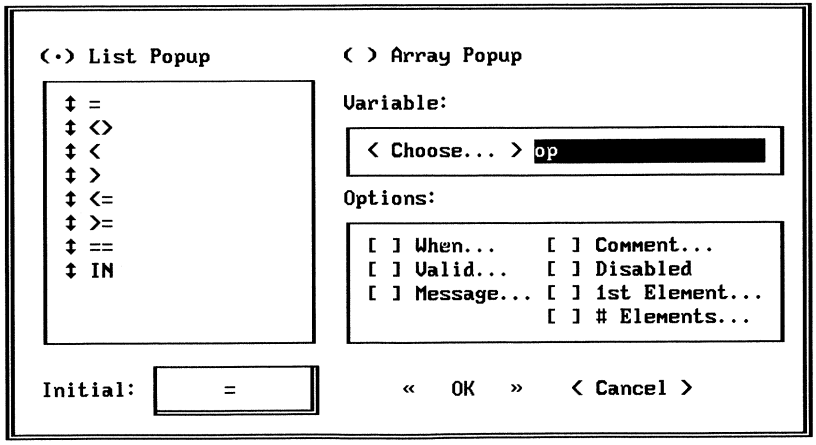
A popup may be defined as either a list popup or an array popup. In a list popup, you will define all the items that appear in the menu popup. These items remain intact every time you use the generated screen.

With an array popup, you DIMENSION the array in your setup code (described in the Screen Layout section of this chapter). The elements in the array can be defined in a variety of ways. For more information on arrays, see the Arrays chapter in the FoxPro *Developer's Guide*.

Options in the Popup dialog allow you to determine the contents of the first element of the array and the number of elements in the array. These options are described later in this section.

Defining a List Popup

To define a list popup, place the cursor in the desired position in the Design window and choose **Popup...** from the **Screen** menu popup. The Popup dialog appears.



Popup Dialog

At the top of this dialog are two radio buttons — **List Popup** and **Array Popup**. Choose the **List Popup** radio button.

In the left portion of this dialog you specify the prompt of the popup options. The prompt is the text that will appear in the popup. Popup prompts may contain any desired characters except a quote or a semicolon.

Define the prompts for a list popup in the same manner you define prompts for push buttons. For more information, see the section titled Defining Push Buttons earlier in this chapter.

Changing the Order of Prompts

Use the same techniques to change the order of list popup prompts that you use to change the order of push button prompts. For more information, see the section titled Changing the Order of Push Buttons earlier in this chapter.

Deleting Prompts

Delete one prompt in a list popup or the entire popup in the same manner you delete push buttons. For more information, see the section titled Deleting Push Buttons earlier in this chapter.

Variable

The variable specified with popups may be a numeric or character memory variable or a numeric or character field in a database.

Define a variable for a list popup in the same manner you define a variable for push buttons. For more information, see the section on push button variables earlier in this chapter.

If the memory variable or database field is of numeric type, a number corresponding to your choice is stored to the variable or field. For example, if you create four popup options and choose the third option, 3 is stored to the memory variable or field. If the variable or field is of character type, the prompt of the option is stored to the memory variable or field.

Popup Clauses and Options

The clauses available for popups are WHEN, VALID, and MESSAGE. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

For a complete description on popups and the associated clauses, see the @...SAY/GET or @...GET — Popups sections of the FoxPro *Language Reference.*



Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator automatically creates a unique name for each procedure at the object level. This unique name is inserted in the code with as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

Disabled

If **Disabled** is checked for a popup, you will be unable to access the popup upon generation. Data is displayed, but the cursor skips the popup and it cannot be chosen.

Comment

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

Initial

In the lower left corner of the Menu Popup dialog is the **Initial** popup. The initial value is the popup prompt that is shown on the popup control when the generated screen is first displayed.

The name of the first defined prompt is displayed on the popup control, and any prompts defined in this dialog are displayed when you choose the popup control. When you choose a prompt from the popup, the chosen prompt is then displayed on the popup control object in the Design window and will appear on the popup control when the generated screen is first displayed.

Defining an Array Popup

To define an array popup, choose the **Array Popup** radio button and the top of the Popup dialog. All the options on the left side of the dialog are disabled.

Enter the name of the array in the text box next to the **Array Popup** radio button. Assign the array a database field or memory variable as described in the Variable section. The name of this variable appears in the popup in the Design window.

All the clauses available for a list popup are available for an array popup. In addition, the **1st Element...** and **# Elements...** check boxes are enabled.

Use these options to define the first element in the array and the number of elements in the array. These options operate identically to the clause options described earlier in this chapter.



Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator automatically creates a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

For more information on array popups, see the @...GET — Popups sections of the FoxPro *Language Reference* or the appropriate sections of the FoxPro *Developer's Guide*.

Sizing a Popup

When you have entered the desired information in the Popup dialog, choose **OK** to return to the Screen Design window.

If the popup is defined as a list popup, the popup control will be the width of the longest defined prompt. If you modify the prompts in a list popup, the width of the popup control will not change. You must resize the popup control in the Screen Design window.

If the popup is defined as an array popup, the popup control will be 10 characters wide by default. You may resize the popup control in the Screen Design window.

Size a popup with the same techniques you use to size any object in the Screen Design window. For more information, see the section titled Screen Builder Objects earlier in this chapter.

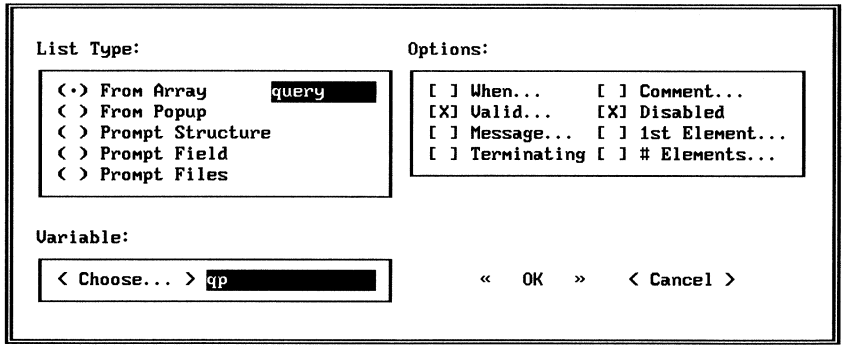
List...

Define a list in the Design window

The items that will be displayed in a list come from an array, a popup, the structure of a database, the records in a specific field in a database or specific files on a disk.

Defining a List

To define a list, choose **List...** from the **Screen** menu popup. The List dialog appears.



List Dialog

At the top of this dialog are five radio buttons that allow you to define the contents of the list.

From Array

Choose the **From Array** radio button to define a list from an array. Enter the name of the array in the text box to the right of the **From Array** radio button.

When you define a list from an array, the array must be dimensioned and the array items declared before using a list. For information on arrays, see the Arrays chapter in the FoxPro *Developer's Guide*.

From Popup

Choose the **From Popup** radio button to define the items in the list from an existing popup. Enter the name of the popup in the text box to the right of the **From Popup**.

When you define a list from a popup, the popup must be defined prior to the execution of the line of code that defines the list. You can define the popup in the Setup code for the screen (described earlier in this chapter) or in a menu program that is executed prior to the format statements for the screen program.

Items in the list will be the same items in the defined popup.

Prompt Structure

Choosing the **Prompt Structure** radio button places a database structure into a list. The fields of the selected database file become the options in the list.

Prompt Field

When you choose the **Prompt Field** radio button, you can specify a field from an open database file in the text box to the right of the **Prompt Field** radio button. The data from that field in every record become the options in the list. To specify a field from any open database, precede the field name with the work area alias.

Prompt Files

Choose the **Prompt Files** radio button to create a list to display files that are available on disk. In the text box to the right of the **Prompt Files** radio button, you may enter an additional LIKE clause to selectively place files in the popup. The file specification skeleton supports wild card characters. By default, *.* is displayed in this text box.

For example, to create a list that displays database files from the default drive and directory, choose the **Prompt Files** radio button and enter *.DBF in the text box. You can create a list that displays files on other drives and directories by including a drive specification, a directory specification or both. For example, to create a list that displays program files from a directory called PROGRAMS on drive A, choose the **Prompt Files** radio button and enter A:\PROGRAMS*.PRG in the text box.

Variable

The variable specified with lists may be a numeric or character memory variable or a numeric or character field in a database.

Define a variable for a list in the same manner you define a variable for push buttons. For more information, see the Variables topic in the push buttons section earlier in this chapter.

List Clauses and Options

The clauses available for lists are WHEN, VALID and MESSAGE. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects earlier in this chapter.

For a complete description on lists and the associated clauses, see the @...SAY/GET or @...GET — List sections of the FoxPro *Language Reference.*

The **1st Element...** and **# Elements...** check boxes are available when the list is defined from an array. These options bring forward dialogs so you can specify the first element in the array and the number of elements in the array.

If the defined array is one dimensional, **1st Element...** is 1 by default. If **# Elements...** is not specified, the entire array is used.

For information on arrays, refer to the FoxPro *Developer's Guide.*



> Do not enter a PROCEDURE or FUNCTION command when writing code snippets for clauses at the object level.

The screen generator automatically creates a unique name for each procedure at the object level. This unique name is inserted in the code as the value for the specified clause. The procedure file with this unique name and the code snippet you write is generated at the end of the program file.

Disabled

If **Disabled** is checked for a list, you will be unable to access the list upon generation. Data is displayed, but the cursor skips the list and it cannot be edited.

Comments

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the corresponding section earlier in this chapter.

Sizing a New List

When the desired options have been selected and the list has been defined, choose **OK** in the List dialog to return to the Design window.

The list appears in the design window and is 10 characters wide by 4 rows deep. This list blinks to show that it is immediately available for sizing.

To size a new list with the keyboard:

1. With the cursor positioned on the list, press Ctrl+Spacebar. The list blinks to show that it is selected for sizing.
2. Use the arrow keys to make the list the desired size.
3. Press Enter to confirm the action.

To size a new list with the mouse:

1. Ctrl+click on the list.
2. Hold down the mouse button and drag the mouse until the list is the desired size.
3. Release the mouse button.

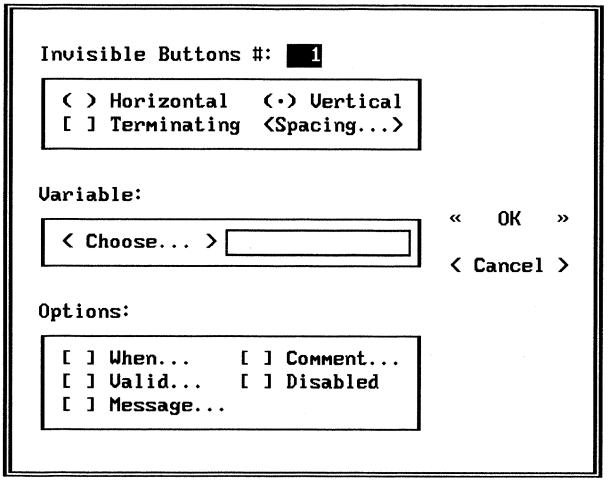
Only the right and bottom edges of the list expand or shrink. You can move the list after you have sized it.

Inv. Button...

Define invisible buttons in the Design window

Invisible buttons are rectangular regions of the screen or a window that you can select and choose. They are similar to push buttons in that they typically initiate an action.

Invisible buttons usually lie on top of text objects that describe the button's action. If invisible buttons are defined as terminating, input is ended when the user chooses the button. To define invisible buttons, choose **Inv. Button...** on the **Screen** menu popup. The Invisible Button dialog appears.



Invisible Button Dialog

By default, the size of invisible buttons is one row by 10 columns. Invisible buttons can be resized using standard object sizing techniques (Ctrl+click on the button and drag or use the arrow keys until the buttons are the desired size). Spacing between the buttons is set to one line or space and can be changed through the Spacing dialog.

The variable specified with the button may be a character or numeric memory variable or a character or numeric field in a database.

The value returned to this variable is determined by the button selected by the user. If a button is not selected, the variable will be set to 0 (zero).

Group vs. Individual Invisible Buttons

Invisible buttons can be defined individually or as a group. At the top of the Invisible Button dialog, you specify the number of invisible buttons you wish to define. Invisible buttons can be defined individually or as a group.

When you define invisible buttons as a group, all buttons appear in the same row or column. When you size the buttons, all buttons in the group are sized to the same dimensions.

When you define invisible buttons individually, you can size and position the buttons independently. If you want to use invisible buttons at random locations and varying sizes in a screen, you should define the buttons individually.

Terminating Invisible Buttons

When code is generated for a screen, objects are activated with the READ command and its various clauses.

Invisible buttons perform actions within a READ and are, by default, non-terminating buttons. When a button is non-terminating, all controls remain active and you can make further selections and enter additional data in the generated screen.

Terminating invisible buttons exit the READ and execute the next line in the controlling program.

Invisible Button Spacing

As described earlier, when invisible buttons are defined in a group, there is one space between each button if they are defined horizontally and one line between them if they are defined vertically. To change the default spacing of the buttons, choose the **Spacing...** push button. The Spacing dialog appears.

By default, the number 1 is displayed in the Characters text box. Select this text box and enter a new number. The invisible buttons will appear in the Design window with the specified number of spaces or lines between the buttons.

Sizing Invisible Buttons

By default, the size of invisible buttons is one row by 10 columns. Invisible buttons can be resized using standard object sizing techniques. Use the standard sizing techniques to resize invisible buttons.

Variable

The variable specified with invisible buttons may be a numeric or character memory variable or a numeric or character field in a database.

To define the variable, enter the variable name in the text box to the right of the **Choose...** push button. You can enter a variable name that has not yet been defined. If FoxPro can't find the specified memory variable, a memory variable with the specified name is automatically created and assigned a default value of 0 (zero).

Alternately, you can choose the **Choose...** push button to bring forward the Choose Field/Variable dialog. In this dialog you can choose a database field or an existing public memory variable.

If the memory variable or database field is of numeric type, a number corresponding to your choice is stored to the variable or field. For example, if you create four invisible buttons and choose the third button, 3 is stored to the memory variable or field.

Invisible Button Clauses and Options

The clauses available for invisible buttons are WHEN, VALID and MESSAGE. For a complete description on how to define code snippets for clauses, see the section on Assigning Code Snippets to Objects in the Screen Builder chapter of the FoxPro *User's Guide.*

For a complete description of invisible buttons and associated clauses, see the @...SAY/GET or @...GET — Invisible Buttons command in the FoxPro *Language Reference.*

Disabled

If **Disabled** is checked for invisible buttons, you will be unable to access the buttons in the generated screen. The buttons are defined, but the cursor will skip the buttons and the buttons cannot be chosen. Code that defines the behavior of other objects in the screen can enable disabled buttons.

Comment

Choosing **Comment...** brings forward the Comment dialog. For a complete description of this option, see the Screen Builder chapter of the FoxPro *User's Guide.*

Design Considerations

Bring to Front/Send to Back

Change stacking order of objects

These two options allow you to change the stacking order (front to back) of controls, text, lines and boxes as they appear on your screen. You might draw a box over a line of text, but want the text to be displayed over the box.

Select the desired object in the Design window then choose the appropriate stacking option from the **Screen** menu popup. Multiple objects can be selected then stacked.

Bring to Front and **Send to Back** also change the numerical order of the objects, thereby changing the order in which they are accessed in the generated screen. **Group** and **Reorder Fields** also change the order in which fields are accessed in the generated screen. See the sections on Group and Reorder Fields in this chapter to determine which method best suits your need.



Defining the access order of fields and controls should be a one-time-only event and the final step in defining a screen. Use this option *after all fields and controls have been defined.* You do not need to redefine the access order of a screen unless you have added new objects to the Design window or you want to access the objects in an order other than that which is defined.

Access Order of Objects

With a mouse, users can point and click on any field or control in any order they like. Keyboard users do not have this luxury. It is important to consider these users and design your screens with this knowledge.

When you press Tab to move the cursor from object to object in a generated screen, objects are accessed in the order they appear in the .SCX database. Records are entered into the database in the order that they are drawn in the Design window.

You might not draw your objects in the order you want them to be accessed upon generation. For example, you may place all your GET fields in many different parts of the Design window, and then define your controls (in random order).

Without reordering your fields, the cursor may jump around the generated screen, first accessing your GET fields (in the order they were defined) and then accessing the controls (in the order they were defined). Fields are numbered in the Design window. Although controls are not numbered, the order in which they are accessed is affected by the **Bring to Front** and **Send to Back** options.

It is best to access your fields and controls in a consistent order throughout your screens (such as left-to-right, top-to-bottom). The **Bring to Front** and **Send to Back** options can reorder the objects in any sequence you desire.

Reordering Objects with Bring to Front

The topmost object in the Design window is the last one drawn and the last record in the .SCX database. **Bring to Front** makes the selected object(s) the last one(s) drawn in the Design window and changes the order of the records in the .SCX, database making the selected object(s) the last record(s) in the database.

Objects are reordered in the order they are selected (with the mouse or the keyboard). Only the numbers associated with the GET fields change to reflect the new order. Any controls that are selected are accessed in the selected order and the numbers of any GET fields that are ordered after a control reflect this.

For example, if you define a field, then a control, then another field, the first field displays number 1, the control is number 2 (although this number is not displayed in the design window) and the other field displays number 3. No number 2 appears in the Design window.

Objects that are reordered with this option become the highest numbered objects in the Design window. They are the last records in the .SCX database.

The examples below use as a scenario a screen with GET fields numbered 1 through 10. The screen also has a set of radio buttons, a set of push buttons and a check box.

Example 1

1. Fields 7, 3 and 5 are selected (in that order).
2. **Bring to Front** is chosen from the **Screen** menu popup.
3. Field 7 becomes field 11, field 3 becomes field 12 and field 5 becomes field 13. Remember, even though the controls are not numbered, they play a part in the numerical order.

Example 2

1. Field 4, the radio buttons, and field 5 are selected (in that order).
2. **Bring to Front** is chosen from the **Screen** menu popup.
3. Field 4 becomes field 11, the radio buttons become number 12 (although they are not numbered in the Design window), and field 5 becomes field 13.



Choose the specific order you want your fields and controls accessed in the generated screen.

4. Select all the fields and controls in the Design window one by one in the order you want them accessed in the generated screen.
5. Choose **Bring to Front** from the **Screen** menu popup.

The objects now appear in the numerical order you selected them, they are in this order in the .SCX database, and they will be accessed in this order in the generated screen.

Reordering Objects with Send to Back

Reordering objects with the **Send to Back** option works exactly opposite of the **Bring to Front** option. When you use this option, the selected field(s) become the first ones drawn and they become the first records in the .SCX database. They will then be the first fields and controls accessed in the generated screens.

The examples below use the same scenario as the examples for **Bring to Front**. A screen has GET fields numbered 1 through 10. The screen also has a set of radio buttons, a set of push buttons and a check box.

Example 1

1. Fields 7, 3 and 5 are selected (in that order).
2. **Send to Back** is chosen from the **Screen** menu popup.
3. Field 7 becomes field 1, field 3 becomes field 2 and field 5 becomes field 3.

Example 2

1. Field 4, the radio buttons, and field 5 are selected (in that order).
2. **Send to Back** is chosen from the **Screen** menu popup.
3. Field 4 becomes field 1, the radio buttons become number 2 (although they are not numbered in the Design window), and field 5 becomes field 3.

Center

Center objects

Center places an object in the center of a line in the defined screen or window. The screen or window size is determined in the Screen Layout dialog described earlier in this section.

Do not confuse this option with the **Center** option in the Screen Layout dialog. The **Center** option in the Screen Layout dialog displays the defined screen in the center of your monitor. **Center** on the **Screen** menu popup places the defined object in the center of a line in your screen or window.

Select the object that you want to center and choose **Center** from the **Screen** menu popup. The selected object is automatically moved to the center of the line on which it is located.

If you select multiple objects and choose **Center**, each selected object will be centered relative to the width of the screen. If multiple objects are selected in the same row of the screen, the objects will center and lay on top of one another.

If you would like to center multiple objects in the same row, but keep their spacing in relation to each other, you must first group the objects. When you group multiple objects, they then act as one object. When you choose **Center** to center a grouped object, the grouped object is centered on the specified row in the screen. Grouping objects is described later in this chapter.

Reorder Fields

Changes the order in which objects are accessed

When you place objects in the Design window they will later be accessed in the order they are defined. You can change this order with the **Reorder Fields** option on the **Screen** menu popup.

If you select all the objects in the Design window and choose the **Reorder Fields** option they will be ordered and accessed from left to right, top to bottom. Selecting an individual object and choosing this option will place it at the end of the order.

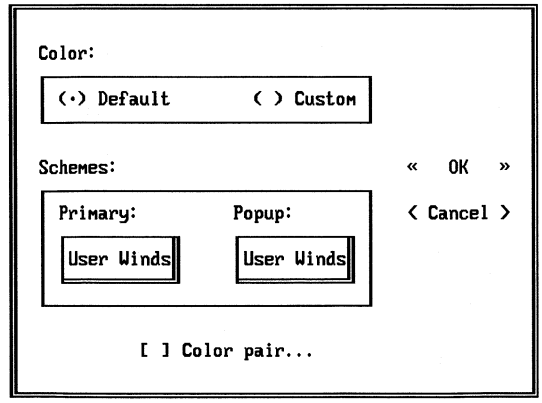
Objects that are grouped may not renumber in this order. See the section on Grouping later in this chapter.

For information on how fields and controls are numbered, see the Bring to Front section earlier in this chapter.

Color...

Assign color attributes to objects in the Design window

Every object in the Design window can be assigned a different color scheme. To use this option, select the object or objects in the Design window and choose **Color...** from the Screen menu popup. The Screen Color Picker dialog appears.



Screen Color Picker Dialog

This dialog has two radio buttons — **Default** and **Custom**. Default colors are automatically assigned to Screen Builder objects. The default color scheme is assigned in the Screen Layout dialog. When you choose the **Custom** radio button, the **Scheme** popups and **Color Pair...** check box are enabled (depending on the object type selected).

To define a color scheme for a specific object:

1. Select the desired object in the Screen Layout window.
2. Choose **Color...** on the **Screen** menu popup. The Screen Color dialog appears with the **Default** radio button is selected.
3. Choose the **Custom** radio button to assign a new color scheme to the object.

Different color options are enabled in this dialog corresponding to the object type selected.

If the selected object is a box, line, text object or SAY field, the **Primary** popup and the **Color pair...** check box are enabled. You can assign a pre-defined color scheme to the object with the **Primary** popup, or you can choose the **Color pair...** check box to bring forward the Screen Color Picker where you can specify a color pair for the object.

If you specify a color scheme *and* a color pair, the color pair is used to define the color for the object.

If the selected object is any other object *except* a popup, only the **Primary** popup is enabled. You can assign a pre-defined color scheme to the object with the **Primary** popup.

If the selected object is a popup, the **Primary** popup and the **Popup** popup are enabled. The scheme selected from the **Primary** popup defines the color of the popup control and the scheme selected from the **Popup** popup defines the color of popup when it is displayed.

If multiple objects of different types are selected, all options in the Screen Color dialog are enabled, but only information appropriate for each object type is saved with the object.

You can define custom color schemes using the Color Picker. For information on the Color Picker, see the Window Menu chapter in this manual.

Tips on Using Color

- Use color as a supplementary feature to provide extra information for those users who have color capability.
- Colors look best against a background of neutral gray. Studies have shown colored text is harder to read than black text on a white background. Beware of light shades of blue, which are generally the most illegible of all colors.
- Remember that you should never use color alone for distinguishing objects — not everyone has a color monitor.

For more information on color and color schemes, see the FoxPro *Installation and Configuration* manual.

Group and Ungroup

Combine multiple objects into one object

Group and **Ungroup** allow you to take a collection of individual objects and create a single object, or take a grouped object and divide it back into its individual pieces. This makes it easy to manipulate a complex collection of objects as a single object while retaining the object stacking order in relation to each other. The group as a whole takes the stacking order of the frontmost object in the Design window.

It is important to realize that grouping objects reorders them. The **Group** and **Ungroup** options should not be used to define the order in which fields and controls are accessed in the generated screen. Use the **Reorder Fields** or **Bring to Front** options (described earlier) to define the access order of your screens.

How Grouping Reorders Objects

When you group fields and controls in the Design window, the grouped objects are reordered sequentially left-to-right, top-to bottom beginning with the lowest numbered object in the group. The order in which they are selected does not matter.

The examples below uses the same scenario as the examples for **Bring to Front** (described above). A screen has GET fields numbered 1 through 10. The screen also has a set of radio buttons, a set of push buttons and a check box. The fields are numbered sequentially left-to-right, top-to-bottom.

Example 1

1. Fields 3, 5 and 7 are selected (in any order).
2. **Group** is chosen from the **Screen** menu popup.
3. Field 3 remains field 3, field 5 becomes field 4 and field 7 becomes field 5. All other fields reorder to reflect this change.

Example 2

1. Field 4, the radio buttons, and field 5 are selected (in any order).
2. **Group** is chosen from the **Screen** menu popup.
3. Field 4 remains field 4, the radio buttons become number 5 (although it is not numbered in the Design window), and field 5 becomes field 6.

Grouping with Text Objects

Every text object in the Design window has a corresponding record in the .SCX database. Although text objects are not numbered and are not accessed in the generated screen, they do play a part in the reordering of grouped objects.

If a text object and the field or control with which it is associated are defined in sequence, the records follow each other in the .SCX database. Grouping will not change the numerical order of the field or control.

When objects are reordered with the **Reorder Fields** option on the **Screen** menu popup, text objects that are selected are moved to the top of the .SCX database. Although they are not numbered objects, they have lower record numbers in the database than numbered fields and controls.

Grouping text objects with fields or controls may not produce the result you anticipated. Many factors can affect the order of the objects, including:

- Adding new objects to the Design window after the reordering process
- Reordering specific objects in the Design window
- Changing the location of objects in the Design window

- Using the **Bring to Front** or **Send to Back** options before grouping



Use the **Group** option for design purposes only. Do not use this option specifically for ordering your fields and controls. Use the **Bring to Front** and **Reorder Fields** options for defining the access order of your screens.

Group Boxes

If two or more boxes overlap in a screen, you can join the boxes so that the lines are joined where the boxes intersect. This gives screens a clean, crisp appearance.

To join boxes in screens:

1. Select the boxes you wish to join in the Screen Design window. When two or more boxes are selected, the **Group** option on the **Screen** menu popup changes to **Group Boxes.**
2. Choose **Group Boxes** on the **Screen** menu popup. The boxes are grouped and the lines are joined.

If boxes are selected with other objects (not boxes), they can be grouped, but the lines will not be joined. To enable the **Group Boxes** option, only boxes can be selected.

If you would like to group overlapping boxes, but *not* join the lines:

1. Select the boxes you want to group in the Screen Design window.
2. Hold down the Shift key when you choose the **Screen** menu pad. The **Group** option will not change to **Group Boxes** when the Shift key is depressed. Boxes are grouped and act as one object, but the lines are not joined.

Ungroup

The **Ungroup** option on the **Screen** menu popup will divide a grouped object back into the individual or smaller groups that it is composed of. When a grouped object has other smaller groups in it, ungrouping the larger object will not ungroup the smaller groups. When a grouped object is ungrouped, the objects of the group remain selected and keep their stacking and numerical order.

Quick Screen...

Automatically place selected fields in Design window

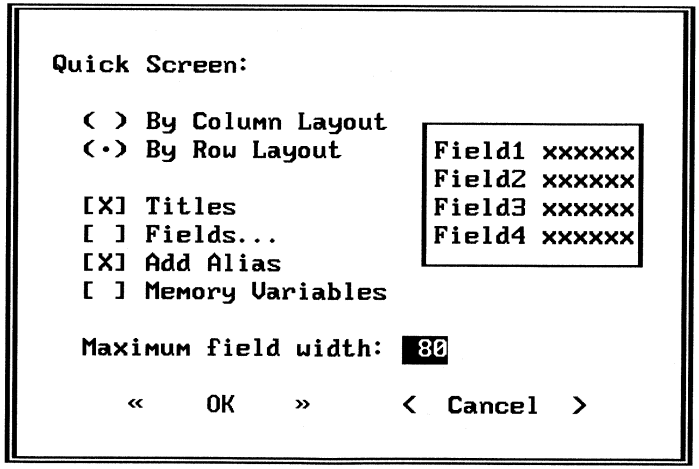
Quick Screen... is a feature of the Screen Builder that automatically places specified fields in the Design window. All you need to do is position them and insert text or graphics to finish creating the screen. Choose **Quick Screen...** to bring forward the Quick Screen dialog.

This option is available only when the Design window is empty (it contains no objects).

Layout

Quick Screen offers two field placement options — **By Column Layout** and **By Row Layout**.

- **By Column Layout** displays the fields from left to right across the screen. If there are more fields than you have room for in the defined area for the screen, the fields wrap to the following lines.
- **By Row Layout** displays the fields one below the other. If there are more fields than you have room for in the defined area for the screen, some fields will not be displayed.



Quick Screen Dialog

Titles

The **Titles** check box determines whether or not field names will be displayed as titles next to the corresponding field. If you choose the **Column Layout** format, the field names are displayed to the left of the fields across the screen. With **Form Layout**, the field names are displayed to the left of the fields that appear one below the other down the screen.

Fields...

When **Fields...** is checked, the Field Picker dialog appears.

This is the same dialog you use when you want to display specific fields in the Browse window or when you specify a fields list for other commands. In this case, you use it to display specific fields in your screen. For more information on the Field Picker dialog, see the Database Menu chapter of this manual.

Add Alias

When the **Add Alias** check box is checked, the alias is automatically added to all field names in the Screen Design window.

Memory Variables

Checking the **Memory variables** check box creates memory variables for all the fields. The DEFAULT clause automatically initializes the memory variables to their respective field types.

For information on using this feature, see the FoxPro *Developer's Guide*.

Maximum Field Width

The Maximum Field Width text box specifies the maximum width of a field. This value is equal to the width of the screen (as defined in the Screen Layout dialog). If the screen is defined as a window, the maximum width is equal to the defined width - 2 (for the window border). By default, the Design window is 80 character wide, and the maximum field width is set to 80.

If you are creating a screen in Column Layout and the maximum width is set at 80, the fields will appear stacked as if you are using Form Layout. This is because FoxPro is allowing 80 characters for each field. There is no room to place two or more fields on the same line. You may set the field width to any size that is less than the defined width of the window. If there is more data in the field than the set width, the data is truncated in the generated screen.

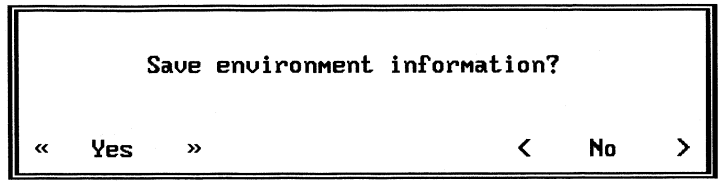
Choose **OK** in the Quick Screen dialog and the fields appear in the Design window. All the fields created with **Quick Screen...** are GET fields with no format or associated clauses defined. If you wish to use any of these options, you will need to specify them yourself.

Once the fields are displayed in the Design window, you can select them with the mouse or with the keyboard as previously described. You can size them and place them anywhere in the Design window. You can then add text and graphics and other controls to enhance your layout.

Saving the Screen

Save the screen just as you save a report, text or program file. Choose **Save** from the **File** menu popup and name the screen. The .SCX extension is automatically added to the file name.

If you have not previously saved environment information using the options in the Screen Layout dialog (as described earlier), an alert appears asking if you want to save the environment information.



Choosing **Yes** saves the environment information in fields of the .SCX database on disk. Choosing **No** saves the screen with no environment information.

When you save a screen, all information about the screen is stored in associated fields in the .SCX database. Options in the Open File dialog allow you to open the screen with or without the saved environment information.

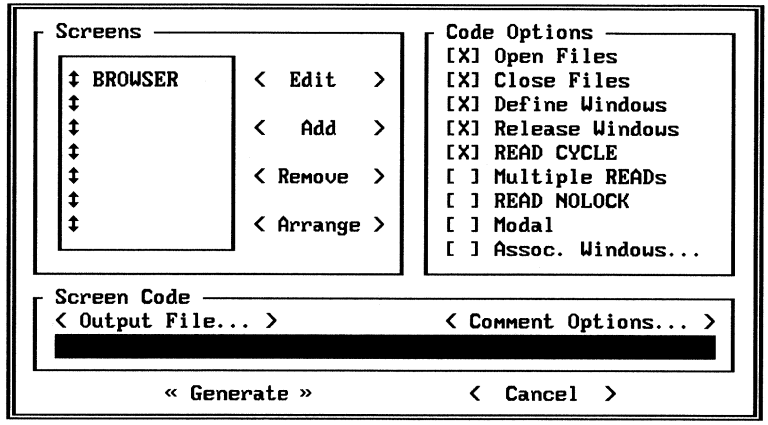
Code Generation

When you have completed designing your screens and saved all the screen information to the .SCX database, you are ready to generate code.

Generate...

Generate programs for screens

When a Screen Design window is active, the **Generate...** option on the **Program** menu popup is enabled. Choosing **Generate...** brings forward the Generate Screen dialog.



Generate Screen Dialog

This dialog contains many options that allow you to specify the screen panels that will be generated together into one program file. You can also specify certain code and output options in this dialog.

Screen Sets

In the Screens section of this dialog you can specify the screen sets you want generated into one program file. A screen set may consist of one screen panel or it may consist of many screen panels. Any screen panels that are currently open are displayed in this scrollable list.

If there are no screen panels open or displayed, you can select the screen panels for generation by choosing the **Add...** push button. The Open File dialog appears.

Locate the desired screen panel with the **Drive** and **Directory** popups. When the screen panel is displayed in the scrollable list, select the desired screen panel and choose the **Add** push button. You are returned to the Generate dialog where the specified screen panel appears in the list.

You can remove a screen panel from the list by selecting the screen panel and choosing the **Remove** push button.

Screen Order in a Screen Set

The order in which the screen panels appear in the list in the Generate dialog is the order in which they will be accessed upon execution of the generated program. The cursor will be positioned in the first field of the first screen in the screen set.

Mouse users can point and click to move between screens. Keyboard users can cycle from screen to screen by pressing Ctrl+F1. When the generated program is executed, the cursor will move from screen to screen in the order they are specified in the screen set.

Screen Set Order and READ Level Clauses

This section pertains only to screen sets generated with a single READ statement. It does not pertain to screen sets generated with multiple READs.

When code is generated, the order of the screen panels in a screen set can affect the generation of code snippets for READ level clauses.

The screen generator first looks for expressions and/or procedures corresponding to READ clauses in the first screen in the screen set. If no expressions or procedures are found, it continues looking in the second screen, then the third, and so on.

If FoxPro finds an expression for any READ level clause while scanning through the screen panels in a screen set, *that* expression will be placed in the READ. The search through other screens in the screen set is halted.

If a procedure is found first, then all other screens are searched and all procedures will be combined into one procedure. The call to *that* procedure will be placed in the READ.

READ Level Expressions

If you have defined expressions or procedures for the same clause in multiple screens in a screen set, the first expression that is located for the clause is used. Successive expressions and procedures for the same clause are ignored.

Example 1

A screen set with three screen panels is created. All of the screen panels in the screen set have expressions assigned to their respective VALID clauses.

The screen generator will locate the expression for the VALID clause for the first screen in the screen set. All expressions for all successive VALID clauses will be ignored. If procedures are defined for successive screens, they will be ignored as well.

READ Level Procedures

If a procedure is defined for READ level clauses, the screen generator locates all the procedures for a specific clause and concatenates the code snippets in the order the screens appear in the screen set. Any expressions defined for the clause in successive screens are ignored.

Example 2

A screen set has a procedure assigned to the VALID clause in the first and third screens in the screen set. The second screen in the screen set has an expression assigned to the VALID clause.

Upon generation, the procedure in the first screen panel will be located, the expression in the second screen panel will be ignored, and the procedure for the clause in the third screen panel will be concatenated with the procedure for the first screen panel.

Changing the Order of Screen Panels

When a screen panel is displayed in the list, a double-headed arrow appears to the left of the screen panel name. You can change the order in which screen panels are displayed and the order in which they will be accessed upon generation.

With the keyboard:

1. Press Tab until the first screen panel in the list is highlighted.
2. Press the Down Arrow key until the screen panel you wish to move is highlighted.
3. Press Ctrl+PgUp to move the screen panel up in the list. Press Ctrl+PgDn to move the screen panel down in the list.

The screen panel is now in a new location in the list and will be accessed in this order after generation.

If your keyboard supports the use of Ctrl+Arrow key combinations, you can press Ctrl+Up Arrow to move a screen panel up in the list and Ctrl+Down Arrow to move a screen panel down in the list.

To change the order with the mouse:

1. Click on the arrow and drag the screen panel to the desired location.
2. Release the mouse button.

The screen panel is now in a new location in the list and will be accessed in this order after generation.

Editing Screen Panels

To open a Design window for screen panels that are added to the screen set, select the desired screen panel and choose the **Edit** text button. You can make modifications to the screen panels and save your changes prior to generation.

Arranging Windows

When you create the screens, you specify row and column coordinates for any defined window. These coordinates are stored to corresponding fields in the .SCX database. The **Arrange...** push button in the Generate dialog allows you to reposition the windows for the specified screens without changing the coordinates stored in the .SCX database.

When you choose the **Arrange** push button, the Generate dialog is "hidden", an **Arrange** menu popup appears on the menu bar and window definitions for all specified screen panels appear on the monitor in their defined locations. The objects associated with the windows are not present.

The windows appear in the stacking order specified in the scrollable list in the Generate dialog. The first screen panel in the scrollable list is the topmost window definition on the monitor.

To arrange windows with the keyboard:

1. Choose **Move** from the **Arrange** menu popup. The frontmost window will blink to show that is selected to be moved.
2. Press the arrow keys until the window is in the desired location.
3. Press Enter to confirm the action.

To select another window, choose **Cycle** from the **Arrange** menu popup until the desired window is frontmost. Repeat the steps described above to place the window in the desired location.

To arrange windows with the mouse:

1. Select the window you wish to move.
2. Click and drag the window to the desired location.
3. Release the mouse button.

Repeat the process to move any other windows.

When the windows are in the desired location(s), choose **Save** from the **Arrange** menu popup. This will store the locations *to memory only*. It will not affect the window coordinates as they are stored in the .SCX database.

Upon generation, the windows will be defined in the locations specified when you arranged them with this option.

The **Cancel** option on the **Arrange** menu popup cancels the operation and returns you to the Generate dialog.

Code Options

This section of the Generate dialog allows you to specify whether or not specific code segments will automatically be generated.

Open Files

When **Open Files** is checked, code is generated to open the databases and indexes, and to set up the relations that were saved with the screen definition. This information is stored in corresponding fields and records of the .SCX database. Saving the environment information for a screen is described in the Screen Layout section of this chapter.

Unchecking this option will suppress generation of this code. Information about the environment can be defined in the Setup code with the **Setup...** option in the Screen Layout dialog. This option is described in the Screen Layout section of this chapter. Code defined with the **Setup...** option is *always* generated.

Close Files

By default, code is generated to close all files upon completion of the generated program. Unchecking **Close Files** will suppress the generation of this code.

Code to close files can be defined in the Cleanup code with the **Cleanup & Procs...** option in the Screen Layout dialog. This option is described in the Screen Layout section of this chapter. Code defined with the **Cleanup & Procs...** option is *always* generated.

Define Windows

By default, windows are automatically defined in the generated program using the information specified in the Screen Layout dialog and stored in corresponding fields of the .SCX database.

Unchecking this option suppresses the generation of the DEFINE WINDOW statements. You may write code to define the windows with the Setup option in the Screen Layout dialog. This option is described in the Screen Layout section of this chapter. Code defined with the **Setup...** option is *always* generated.

Release Windows

By default, RELEASE WINDOW statements are generated. Unchecking this option will suppress the generation of these statements.

Code to release windows can be defined in the Cleanup code with the **Cleanup & Procs...** option in the Screen Layout dialog. This option is described in the Screen Layout section of this chapter. Code defined with the **Cleanup & Procs...** option is *always* generated.

READ CYCLE

By default, READ CYCLE is generated in the program. READ CYCLE allows users to access several screens without exiting the READ.

Deselecting this option will generate a READ statement instead of READ CYCLE. For information on READ and READ CYCLE, see the appropriate section of the FoxPro *Language Reference.*

Multiple READs

By default, one READ CYCLE statement is generated at the end of the code that defines all screen panels.

Checking **Multiple READs** will generate a READ statement between the format statements for each screen panel. Each READ statement can have its own associated READ level clauses and procedures as defined with each screen in the Screen Layout dialog.

Modal Windows

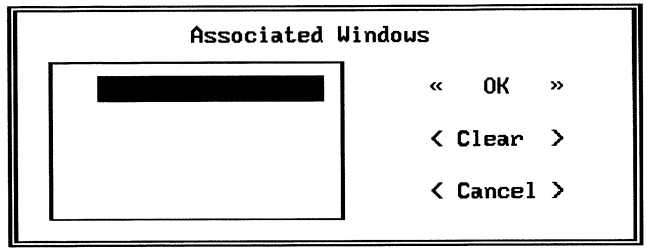
When you are involved in a READ, you can interact with other non-read windows without terminating the READ. The **Modal** and **Associated Windows** options, allow you to limit the non-read windows that can be activated during a READ.

When a window is defined as modal, the window assumes the behavior of a FoxPro dialog. This means that windows outside of the screen set cannot be brought forward on top of the screen set window and the current menu system is temporarily dimmed.

When the **Modal** check box is checked, the MODAL clause is added to the READ command in the generated program.

Associated Windows

You can include a list of windows that can be accessed along with the windows in the screen set if an Associated Window list is defined in the Associated Windows dialog.



Associated Windows Dialog

When you define an Associated Windows list, a WITH clause is added to the READ command in the generated program. The syntax for the WITH clause is:

```
READ WITH <window title list>
```

If you do not specify the MODAL clause or an associated window list, all windows can be accessed.

The WITH clause automatically makes the screen set modal. Only those windows defined in the screen set and specified in the Associated Window list can be activated.

To define a screen as Modal or assign an Associated Window list:

1. Choose the **Generate** option on the **Program** menu popup when the screen is frontmost or choose the **Edit** push button when building a project. The Generate Screen dialog appears.
2. Choose the **Modal** or **Associated Windows** check box. Modal defines the screen as modal (as described above).

When you choose the **Associated Windows** check box, the Associated window dialog appears.

This dialog allows you to specify the windows that can be activated with the screen set. Defining an Associated Window list automatically makes the screen set modal.

This is a restrictive list. Only those windows specified in the list can be activated. If other windows are present when the screen is executed, they will appear on the monitor but cannot be activated or accessed.

3. Specify the windows(s) you want to include to with the screen in the Associated Window list. These windows can be activated with those defined in the Screen Set. It is not necessary to include the windows defined in the Screen Set in the Associated Window list.

   Any Browse windows or Desk Accessories you would like to access with your screens should be included in the Associated Window list.

Windows specified in the Associated Window list can be referenced by their titles. If a window title contain characters that are not alphabetic, numeric or underscores, it must be referenced with the part of the title up to the first character that is not alphabetic, numeric or an underscore. For example, if the window title is Client List, you can reference it in the Associated Window list with Client.

You can reference window titles that contain non-alpha-numeric-underscore characters by placing the title within quotes in the Associated Window list. For example, if the window title is Client List, you can reference it in the Associated Window list as "Client List".

Rule 1 — To access a memo window while in a modal READ, include the database alias in the associated window list.

Rule 2 — To access a Browse window while in a modal READ, include the Browse window title (by default, the database alias) in the Associated Window list.

For examples of using these options, see the Coordinating Screens with Browse section of the Screens chapter in the FoxPro *Developer's Guide*.

READ NOLOCK

When **READ NOLOCK** is checked, a NOLOCK clause is generated with the READ and all GET fields are made read-only and all objects are disabled. **READ NOLOCK** is unchecked by default. For more information about READ NOLOCK, see the READ section in the FoxPro *Language Reference.*

For information on defining code for READ level clauses, see the Screen Layout section of this chapter. For information on READ level clauses, see the FoxPro *Language Reference* and the FoxPro *Developer's Guide*.

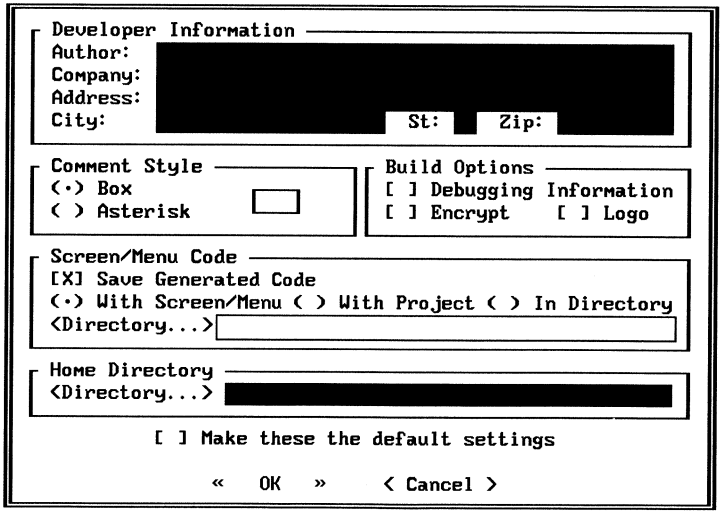
Output Options

This section of the Generate dialog allows you to specify the name of the output file. By default, the name of the screen panel at the top of the list (but with a .PRG extension) is displayed in this text box. You may enter any name you like.

Alternately, you can choose the **Output File...** push button to bring forward a dialog so you can select a path and file name for the output file.

Comment Options

Choose the **Comment Options...** push button to bring forward the Comment Options dialog in which you may define Developer Information and Comment Style. You can also specify the Home Directory, and whether or not to make the settings in this dialog the default settings for all screens. All other options in this dialog do not apply to screens and are therefore disabled.



Comment Options Dialog

Developer Information

The Developer Information section in the Screen Code Options dialog allows you to enter personal information such as Author, Address, Company, etc. This information is then included in the header of the generated program.

Comment Style

This section of the Screen Code Options dialog allows you to specify whether your generated code will be commented with boxes or asterisks.

The **Box** radio button is selected by default. Generated code will be displayed and printed with the specified option. In order to print your generated code with the **Box** option, your printer must support these characters.

Home Directory for Screens

The path specified in the Home Directory section of the Screen Code Options dialog is used when generating the USE commands in programs generated from screens. The path in the USE command is relative to the path specified in the Home Directory text box.

Example 1

- The database file(s) used for screen fields are located in C:\FOXPRO25\SCREENS\DBFS.
- C:\FOXPRO25\SCREENS\DBFS is specified in the Home Directory text box.

Since the database file(s) are located in the specified Home Directory, the generated USE command has no path.

Example 2

- The database file(s) used for screen fields are located in C:\FOXPRO25\SCREENS\DBFS.
- C:\FOXPRO25\SCREENS\ is specified in the Home Directory text box.

Since the database file(s) are located along the path specified in the Home Directory text box, the generated USE command has a partial path of DBFS\<filename>.

Example 3

- The database file(s) used for screen fields are located in C:\FOXPRO25\SCREENS\DBFS.
- C:\APPS\ is specified in the Home Directory text box.

Since the database file(s) have no relation to the path specified in the Home Directory text box, the entire path of \FOXPRO25\SCREENS\DBFS\<filename> is generated for the USE commands.

When porting a screen to a different directory or a different machine:

- Create a directory structure relative to the Home Directory specified.
- Place the files in the corresponding directories.

Your .SPR program will run unchanged in the new location.

Default Settings

At the bottom of the Screen Code Options dialog is the **Make these the default settings** check box. When this check box is checked, all settings in this dialog are saved in the FOXUSER file and appear in this dialog the next time is is displayed.

If you change the information in this dialog, you must select the **Make these the default settings** check box before exiting the dialog if you want these new settings saved in the FOXUSER file. If you do not select this option, the corresponding information in the FOXUSER file will remain unchanged.

When you have entered the desired information, choose **OK** to return to the Generate dialog.

Generating the Code

When you have selected and ordered the desired screens, chosen the desired code options, entered the desired output filename and chosen the desired Comment Options, choose the **Generate** push button. The code for the screen(s) is automatically generated with the given output <filename>.

Generated code can be treated like any FoxPro program. You may run the program with the Trace and/or Debug windows for debugging the code.

13 Menu Builder

You can use the FoxPro Menu Builder to design custom menu systems. To design a menu system, you must first use the Menu Design window to define menu pads, menu popups and submenus. You will then use the code generator to generate the program code needed to create and activate the menu system. Finally, you will execute the program.

When you design a menu system, FoxPro creates a menu file with an .MNX extension. This file is actually a FoxPro database that stores all the information about the menu system.

As you define menus, you can assign commands or create procedures for the menu options. When you create a procedure, you can write *code snippets* to specify the actions that will take place when the menu option is chosen. A code snippet is a procedure or expression associated with a specific menu pad, menu popup or menu option. You can also define code snippets that perform actions on the entire menu system.

Other code may also be associated with a menu system. You may define code snippets that include setup and cleanup 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. *Cleanup code* is executed after the menu definition code and may contain code snippets for procedures. Code snippets are stored in the .MNX database file.

After designing the menu system, you generate code for it using the menu generator. The menu generator uses the data stored in the .MNX database to create a program file.

The generated program code includes the menu definitions and code snippets. Generated menu programs have an .MPR extension. This program file can be executed to activate a custom menu system you have designed.

Starting the Menu Builder

You can use the FoxPro Menu Builder to define a menu system. The menu system can contain a horizontal menu bar with menu popups under each pad on the menu bar.

The Menu Builder gives you full control over what appears on the menu bar and the menu popups. You can delete items from or place items onto the menu bar and menu popups. A command, pad name/bar number, submenu or procedure may be assigned to any menu pad or menu option that you create. If you assign a procedure to a menu pad or menu option, you can create a code snippet to define the actions that take place when the menu pad or option is chosen.

Creating a New Menu System

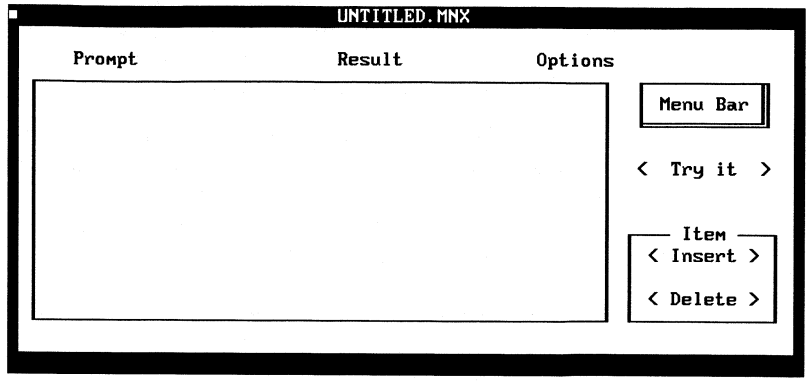
To create a new menu system:

1. Choose **New...** from the **File** menu popup.
2. Choose the **Menu** radio button.
3. Choose **OK**. An untitled Menu Design window appears.

If you prefer, you can create a new menu system by typing the following in the Command window:

```
CREATE MENU <filename>
```

A Menu Design window appears with UNTITLED.MNX as its title (unless you specified a <filename>. The first time you save the file, you will be prompted to give the file a new name.



Menu Design Window

Opening an Existing Menu File

To open an existing menu file, choose **Open...** from the **File** menu popup. The Open File dialog appears.

Make sure **Menu** is displayed on the **Type** popup control. Choose the desired menu file from the scrollable list, then choose **Open**. With a mouse, you can double-click on the desired menu file to open it.

If you prefer, in the Command window you can type:

```
MODIFY MENU <filename>
```

Opening Multiple Menu Files

You may open many menu files at the same time. The number of files you may open is limited only by available memory and file handles.

Menu Design Window

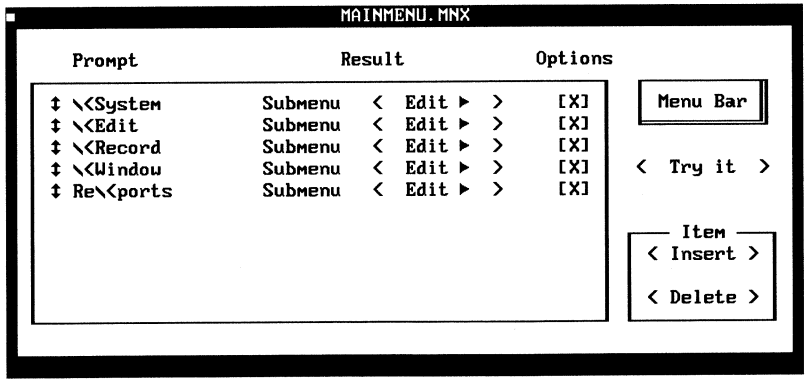
When a Menu Design window is frontmost, a menu pad named **Menu** is added to the system menu bar. Options on this menu allow you to define setup and cleanup code for the menu system. You can also specify global defaults that apply to the entire menu system. The **Menu** menu popup is described later in this chapter.

In the Menu Design window, you specify the *prompts* for the menu pads and popups. A prompt is the text for a particular menu pad that appears on the menu bar. You also define whether to issue a command, create a code snippet, specify a pad name/bar number or create a submenu for each prompt.

> Unless otherwise noted, all pictures in this chapter are from the MAINMENU.MNX menu. This menu and all associated files are locate in the FOXPRO25\SAMPLE\MENUS directory.

Defining Prompts for Menu Pads

At the top level of the Menu Design window, you define the pads for the menu bar. When the menu system is generated, the pads are located across the top line of the screen.



Menu Design Window with Defined Pads for MAINMENU.MNX

To define a pad that will appear on the menu bar, position the cursor in the first empty prompt field in the Menu Design window and type in the text for the prompt.

Prompts for menu pads and options must begin with an alphabetic character (except for special characters used for hot keys). If you enter an invalid prompt, a unique name for the pad or option is created. This unique name appears in the generated program and ensures that names are not duplicated. The unique name does not change the defined prompt in the generated menu system.

Defining Hot Keys for Menu Pads

Special characters allow you to define hot keys for menu pads. Upon execution of the menu system, pressing the Alt key will select the leftmost menu pad on the menu bar. When a menu pad is selected, you can press the hot key to choose the corresponding menu pad and display the associated menu popup.

When defining the prompts for the menu pads, you can define hot keys associated with the prompts by placing \< before the letter in the prompt that will act as the hot key.



If a menu prompt contains more than one occurrence of any character, only the first occurrence of the that character can be designated as a hot key.

For example, you are defining a menu pad or submenu option with the prompt "Save" and you would like the letter "S" to be the hot key. When entering the prompt in the Prompt section of the Menu Design window, type:

```
\<Save
```

Upon generation, the "S" will be the hot key for the "Save" menu pad or submenu option.

If you want to make the letter "v" in "Save" the hot key, you would type:

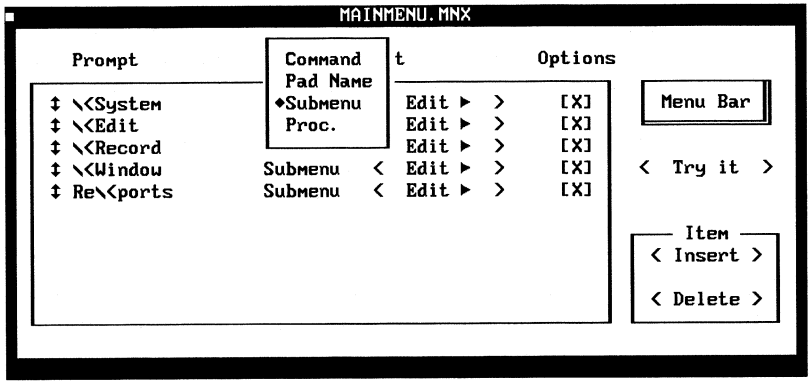
```
Sa\<ve
```

Upon generation, the "v" will be the hot key for the "Save" menu pad or submenu option.

Assigning Results to Menu Pads

After the prompt text is entered, you must choose a result. The result can be a submenu, command, pad name or procedure.

At the Menu Bar level, **Submenu** is displayed on the popup by default and a **Create** push button appears to the right of the popup at the menu pad level. If a submenu has been defined, the **Create** push button changes to **Edit**. In the generated menu system, a submenu is a popup that is displayed when you choose the menu pad.



Menu Design Window with Result Popup for Menu Pads

To choose a result with the keyboard, position the cursor on the **Result** popup and press the Spacebar. Select the desired option from the popup and press Enter. The new selection is displayed and a text box or a **Create** push button is displayed to the right of the selection (depending on the popup selection).

To choose a result with a mouse, click on the **Result** popup and select an option. The new selection is displayed and a text box or a **Create** push button is displayed to the right of the selection (depending on the popup selection). If a submenu has been defined for a prompt, an **Edit** push button appears. The possible results are described in the next section.

Submenu

When defining menu pads, **Submenu** is displayed on the **Result** popup by default. A **Create** or **Edit** push button appears to the right of the popup depending on whether or not a submenu has been defined. You can choose **Create** or **Edit** to display a new design area in the Menu Design window so you can define or modify the submenu.

Upon execution, the submenu you've defined is the popup that is displayed when you choose the menu pad. Defining prompts and results for submenus is described later in this chapter.

Command

When you choose **Command** from the **Result** popup, a text box appears so you can type the desire command.

This command may be any valid FoxPro command, including a call to a program that exists on your path or a program defined with the **Cleanup...** option in the General Options dialog. In the generated menu system, this command is executed when the associated menu pad or submenu option is chosen.

When defining a command, the following syntax must be used:

```
DO <procname> IN <menuname>
```

The <menuname> is the name of the menu file.

Pad Name

When you choose **Pad Name** from the **Result** popup, a text box appears so you can enter a name for the menu pad. You can enter a pad name of your own, or a system name associated with a pad on the FoxPro system menu bar. For information about pad names on the FoxPro system menu bar, see the Menus — System Menu Names section in the FoxPro *Language Reference.*

Procedure

When you choose **Proc.** from the **Result** popup, a **Create** push button appears to the right of the popup. If a procedure has previously been defined, an **Edit** push button appears. Choosing the **Create** or **Edit** push button opens a program editing window.

In the program editing window, you may define a code snippet associated with the menu pad or option.



Do not use the PROCEDURE command when writing code snippets for menu pads and options.

Upon code generation, a unique name is created for each procedure. FoxPro inserts this unique name in the code for the associated prompt. A procedure file containing the defined code snippet is assigned this unique name. Procedures defined with this option appear at the end of the generated program.

When you save the menu system, the state of the editing windows is saved as well. The next time you open the Menu Design window, the editing windows will open in the same position and state as when you closed the Menu Design window. If the editing windows were open and/or docked when the Menu Design window was closed, they will appear in that state.

Defining Prompts for Submenus

When you choose the **Submenu** result for a menu pad and choose **Create** or **Edit**, a new design area is displayed in the Menu Design window. At execution time, the submenu you define is the popup that is displayed when the menu pad is chosen. Enter the prompts for the submenu just as you entered the prompts for the menu pads (as described earlier).

Special characters allow you to define hot keys for menu popups. Upon execution of the menu system, pressing the hot key when the menu popup is displayed will execute the result assigned to the menu popup option.

Defining Hot Keys

When defining the prompts of the menu pads, you can define hot keys associated with the prompts by placing \< before the letter in the prompt that will be the hot key.



If a menu prompt contains more than one occurrence of any character, only the first occurrence of the that character can be designated as a hot key.

For example, you are defining a submenu option with the prompt "Save" and you would like the "S" to be the hot key. When entering the prompt in the Prompt section of the Menu Design window, type:

```
\<Save
```

Upon generation, the "S" will be the hot key for the "Save" submenu option.

If you want to make the "v" in "Save" the hot key, you would type:

```
Sa\<ve
```

Upon generation, the "v" will be the hot key for the "Save" submenu option.

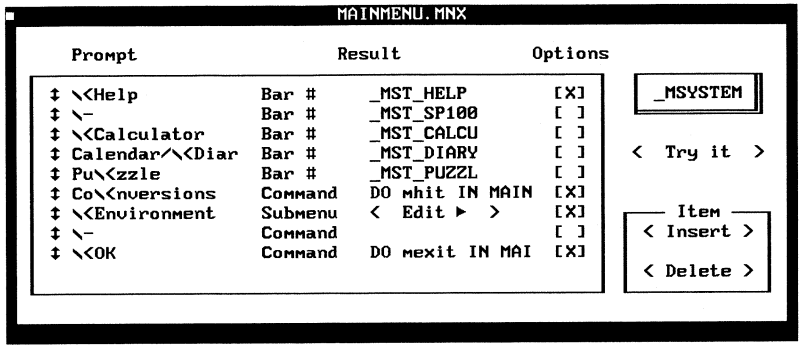
Defining Divider Lines

You can define divider lines to appear on a menu popup to separate options on the popup.

Enter a backslash and a hyphen (\-) on an empty prompt line between the submenu options you would like the divider line to separate. When you view the menu structure with the **Try It** push button, the defined divider lines are visible. The divider lines also appear in the generated menu system.

Assigning Results to Submenus

When you are defining the options to appear on a submenu, **Command** is displayed on the **Result** popup by default and a text box appears to the right of the **Result** popup.



Menu Design Window with Result Popup for Submenus

To choose a different result with the keyboard, position the cursor on the **Result** popup and press the Spacebar. Select the desired option from the popup and press Enter.

To choose a different result with a mouse, click on the **Result** popup and select an option.

The possible results that you can assign to prompts are described next.

Command

When you want an option on a submenu to execute a command, choose Command from the **Result** popup.

When you choose **Command** from the **Result** popup, a text box appears so you can enter any valid FoxPro command. An example is a call to a program that exists in your path or a program defined with the **Cleanup...** option in the General Options dialog. In the generated menu system, this command is executed when the menu option is chosen. When defining this command, the following syntax is used:

DO <procname> IN <menuname>

The <menuname> is the name of the menu file (.MPR or .MPX).

Submenu

When you want an option on a submenu to display another submenu, choose **Submenu** from the **Result** popup. Upon execution, the submenu you've defined is the popup that is displayed when the associated menu option is chosen.

When you choose **Submenu** from the **Result** popup, a **Create** push button appears to the right of the popup. If a submenu has been previously defined, an **Edit** push button appears to the right of the popup.

You can choose the **Create** or **Edit** push button to display a new design area in the Menu Design window so you can define or modify the submenu.

Bar Number

When you choose **Bar #** from the **Result** popup, a text box appears so you can enter a number for the submenu option. You must enter a bar number of your own, or a system name associated with the FoxPro system menu bar. For information on the FoxPro system menu names, see the Menus — System Menu Names section in the FoxPro *Language Reference.*

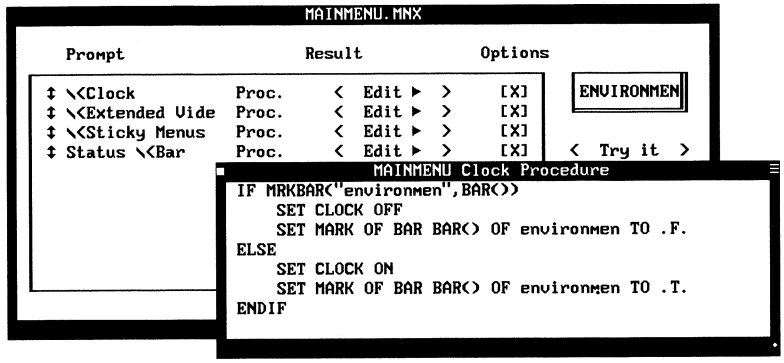
In most cases, you will use this option to enter a name associated with the FoxPro system menu bar.

In certain situations, you may want to enter your own bar number. If you define a bar number, you must issue the following command in the the Cleanup code for the menu system or in code of your own to define the behavior of the menu option:

```
ON SELECTION BAR <barnumber> OF <popupname> <command>
```

Procedure

When you want a procedure to be executed when a menu option is chosen, choose **Proc.** from the **Result** popup, and choose the **Create** push button appearing to the right of the popup. A program editing window appears so you can enter the procedure code snipped associated with the menu option. If a procedure has previously been defined, an **Edit** push button appears in place of **Create**. Choosing the **Edit** push button opens a program editing window.



Procedure Editing Window for Submenu Option



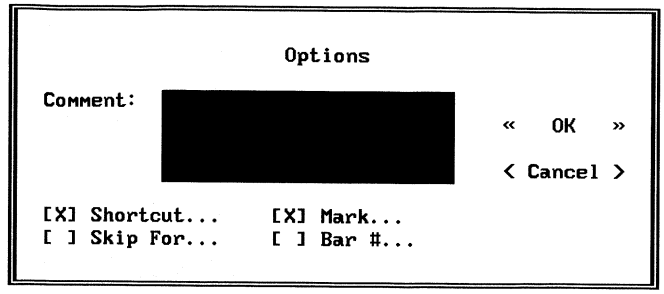
Do not use the PROCEDURE command when writing code snippets for menu pads and options.

Upon code generation, a unique name is created for each procedure. This unique name is inserted in the code for the associated prompt. A procedure file containing the defined code snippet is assigned this unique name. Procedures defined with this option appear at the end of the generated program.

When you save the menu system, the state of the editing windows is saved as well. The next time you open the Menu Design window, the editing windows will open in the same position and state as when the menu file was closed. If the editing windows were open and/or docked when the Menu Design window was closed, they will appear in that state.

Menu Options

When you define a prompt for a menu pad or submenu option, an **Options** check box appears to the right of the result. Choose this check box to bring forward the Prompt Options dialog.



Prompt Options Dialog

This dialog allows you to create a comment and specify Shortcut, Skip For and Mark for the selected menu pad or submenu option.

Comment

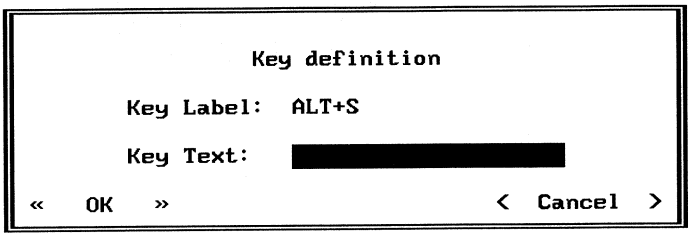
This text editing region in the Prompt Options dialog holds comments that are stored in the .MNX database. Comments are for your personal use only. They do not affect the generated code in any way.

Shortcut...

In addition to hot keys, you can specify keyboard shortcuts to choose menu pads and menu options.

Shortcuts for Menu Pads

A menu pad can be chosen by pressing a key or key combination shortcut. Choosing the **Shortcut...** check box brings forward a Shortcut dialog that accepts a **Key Label** definition.



Shortcut Dialog

This key label designates the key or key combination that can be used to choose the menu pad. Upon execution, when you press the shortcut key combination, the menu pad is chosen and the associated menu popup is displayed.



Make the keyboard shortcut key label a key combination with the hot key (defined with special characters as described earlier). For example, in the FoxPro system menu, the "F" on the **File** menu pad is the hot key, and Alt+F chooses the menu pad and displays the menu popup.

In addition, you can define **Key Text** for menu option shortcuts in the Shortcut dialog. When you define the **Key Label**, that text is also displayed in the **Key Text** text box. You can change this text to anything you like.

The FoxPro menu code generator does not use Key Text information when defining menu pads. If you define Key Text for menu pads, the text does not appear in the menu bar. If you write templates to generate code, the Key Text information is available.

Shortcuts for Submenu Options

You can define a key combination shortcut so that a menu option can be chosen without displaying the menu popup and choosing the option with the mouse or keyboard.

Choose the **Shortcut...** check box to bring forward the Shortcut dialog that accepts a **Key Label** definition. This key label designates the key or key combination used to choose the menu option automatically, without displaying the menu popup first. In the generated menu system, when you press the key combination defined with key label, the associated menu option is chosen and the assigned command, bar number or procedure is executed.

In addition, you can define **Key Text** for menu option shortcuts in the Shortcut dialog. When you define the **Key Label**, that text is also displayed in the **Key Text** text box. You can change this text to anything you like. The text defined in the **Key Text** text box appears on the menu popup to the right of the corresponding menu option.

Examples of keyboard shortcuts appear throughout the FoxPro menu system. FoxPro menu option shortcuts are typically combinations of the Ctrl key and another key.

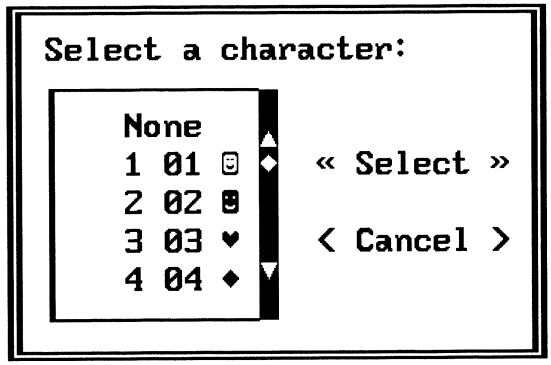
Skip For...

A menu pad or submenu option may be disabled (made unavailable for selection) based on a logical condition. To disable a pad or option, choose the **Skip For...** check box in the Prompt Options dialog to bring forward the Expression Builder dialog. Here, you create the logical expression that is evaluated to determine whether the pad is disabled or enabled.

If the expression evaluates to true (.T.), the pad is disabled and cannot be selected or chosen. If the expression evaluates to false (.F.), the pad is enabled. For information on Skip For, see the DEFINE BAR and DEFINE PAD sections in the FoxPro *Language Reference.*

Mark...

A check mark can be placed before a menu pad or menu option to indicate that a certain condition exists (a menu popup is available for a pad, an option controlled by the pad is on or off, and so forth). A small diamond (◆) is the default check mark for menu pads. "None" is the default check mark for menu options. You can specify a different check mark for a pad by choosing the **Mark...** check box in the Prompt Options dialog and choosing a mark character from the Select a Character dialog that appears.



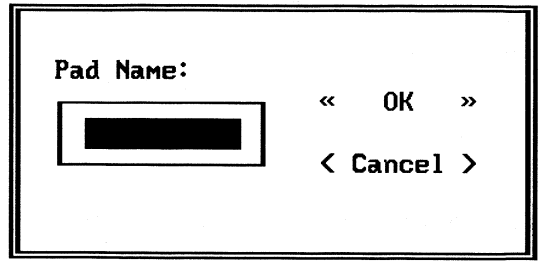
Select a Character Dialog

Procedures must be defined to set marks on or off in the generated menu system. This procedure can be defined in the Cleanup code for the menu system. Defining Cleanup code is described later in this chapter.

The **Mark...** option simply specifies the mark character that will be displayed in the generated menu system *if* a procedure is defined to display the mark. Examples of these procedures are in the Menus chapter of the FoxPro *Developer's Guide*.

Pad Name/Bar

When you define a menu pad and assign a result of Command, Submenu or Procedure, a **Pad Name...** check box appears in the Prompt Options dialog. Check this box to bring forward a dialog in which you assign a name for the menu pad.



Pad Name/Bar # Dialog

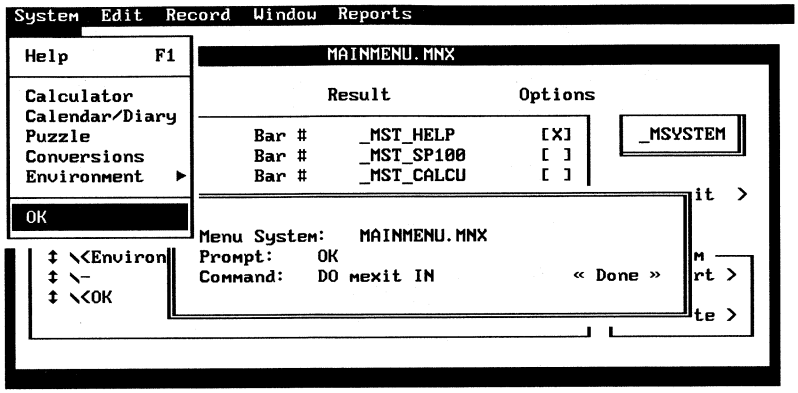
This name appears in the Menu Design window if you choose **Pad Name** on the **Result** popup.

When you define a submenu option and assign a result of Command, Submenu or procedure, a **Bar #...** check box appears in the Prompt Options dialog. Check this box to bring forward a dialog in which you assign a name for the menu option. This name appears in the Menu Design window if you choose **Bar #** on the **Result** popup.

Try It

You can check the results of your menu definition at any time by using the **Try It** push button. When you choose the **Try It** push button in the menu Design window, the menu system you've defined appears at the top of the screen and a Try It dialog appears that displays the file name of the menu system.

When you choose menu pads and submenu options, the prompt that you selected and the command that's assigned to the option are displayed in the dialog.



Try It Dialog

Insert/Delete Menu Pads and Options

You can insert and delete menu pads and submenu options in an existing menu structure with the **Insert** and **Delete** push buttons in the Menu Design window.

To insert a menu pad or submenu option:

1. Position the cursor in the prompt that you want to follow the new prompt.
2. Choose the **Insert** push button. A prompt with the text "New Item" appears in the Menu Design window.

Use the methods described earlier to assign results and/or options to new menu pads and submenu options.

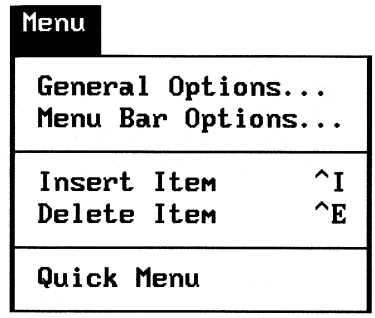
To delete a menu pad or submenu option:

1. Position the cursor in the prompt you wish to delete.
2. Choose the **Delete** push button.

The prompt is deleted. Any results associated with the prompt are deleted as well.

"Menu" Menu Pad

Options on the **Menu** menu popup allow you to define code and specify options for menu pads and menu popups.

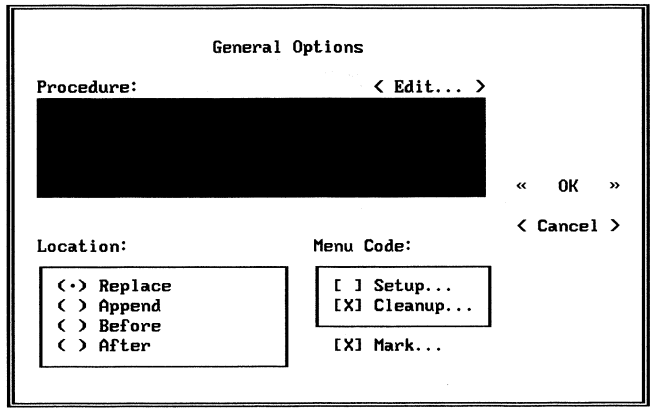


Menu Menu Popup

You can create setup and cleanup code snippets for the menu system. This menu popup also contains menu option equivalents for the **Insert** and **Delete** push buttons in the Menu Design window, and a **Quick Menu** option that will automatically display the FoxPro system menu structure in the Menu Design window.

General Options...

Choose **General Options...** to bring forward the General Options dialog.



General Options Dialog

In this dialog you can:

- Define a global procedure, setup code or cleanup code
- Specify a global mark character
- Specify the location of this menu system in relation to the current menu structure

Procedure

If you like, you can define a procedure for your entire menu system. When any menu pad in the menu system is chosen, this procedure is executed.

If you define a global procedure and you have also created a procedure for a specific menu pad, the procedure at the lowest level (the one assigned to a specific menu pad) will be executed. The procedure defined in the General Options dialog is executed *only* when no other procedure exists for the menu pad.

You can define the code snippet in the text editing region of the Global Options dialog. If the code snippet is larger than the display in this text editing region, a scroll bar appears on the right side of the text editing region.

You can use tabs to indent code within this text editing region. In all other FoxPro dialogs, pressing Tab moves you from one area of a dialog to the next. Because pressing Tab in the text editing region inserts a tab in the region, you must press Ctrl+Tab to exit the text editing region and move to the next area of the dialog. With a mouse, you may exit the text editing region by pointing and clicking on another area of the dialog.

If you prefer, you can choose the **Edit...** push button in the General Options dialog to launch a program editing window behind General Options dialog so you can create the code snippet there instead of in the dialog. When you choose **OK** in the General Options dialog, the procedure editing window is frontmost and you can begin coding.

Because windows cannot open on top of dialogs, program editing windows are launched behind the dialog. This also allows you to open multiple editing windows without having to choose the menu option and bring forward the dialog.

When you save the menu system, the state of the editing windows is saved as well. The next time you open the menu file, the editing windows will open in the same position and state as when the menu file was closed. If the editing windows are opened and/or docked, they will appear in that state.

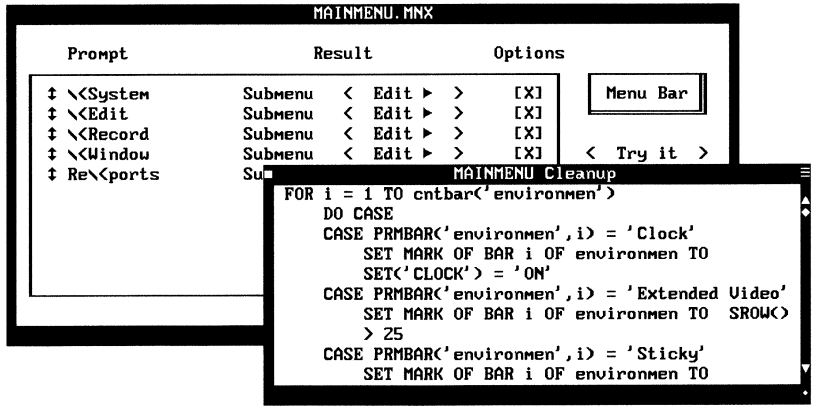
Setup...

The **Setup...** option in the General Options dialog allows you to define a code snippet with setup code for the menu system. Choosing the **Setup...** check box launches a program editing window behind the General Options dialog so you can define the code snippet. When you choose **OK** in the General Options dialog, the cursor is positioned in the program editing window and you may begin coding.

The setup code is generated at the beginning of the menu program. It may include code to create the environment, define memory variables, open any necessary files, PUSH and POP menu systems, etc. For more information on PUSH and POP, refer to the FoxPro *Language Reference.*

Cleanup...

The **Cleanup...** option in the General Options dialog allows you to define a code snippet with cleanup code for the menu system. Choosing the **Cleanup...** check box launches a program editing window behind the General Options dialog so that you can define the code snippet. When you choose **OK** in the General Options dialog, the cursor is positioned in the program editing window and you may begin coding.



Cleanup Code Program Editing Window

The cleanup code can be used to manipulate specific menu pads, popups and options.

You can also define procedures that are called in the program. Any procedures that are called with the **Command** option on the **Results** popup can be defined in this code snippet. If a procedure calls another procedure, the procedure must use the following syntax:

```
DO <procname> IN <menuname>
```

The <menuname> is the name of the menu file.



> When defining procedures with this option, be sure to use the PROCEDURE command at the beginning of the procedure and issue a RETURN at the end of the procedure.

Unique names are *not* generated for procedures defined with this option.

Mark...

The **Mark...** check box in the General Options dialog allows you to set a global mark character. This character is placed before each menu pad and indicates that a certain condition exists (a menu popup is available for the pad, an option controlled by the pad is on or off, and so forth).

If a different mark is selected in the Options dialog for a specific menu pad or submenu option, that mark is used instead of the global mark specified in the General Options dialog.

Procedures must be defined to set marks on or off in the generated menu system. This procedure can be defined in the Cleanup code for the menu system. Defining Cleanup code is described later in this chapter.

The **Mark...** option simply specifies the mark character that will be displayed in the generated menu system *if* a procedure is defined to display the mark. Examples of these procedures are in the Menus chapter of the FoxPro *Developer's Guide*.

Location

Four radio buttons in the Location area of the General Options dialog allow you to specify the position of this menu system in relation to the active menu system:

- **Replace** completely replaces the existing menu system with the new menu system. The **Replace** radio button is chosen by default.
- **Append** adds the new menu system to the right end of the active menu system (typically the FoxPro system menu bar).
- **Before** displays a popup containing the prompts of the active menu system. Choose an option on this popup to indicate the pad to display the new menu system *before*.
- **After** displays a popup containing the prompts of the active menu system. Choose an option on this popup to indicate the pad to display the new menu system *after*.

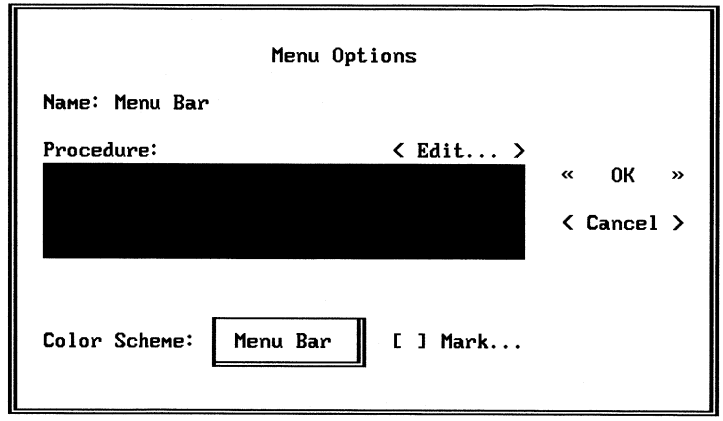
Menu Options...

This option on the **Menu** menu popup changes to reflect the name of the entire menu system or the prompt of a specific menu popup.

When defining menu pads, **Menu Bar Options** appears on the **Menu** menu popup. When you define submenus for the menu pads or other menu options, the name of the prompt for the submenu is displayed. The option displayed on the **Menu** menu popup is always the same as the prompt displayed on the popup control in the Menu Design window.

Because this menu option can change to reflect any name you have specified, this discussion refers to it as **Menu Options**.

Choose **Menu Options...** to bring forward the Menu Options dialog.



Menu Options Dialog

In this dialog, you can define a procedure for all menu popups in the menu system, specify a color scheme for the menu system or specific menu popups, and specify a mark for specific menu popups.

Whereas **General Options...** specifies code for the entire menu system or marks for the menu pads, **Menu Options...** allows you to specify code for a specific menu popup.

Name

The Name section of the Menu Options dialog contains the prompt with which the menu popup is associated. If the Menu Design window displays the prompts for the menu *pads*, "Menu Bar" is displayed in the Name section. The Name cannot be changed for menu options associated with menu *pads*.

When the Menu Design window displays definitions of submenus, the prompt with which the submenu is associated is displayed on the menu popup in the Design window and in the Name section of the Menu Options dialog.

You may change the Name for the submenu by entering a new name in the **Name** text box. Changing the name causes the new name to be displayed on the popup control in the Menu Design window and on the **Menu** menu popup. It does not, however, alter the name of the prompt with which the submenu is associated.

All code and options specified in the Menu Options dialog act on the specific menu popup associated with the Name displayed in this dialog.

Procedure

If you like, you can define a procedure for your entire menu system or a particular popup. When any menu pad or submenu option in the menu system is chosen, this procedure is executed.

If you define a code snippet when Menu Bar is displayed in the **Name** section of the Menu Options dialog, the procedure will be executed when any option on *any* menu popup is chosen.

When you define code for a specific menu popup, the procedure will be executed when any option on the *specified* popup is chosen.

If you have created a procedure for a specific menu pad or submenu option, the procedure at the lowest level will be executed. The procedure defined in the Menu Options dialog is executed only when no other procedure exists for a specific menu pad or submenu option.

You can define the code snippet in the text editing region of this dialog. If the code snippet is larger than the display in this text editing region, a scroll bar appears on the right side of the text editing region.

The text editing region of this dialog allows you to use tabs to indent code. In all other FoxPro dialogs, pressing Tab moves you from one area of a dialog to the next. Since pressing Tab in the text editing region inserts a tab in the region, you must press Ctrl+Tab to exit the text editing region and move to the next area of the dialog. With a mouse, you may exit the text editing region by pointing and clicking on another area of the dialog.

If you prefer, you can choose the **Edit** push button in the Menu Options dialog to launch a program editing window behind the Menu Options dialog so you can create the code snippet there instead of in the dialog. When you choose **OK** in the Menu Options dialog, the procedure editing window is frontmost and you can begin coding.

Color Scheme

Use the **Color Scheme** popup in the Menu Options dialog to select a color scheme for the entire menu system or for a specific menu popup. The color scheme will be assigned to the menu popup associated with the prompt displayed in the Name section of this dialog. If Menu Bar is displayed in the Name section of the dialog, the color scheme is specified for the entire menu system.

Mark...

Use the **Mark...** option in the menu Options dialog to select a mark character for the entire menu system or for a specific menu popup. The mark is assigned to the menu popup associated with prompt displayed in the Name section of this dialog. If Menu Bar is displayed in the Name section of the dialog, the mark is specified for submenu options throughout the entire menu system.

Procedures must be defined to set marks on or off in the generated menu system. This procedure can be defined in the Cleanup code for the menu system. Defining Cleanup code is described later in this chapter.

The **Mark...** option simply specifies the mark character that will be displayed in the generated menu system *if* a procedure is defined to display the mark. Examples of these procedures are in the Menus chapter of the FoxPro *Developer's Guide*.

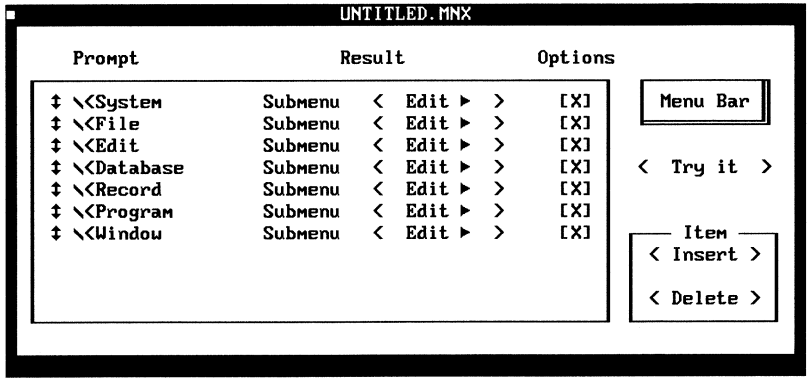
Insert/Delete Item

These are menu equivalents of the **Insert/Delete** push buttons in the Menu Design window. For information on inserting and deleting menu pads and submenu options, see the section titled Insert/Delete Menu Pads and Options earlier in this chapter.

Quick Menu

The **Quick Menu...** option can be chosen only when the menu structure is empty. Once a prompt is placed in a menu structure, this option is disabled. If all items are deleted, however, this item is enabled and can be chosen.

Choosing the **Quick Menu...** option creates a complete menu structure based on the default FoxPro menu system. Each of the menu prompts (**System**, **File**, **Edit**, **Database**, **Record**, **Program** and **Window**) will appear in the dialog. Their associated submenus are defined as well.



Menu Design Window with Quick Menu

If your custom menu system contains many options from the FoxPro menu system, use **Quick Menu...** to create the default FoxPro menu system and delete the items you don't want in your custom menu system.

Once they are placed here, you can insert or delete prompts, change their text, change their order or edit the contents of the submenus.

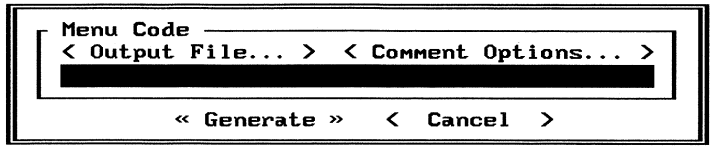
Saving a Menu File

To save the menu, choose **Save** from the **File** menu popup, click the close box in the Menu Design window or press Ctrl+W. The first time you save the menu file, you will be prompted to name the file.

When you save the menu file, all prompts, commands, code snippets, etc., are stored in corresponding fields in the .MNX database.

Generating Code

When you are ready to generate menu code, choose **Generate** from the **Program** menu popup to display the Generate dialog.



Generate Menu Dialog

The Generate Menu dialog contains options that allow you to name the output file that will be generated and choose comment options.

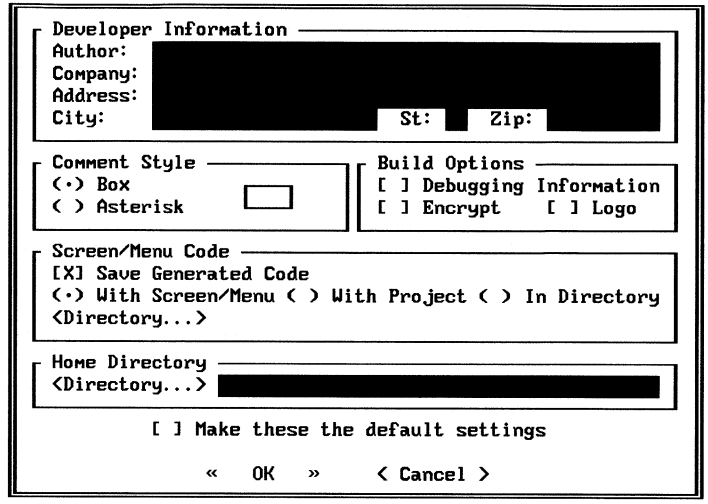
Output Options

This section of the Generate dialog allows you to specify the name of the output file. By default, the name of the menu file (but with a .MPR extension) is displayed in this text box. You may enter any name you like.

Alternately, you can choose the **Output File...** push button to bring forward a dialog in which you may select a path and file name for the output file. You can choose a file name from the scrollable list or enter a file name in the text box in this dialog. Choose **Save** to return to the Generate dialog.

Comment Options

Choose the **Comment Options...** push button to bring forward a the Menu Code Options dialog in which you can define Developer Information and Comment Style. You can also specify the Home Directory, and whether or not to make the settings in this dialog the default settings for all screens. All other options in this dialog do not apply to screens and are disabled.



Menu Code Options Dialog

Developer Information

The Developer Info section in the Menu Code options dialog allows you to enter personal information such as Name, Address, Company, etc. This information is then included in the header of the generated program.

Comment Style

This section of the Menu Code Options dialog allows you to specify whether your generated code will be commented with boxes or asterisks.

The **Box** radio button is selected by default. Generated code will be displayed and printed with the specified option. In order to print your generated code with the **Box** option, your printer must support these characters.

Home Directory

The path specified in the Home Directory section of the Menu Options dialog is used when generating the IN clause of the DO <filename> IN <menuname> commands in programs generated from menus. The path in the IN clause is relative to the path specified in the Home Directory text box.

Example 1:

- The menu file is located in C:\FOXPRO25\MENUS.
- C:\FOXPRO25\MENUS is specified in the Home Directory text box.

Because the menu file is located in the specified Home Directory, the generated IN clause will have no path.

Example 2:

- The menu file is located in C:\FOXPRO25\MENUS.
- C:\FOXPRO25\ is specified in the Home Directory text box.

Since the menu file is located along the path specified in the Home Directory text box, the generated IN clause will have a partial path of MENUS\<filename>.

Example 3:

- The menu file is located in C:\FOXPRO25\MENUS.
- C:\APPS\ is specified in the Home Directory text box.

Since the database file(s) have no relation to the path specified in the Home Directory text box, the entire path of \FOXPRO25\MENUS\<filename> is generated for the IN clause.

When porting a menu to a different directory or a different machine:

- Create a directory structure relative to the Home Directory specified.
- Place the files in the corresponding directories.

Your .MPR program will run unchanged in the new location.

Default Settings

At the bottom of the Menu Code Options dialog is the **Make these the default settings** check box. When this check box is selected, all settings in this dialog are saved in the FOXUSER file and appear in this dialog the next time it is displayed.

When you have entered the desired information, choose **OK** to return to the Generate dialog.

Generating the Code

When you have selected entered the desired output filename and selected the desired Comment Options, choose the **Generate** push button. The code for the menu system is automatically generated with the given output <filename>.

Generated code can be treated like any FoxPro program. Use FoxPro editing features to modify the program. You may run the program with the Trace and/or Debug windows for debugging the code.

14 Relational Query By Example (RQBE)

RQBE makes it easy to pose a *query* to FoxPro to obtain information from databases. Through the RQBE window, you can specify the information you want without telling FoxPro how to retrieve the information. FoxPro determines the best way to retrieve the information. Once you finish choosing options in the RQBE window, you have actually created a SQL SELECT command that FoxPro can execute.

In the FoxPro documentation, the terms *table* and *database* are used interchangeably. The *rows* in a table are the same as *records* in a database and the *columns* in a table are the same as *fields* in a database.

For a tutorial approach to RQBE, refer to the FoxPro *Getting Started* manual.

Creating a Query with RQBE

FoxPro makes it easy for you to create a query (SELECT command). All you need to do is specify settings in the RQBE window and FoxPro takes care of the rest. The steps involved in creating and executing a query are listed below, with the required steps listed in **bold**. Each step is described in detail in its own section.

To create a new query in the RQBE window:

1. **Open the RQBE window.**
2. **Specify database(s) for use in the query.**
3. **Specify join conditions (if you open more than one database).**
4. **Select fields to appear in the query results.**
5. Order the query results.
6. Group the query results.
7. Specify destination of the query results.
8. Specify any selection criteria for query results.
9. Look at the SELECT command created through the RQBE window.
10. **Execute the query (SELECT command).**
11. Save the query.

Open the RQBE Window

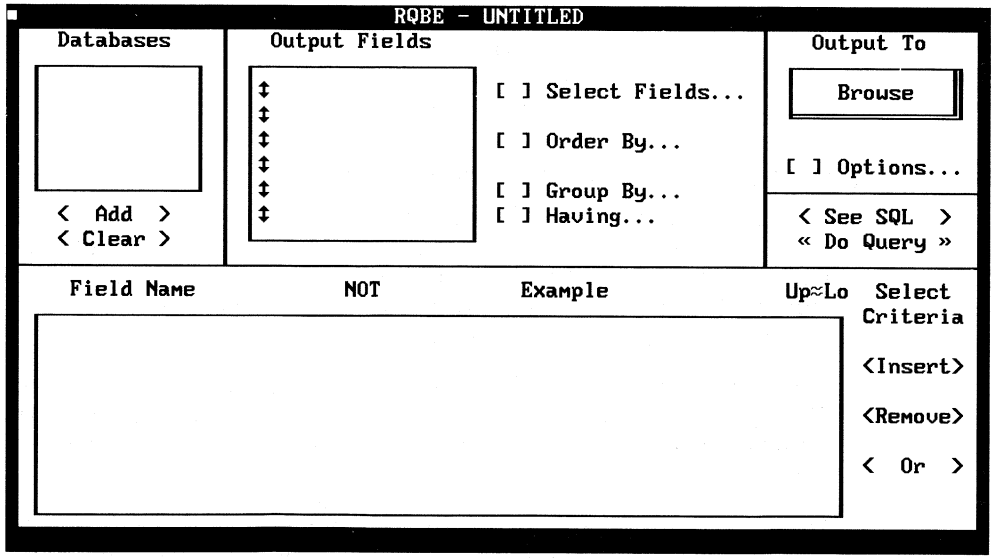
To open the RQBE window so you can create a new query, do one of the following:

- Choose **New...** from the **File** menu popup and choose the **Query** radio button, then choose **OK**.
- Type `CREATE QUERY` in the Command window.

If a database is open in the selected work area, the RQBE window immediately appears and an **RQBE** menu pad is added to the menu bar.

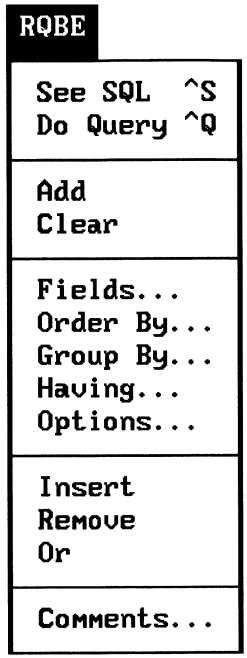
If no database is open in the selected work area, an Open File dialog appears so you can select the database you want to create the query for and choose **Open**. FoxPro opens the database in the selected work area.

The RQBE window appears and an **RQBE** menu pad is added to the menu bar.



RQBE Window

RQBE menu options are discussed throughout this chapter.



RQBE Menu

Specify Database(s) for Use in the Query

If a database is open in the selected work area when you open the RQBE window, the database name appears in the **Databases** list. By default, all of the fields in this database are listed in the **Output Fields** list of the RQBE window. You can specify any additional databases for use in the query.

If you chose **Cancel** in the Open File dialog instead of opening a file in the selected work area, no database names appear in the **Databases** list. You must specify at least one database for use in the query.

To specify a database for use in the query, choose the **Add** push button below the **Databases** list or choose **Add** from the **RQBE** menu popup. The Open File dialog appears. Select the desired database and choose **Open**. The RQBE window is updated with the name of the database displayed in the **Databases** list.

SQL Note: Each database in the **Databases** list appears in the FROM clause of the SELECT command.

Each time you open an additional database, the RQBE Join Condition dialog appears so you can specify the common fields that link the databases in the query.

When you close the RQBE window, databases in the **Databases** list remain open in the View window.

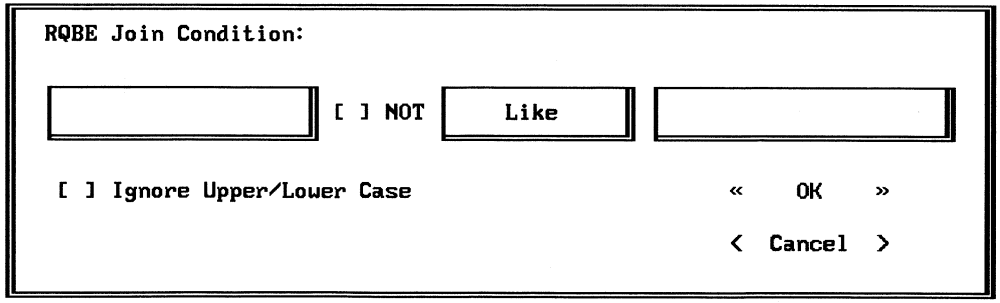
Clear a Database

If you decide not to use a database that appears in the **Databases** list, select the database and choose **Clear** in the RQBE window or from the **RQBE** menu popup. The selected database no longer appears in the **Databases** list and all references to it are removed from the query.

Specify Join Conditions

If you include more than one database in your query, you must specify a *join condition* for each additional database. 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.

Each time you open another database, the RQBE Join Condition dialog automatically appears. You may also display this dialog by double-clicking on one of the databases in the **Databases** list (if more than one database is open in the list).



RQBE Join Condition Dialog

To create a join condition in the RQBE Join Condition dialog:

1. From the left popup, select a field from the database you just selected.

   The field appears on the popup control and will be used to join the database with another database in the **Databases** list.

2. From the center popup, select the type of comparison you wish to make between the fields:

   Like checks if one field matches another.
   Exactly Like checks if one field exactly matches another.
   More Than checks if the value of a field is greater than another.
   Less Than checks if the value of a field is less than another.

   The type of comparison appears on the popup control. If you want the comparison between the fields to be the inverse of that displayed on the center popup control, check the **NOT** check box.

3. From the popup on the right, select a field from another database in the **Databases** list to complete the join condition.

   The field appears on the popup control.

4. If you want FoxPro to ignore capitalization of field data, check **Ignore Upper/Lower Case**.

5. When you are satisfied with the join condition, choose **OK**.

The new join condition appears at the bottom of the RQBE window. Join conditions are marked by a solid bar between the double-headed arrow and the field name.

SQL Note: The join condition(s) are part of the WHERE clause of the SELECT command.

To create additional join conditions, choose the desired databases from the **Databases** list in the RQBE window. The RQBE Join Condition dialog appears so you can specify join conditions.

Modify a Join Condition

To modify a join condition in the RQBE window:

- With the keyboard, Tab to the Field Name of the desired join condition and press Enter.
- With the mouse, double-click on the Field Name of the desired join condition.

The RQBE Join Condition dialog appears so you can make the necessary modifications.

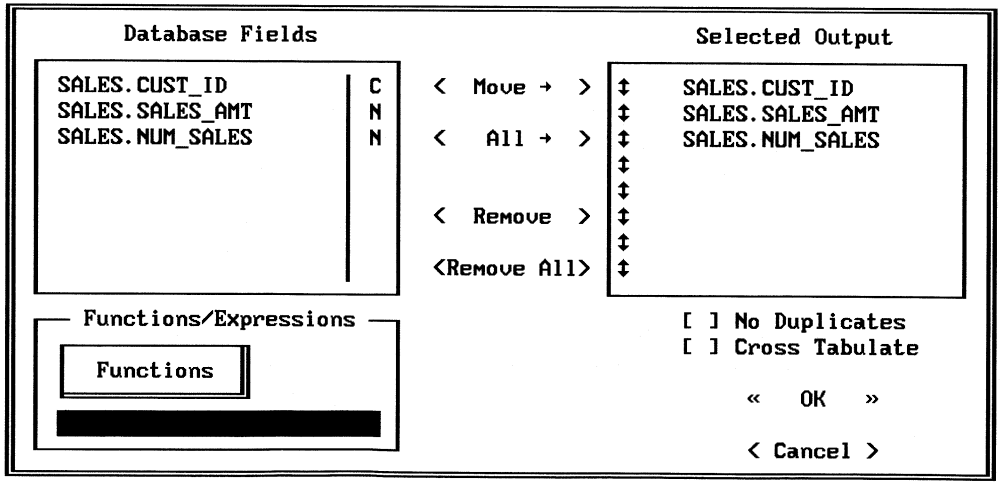
Remove a Join Condition

To remove a join condition from the RQBE window, select the Field Name of the join condition and choose **Remove**.

Select Fields to Appear in Query Results

Before you can select fields to appear in the query results, at least one database must appear in the **Databases** list.

To determine which fields will appear in the query output, check the **Select Fields...** check box in the RQBE window or choose **Fields** from the **RQBE** menu popup. The RQBE Select Fields dialog appears.



RQBE Select Fields Dialog

In the RQBE Select Fields dialog, you can specify which fields, functions and expressions to include, adjust order of fields, remove fields and eliminate duplicate entries in a query.

Specify Fields in a Query

All fields from the databases in the **Databases** list are available for use in the query. You may also include expressions and field functions in a query.

To specify fields for use in the query, do one of the following:

- Select or multi-select each field in the **Database Fields** list that you want to use in the query and choose **Move** → to copy them to the **Selected Output** list.
- Double-click on a field in the **Database Fields** list to copy it directly to the **Selected Output** list.
- Choose **All** → to copy all the fields from the **Database Fields** list to the **Selected Output** list.

SQL Note: The fields in the **Selected Output** list are part of the SELECT portion of the SELECT command.

Adjust Order of Fields in a Query

The order of the fields in the **Selected Output** list is the order of fields in the query result.

To adjust the order of the fields in the **Selected Output** list:

- With the keyboard, Tab until an item in the list is selected then press Ctrl+PgUp and Ctrl+PgDn. If your keyboard supports Ctrl+↑ and Ctrl+↓ you can use these.
- With the mouse, point to the double-headed arrow to the left of the field you wish to move and drag the field to its new location.

You can also adjust the order of selected fields in the **Output Fields** list of the RQBE using the same techniques.

Include Expressions and Field Functions in a Query

You can include expressions and field functions in the query. Possible field functions are:

- COUNT( ) – Counts the number of items in a column. COUNT(*) counts the number of rows in the result table. COUNT(DISTINCT) eliminates duplicate field values before determining the count.
- SUM( ) – Totals a column of numeric data. SUM(DISTINCT) eliminates duplicate field values before determining the sum.
- AVG( ) – Averages a column of numeric data. AVG(DISTINCT) eliminates duplicate field values before determining the average.
- MIN( ) – Determines the smallest value in a column.
- MAX( ) – Determines the largest value in a column.

To include a field function or expression in the query, do one of the following:

- Type the expression or field function in the text box below the **Functions/Expressions** popup control in the RQBE Select Fields dialog.

  If you type a character string literal in the text box, FoxPro will automatically enclose it in quotes when you move it to the **Selected Output** list. If you include a database field in the text box, you must include the database alias and a period before the field name.

- Choose the field function from the **Functions/Expressions** popup and a field on which it will act from the submenu so that they appear in the text box.

When the expression or field function appears in the text box below the **Functions/Expressions** popup, you can choose **Move** → to copy it to the **Selected Output** list. If an expression or field function in the text box does not move to the **Selected Output** list when you choose **Move** →, make sure that the cursor is located in the text box and try again.

Remove Fields or Expressions From a Query

To remove fields from the **Selected Output** list so that they don't appear in the query results, do one of the following:

- Select or multi-select fields and choose **Remove** to remove them from the **Selected Output** list. (Once you have selected fields and chosen **OK** in the RQBE Select Fields dialog, any time you redisplay the RQBE Select Fields dialog you cannot remove all fields from the **Selected Output** list. FoxPro assumes that you want at least one field selected or you would remove the entire database from the **Databases** list in the RQBE window.)
- Double-click on a field in the **Selected Output** list to remove it immediately.
- Choose **Remove All** to remove all fields from the **Selected Output** list.

Eliminate Duplicate Records From a Query

Duplicate records are records in which every field matches. If you want to remove duplicate records from the query results, check the **No Duplicates** check box in the RQBE Select Fields dialog. Otherwise, make sure the **No Duplicates** check box is not checked.

SQL Note: If **No Duplicates** is checked, the word DISTINCT precedes the fields in the SELECT portion of the SELECT command.

Output Query Results in Cross Tabular Format

To output query results to FoxGraph, a report form or a table in cross tabular format, check the **Cross Tabulate** check box. For **Cross Tabulate** to be enabled, three items must appear in the **Selected Output** list. These three items represent the X axis, the Y axis and the cell value for the graph.

When **Cross Tabulate** is checked, **Group By...** and **Order By...** are disabled in the RQBE window. Any established order or group is replaced with a grouping of the first two fields, and no order. Query output is sent to FoxGraph, a report form or a table as determined by GENXTAB.PRG.

For example, if you want to generate a clients report that shows the amount billed to them by month for one year, you could create a graph that displays clients down the left side of the page, January-December across the top of the page and graphs the amount billed to each client each month.

Exit the Select Fields Dialog

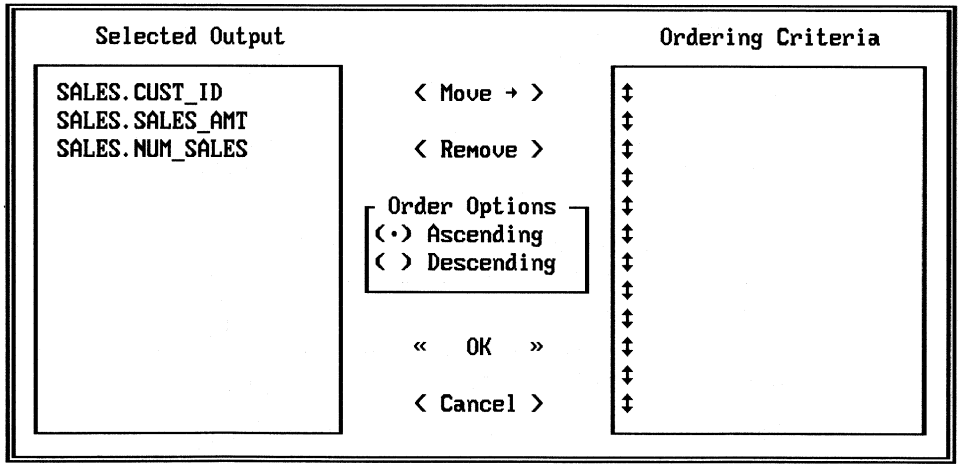
When you are satisfied with the settings in the RQBE Select Fields dialog, choose **OK**. The fields are displayed in the **Output Fields** list in the RQBE window.

In the **Output Fields** list of the RQBE window, you can change the order in which the fields will appear in the query result just as you did in the RQBE Select Fields dialog.

Order the Query Results

Before you can order the query results, you must select the fields to appear in the query results.

When you choose the **Order By...** check box in the RQBE window or choose **Order By** from the **RQBE** menu popup, the RQBE Order By dialog appears so you can specify the order in which the records will appear in your query results. All selected fields from databases in the **Databases** list are available for use in the RQBE Order By dialog.



RQBE Order By Dialog

To specify fields that will determine the order of the query results:

1. Select a field from the **Selected Output** list that will determine the order of the query results.

   If several fields in the **Selected Output** list will affect the order of the query results, you can multi-select them.

2. In the Order Options area, choose the **Ascending** or **Descending** radio button to specify whether data in the field will be organized in ascending or descending order in the query result.

3. Choose the **Move** → push button. The selected field(s) appears in the **Ordering Criteria** list. Once you move selected fields to the **Ordering Criteria** list, you can make modifications to the order of data in each field by selecting the field in the **Ordering Criteria** list and choosing **Ascending** or **Descending**.



A shortcut to copy a field to the **Ordering Criteria** list is to double-click on the field in the **Selected Output** list.

To remove fields from the **Ordering Criteria** list:

1. Select or multi-select the fields that you want to remove.

2. Choose the **Remove** push button. The selected fields no longer appear in the **Ordering Criteria** list.



A shortcut to remove a field from the **Ordering Criteria** list is to double-click on the field in the **Ordering Criteria** list.

The order in which fields appear in the **Ordering Criteria** list determines the order of importance when preparing the query results. The top field is the primary order field.

To adjust the importance of an order field, drag the double-headed arrow preceding the field until the field appears in the desired location in the **Ordering Criteria** list.

SQL Note: **Order By...** adds an ORDER BY clause to the SELECT command. Within the ORDER BY clause, the order fields are listed according to importance.

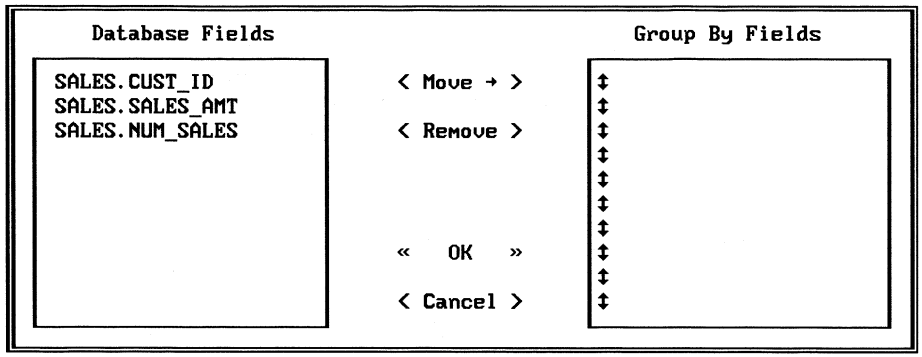
When you are satisfied with your choices in the RQBE Order By dialog, choose **OK**. The RQBE window is updated.

Each order field appears in the **Output Fields** list of the RQBE window with a number next to it, indicating its precedence over other order fields, and an up arrow or down arrow next to it, indicating ascending or descending order.

Group the Query Results

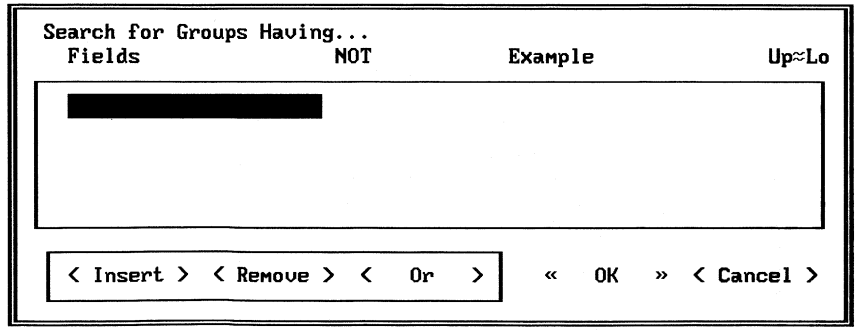
If you want to group records in the query based on the value(s) in a database field or a field function, check the **Group By...** check box. The RQBE Group By dialog appears so you can choose the fields or field functions that will determine how the output will be grouped.

Select or multi-select the fields that will determine the grouping of the query output and choose **Move** to move them to the **Group By Fields** list. **Remove** removes the selected fields from the **Group By Fields** list. When you are satisfied with your choices, choose **OK**.



RQBE Group By Dialog

To specify conditions that groups must meet to be included in the query output, choose the **Having...** push button in the RQBE window. The RQBE Search Conditions dialog appears. Specify conditions for groups in the same way you specified general selection conditions for the query output.



RQBE Search Conditions Dialog

Specify Destination of Query Results

The **Output To** popup control is used to specify where the results of the query (SELECT command) will appear.

When you display the **Output To** popup, the following options are available: **Browse, Report/Label, Table/DBF, Cursor**. Choose one of these options so that it appears on the **Output To** popup control.

SQL Note: Some of these options require commands in addition to the SELECT command. Do not be surprised to see unexpected commands when you choose **See SQL**.

Browse

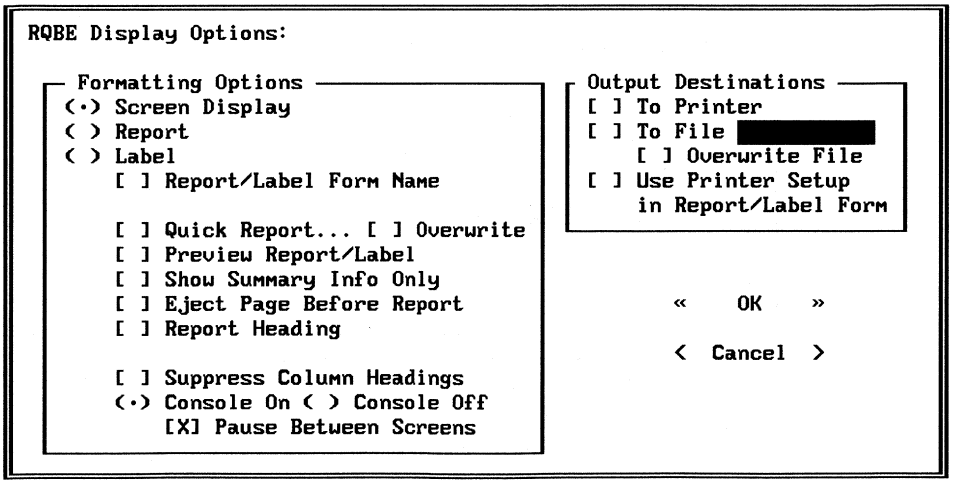
Browse displays query results temporarily in a Browse window. When you choose **Browse** from the **Output To** popup, a text box appears below the **Output To** popup control so you can specify a name for the Browse preference, if desired.

Report/Label

Report/Label sends output to the screen by default. When you choose **Report/Label** from the **Output To** popup, the **Options...** check box is enabled so you can specify formatting options and additional destinations for the output (printer or file).

SQL Note: If **Options...** is unchecked, output appears on the screen.

When you check **Options...** or choose **Options...** from the **RQBE** menu popup, the RQBE Display Options dialog appears.



RQBE Display Options

This dialog has two areas: Formatting Options and Output Destinations.

RQBE Display Options – Formatting Options

In the Formatting Options area of the RQBE Display Options dialog, you have three general formatting choices, each with additional options.

Screen Display This option is chosen by default and causes query output to appear with fields ordered as specified in the RQBE window.

Report Displays query results in an existing or a new report layout. When this radio button is chosen, a REPORT FORM command appears in the query.

Label Displays query results in an existing or a new label form. When this radio button is chosen, a LABEL FORM command appears in the query.

Additional options in the Formatting Options area of the RQBE Display Options dialog are available depending on the general formatting option chosen from the list above:

- **Report/Label Form Name** is enabled when the **Report** or **Label** radio button is chosen. Check this check box to display the Open File dialog so you can choose the name of an existing report or label form or specify a new one. Alternately, you can type the name of the report or label form in the text box below the **Report/Label Form Name** check box.
- **Quick Report...** is enabled when you specify a new report. When you check **Quick Report...**, a Quick Report dialog appears so you can choose layout options and specify a name for the new report.
- **Overwrite** is enabled when **Quick Report...** is checked. If this check box is checked and a report with the same name exists, that report is overwritten.
- **Preview Report/Label** is enabled when the **Report** or **Label** radio button is chosen. If this check box is checked, a representation of the report is sent to the screen so you can check the content and layout before the report is printed. To print the report you must uncheck this check box and choose **Do Query** again.

- **Show Summary Info Only** is only available when the **Report** radio button is chosen. When this check box is checked, detail lines in the report are not output. Only totals and subtotals are output.
- **Eject Page Before Report** is disabled unless the **Report** radio button is chosen. **Eject Page Before Report** is checked by default so that one page is ejected before the report is output. If you uncheck this check box, a form feed does not precede the output.
- **Report Heading** is disabled unless the **Report** radio button is chosen. If you want to specify an additional heading line to be placed on each page of the report, check **Report Heading**. The Expression Builder appears so you can specify a character expression for the heading. Alternately, you can type the heading in the text box below **Report Heading**. If both **Report Heading** and **Suppress Column Headings** are checked, **Suppress Column Headings** takes precedence.
- **Suppress Column Headings** is available when **Screen Display** or **Report** is chosen. When you check this check box, headings do not appear at the top of every page.
- **Console On** and **Console Off** determine whether output appears on the screen. When **Console On** is chosen, output appears on the screen. When **Console Off** is chosen, screen output is suppressed.
- **Pause Between Screens** is only available when the **Screen Display** radio button is chosen. By default, this check box is checked so that output pauses after every screen full of information and FoxPro asks you to press a key to continue. If you uncheck **Pause Between Screens**, output scrolls off the screen automatically when the screen becomes full.

RQBE Display Options – Output Destinations

In the Output Destinations area of the RQBE Display Options dialog, you can specify additional destinations for query output.

To send the query output to the printer, check **To Printer**.

To send the result to a file, do one of the following:

- Type the file name in the text box next to the **To File** check box. An "X" automatically appears in the **To File** check box.

- Choose the **To File** check box to display the Print Query To dialog. Choose an existing file or type a name for the new file in the text box and choose **OK**. The RQBE Display Options dialog is updated with the **To File** check box checked.

When the **To File** check box is checked, the **Overwrite File** check box is enabled. If you want any existing contents of the specified file to be overwritten, check **Overwrite File**. If **Overwrite File** is not checked, the output is added to the specified file following any existing contents.

If **To Printer** or **To File** is checked, the query resultsare sent to the printer or to a file. To determine whether the results of the query also appear on the screen, choose **Console On** or **Console Off** in the Formatting Options area.

To specify that the printer driver saved with the specified report or label should be used, check the **Use Printer Setup in Report/Label Form** check box. For this check box to be enabled, the **Report** or **Label** radio button must be chosen, **Preview Report/Label** must be unchecked, and **To Printer** must be checked.

When you are satisfied with your display options, choose **OK**. The RQBE window is updated.

Table/DBF

When you choose **Table/DBF** from the **Output To** popup, an Open File dialog appears so you can specify a database where the query results will be stored.

If the desired database exists, select it from the list and choose **Select**. If you want to create a new database, make sure the drive and directory settings are correct and type the new name in the text box at the bottom of the dialog. Choose **Select**.

The RQBE window is updated with **Table/DBF** on the **Output Into** control and the fully-qualified database name is placed in a text box below the **Output To** popup control. Adjustments may be made in this text box, if desired.

Cursor

Cursor temporarily stores the query results in read-only form. The cursor appears in the View window and is available for browsing, reporting, and so on until you close it. Once you close the cursor, it is gone.

When you choose **Cursor** from the **Output To** popup, a text box containing the name of your RQBE window appears below the **Output To** popup control. If you want to rename the temporary database, type a name in the text box.

Graph

Graph sends query results to FoxGraph, an optional package that can be purchased. When **Graph** appears on the **Output To** popup control and you choose **Do Query**, FoxPro sends query results to the file specified by _GENGRAPH, which is typically FoxGraph. For **Graph** to be enabled, GENGRAPH.PRG must be in the directory where FoxPro is located or in a location you specify with _GENGRAPH in CONFIG.FP.

The first item from the **Output Fields** list provides the row data for the graph and any other numeric items in the **Output Fields** list are graphed against the row data. You can make adjustments to the graph from within FoxGraph.

Specify Any Selection Conditions

At the bottom of the RQBE window, you can specify conditions that records must meet to appear in the query results.

To specify a record condition:

1. Choose a field from the **Field Name** popup or choose **<expression...>** to bring forward the Expression Builder so that you can create an expression as part of the conditions that records must meet.
2. Choose the type of comparison from the comparison popup.

   Like checks if one field matches another.
   Exactly Like checks if one field exactly matches another.
   More Than checks if the value of a field is greater than another.
   Less Than checks if the value of a field is less than another.
   Between checks if a field is within a range of values.
   In checks if a field is in a given set of values.

   If you want the comparison between the related fields to be the inverse of that displayed on the comparison popup control, check the **NOT** check box.

3. Enter the comparison criteria in the **Example** text box.

   Do not enclose character string literals in quotation marks unless the string is the same as the name of a field in a database in the query.

   Do not enclose date literals in braces.

   Do place a period before and after a logical literal (.T.).

   If you enter a field name from a database in the query, FoxPro will recognize that it is a field.

4. If you want RQBE to ignore the capitalization of character data in a condition, check the **Up≈Lo** check box.

SQL Note: The condition(s) you specify appears in the WHERE clause of the SELECT command.

Insert, Remove and Rearrange Conditions

Once you have a list of conditions, you can insert new ones, remove existing ones or rearrange them.

To insert a new condition before the selected condition, choose the **Insert** push button in the RQBE window or choose **Insert** from the **RQBE** menu popup.

To remove the selected condition, choose **Remove** in the RQBE window or from the **RQBE** menu popup.

To change the order of the conditions with the keyboard, Tab to the field name and press Ctrl+PgUp or Ctrl+PgDn. If your keyboard supports Ctrl+↑ and Ctrl+↓ you can use these. With the mouse, drag the double-headed arrow next to a condition to the desired location in the list.

Group Record Conditions

Each condition you create at the bottom of the RQBE window is combined with existing conditions using the AND operator. For a record to be included in the query results, it must meet all the conditions.

If you want to group the conditions that records must meet to be included in the query results:

1. Drag the conditions into the desired order.

2. Choose the **Or** push button or choose **Or** from the **RQBE** menu popup.

   A double line containing the word "OR" appears below the conditions so you can delineate the groups. Wherever a double line appears in the condition list, an OR operator is added between group of conditions above and below the double line. To be included in the query results, a record can meet the group of conditions above the double line *or* the group below the double line.

3. Drag the double line to the desired location to create groups of conditions.

Any join conditions are automatically combined with all the groups of conditions using the AND operator unless you drag the join condition inside of a group.

You can remove a group by selecting the double line and choosing the **Remove** push button or choosing **Remove** from the **RQBE** menu popup.

Look at SELECT Command

At any stage during the creation of a query, you can see the associated SELECT command by choosing **See SQL** in the RQBE window or from the **RQBE** menu popup. When you choose **See SQL**, a read-only editing window appears so you can see the SELECT command that you created with the RQBE window. **See SQL** is a handy way to learn the syntax of the SELECT command.

You can copy a query from the query editing window and paste it into a program or the Command window using normal FoxPro editing techniques.

You may want to store comments about the query with it for your reference. To do this, choose **Comments...** from the **RQBE** menu popup. Type any comments in the text editing area of the Comment dialog that appears.

Execute the Query (SELECT Command)

The **Do Query** push button and menu option are disabled until your query contains all the necessary parts. When you are satisfied with the settings in the RQBE window and you want to test your query, choose **Do Query**. FoxPro executes the SELECT command you created.

Save the Query

Before you save a query, you have the option of storing comments for your personal use with the query. Choose **Comments...** from the **RQBE** menu popup to display the Comment dialog so you can type notes to yourself.

When you are satisfied with the query you have created, you can save it in a file with a .QPR extension for future use. To save a query, choose **Save** from the **File** menu popup.

- If the query was already named, the modifications are saved and the query name remains the same.
- If the query was untitled when you chose **Save** from the **File** menu popup, the Save As dialog appears so you can specify a name for the new query. Enter the name in the text box and choose **Save**. The RQBE window is updated with the name in the title bar.

If you don't specify an extension for the query, it is given a default extension of .QPR. A .QPR file can be reopened in the RQBE window as described in the section titled Modify an Existing Query with RQBE. You can also open a .QPR file in a query editing window. The query editing window contains the SELECT command that you created in the RQBE window. You can make adjustments to the command, save changes and execute the .QPR file like a program.

Modify an Existing Query with RQBE

RQBE makes it easy for you to modify existing queries. To modify an existing query in the RQBE window:

1. Open the RQBE window for the query.
2. Determine and make modifications.
3. Look at the modified SELECT command.
4. Execute the modified query (SELECT command).
5. Save the modified query.

Open the RQBE Window for the Query

To display the RQBE window for an existing query, do one of the following:

- Choose **Open...** from the **File** menu, make sure **Query** is showing on the **Type** popup control, select the name and choose **OK**.
- Type `MODIFY QUERY` in the Command window.

Determine and Make Modifications

When you have determined what modifications need to be made, refer to the appropriate portion of Creating a New Query with RQBE (Relational Query By Example) for additional information on using different parts of the RQBE window.

Look at the Modified SELECT Command

To look at the modifications you make to the query, choose **See SQL** in the RQBE window or from the **RQBE** menu popup.

Execute the Modified Query

To execute the modified query, choose **Do Query** in the RQBE window or from the **RQBE** menu popup.

Save the Modified Query

When you are satisfied with the query modifications, you can save them by choosing **Save** from the **File** menu popup.

15 Report Writer

The FoxPro Report Writer is a powerful report form generator you use to design custom reports in nearly any format. The Report Writer makes it easy to select the information you need and format it in a variety of ways to produce impressive reports. You can create report variables to perform calculations (e.g., average, geometric mean) instead of writing user-defined functions.

You create reports by placing objects — text, fields, lines and boxes — in the bands of a Report Layout window. These objects can be manipulated in a variety of ways until the report looks just the way you like. You can preview the report before it is printed to make sure it is perfect.

When you save a report, all information about the report is saved in a database with an .FRX extension.

About this Chapter

This chapter documents all features of the FoxPro Report Writer. Topics are presented in the following order:

- Starting the Report Writer
- The Report Layout window and how to use the bands in the Layout window
- Types of objects that can be defined
- How to manipulate objects in the Report Layout window
- Options on the **Report** menu popup including instructions on how to define and place objects in the Report Layout window

The options on the **Report** menu popup are described in the order they appear. All dialogs associated with the menu options are also described.

This chapter does not include a tutorial on report design. Instructions for beginners are available in the Report Writer chapters of the FoxPro *Getting Started* manual. Information for advanced users is available in the FoxPro *Developer's Guide*.

Starting the Report Writer

Before you start the FoxPro Report Writer, you can create a working environment by opening the necessary database(s) and index(es), setting the index order, and establishing relations for the report. This environment information may be saved in the .FRX database for use each time you run the report. Saving the report environment information is described later in this chapter.

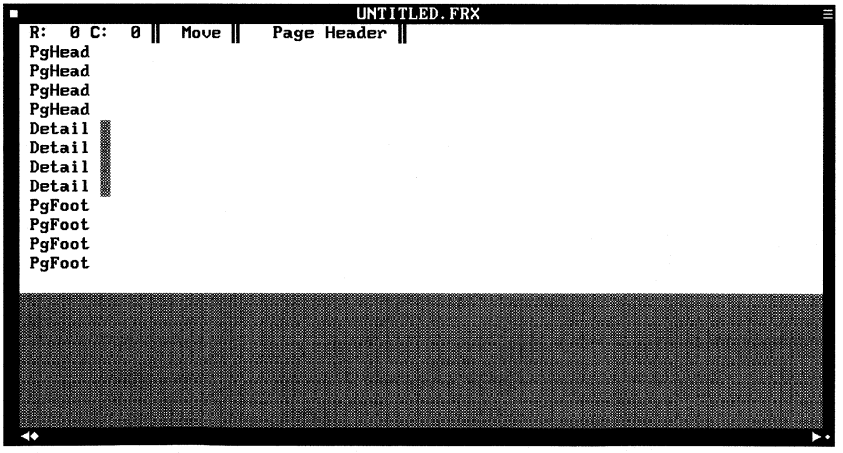
When you open an existing report form, the environment information for the report is automatically restored if **Restore Environment** is checked in the Open File dialog.

Creating a New Report

You can start the FoxPro Report Writer through menu selections or by typing commands in the Command window.

To create a new report form:

1. Choose **New...** from the **File** menu popup.
2. Choose the **Report** radio button in the New File dialog.
3. Choose **OK**. An untitled Report Layout window appears.



Report Layout Window

If you prefer, you can create a new report from the Command window by typing:

```
CREATE REPORT
```

A Report Layout window appears with UNTITLED.FRX as its title. The report will be given a new name the first time it is saved. Alternately, you can type:

```
CREATE REPORT <filename>
```

in the Command window. A Report Layout window appears with the file name followed by the default .FRX extension as its title.

Modifying an Existing Report

To modify an existing report form:

1. Choose **Open...** from the **File** menu popup.
2. Choose the report form file you want to open from the Open File dialog.

To open an existing report through the Command window, type:

```
MODIFY REPORT <filename>
```

If you do not specify a file name with this command, an Open File dialog appears. Select a file then choose **Open**. The Report Layout window appears with the report displayed as it was previously saved.



If the environment information saved with a screen becomes invalid (e.g., an index tag no longer exists), the screen will open without error.

Multiple Report Layout windows



You can open several Report Layout windows at the same time. The number of Report Layout windows you may have open at once is limited only by available memory and available file handles. When multiple Report Layout windows are open you can copy and paste objects between reports. When you copy an object, all information associated with the object is copied as well.

Report Layout Window

A new Report Layout window has three bands that are labeled at the left edge of the window. Additional bands become available when you define groups, title page and summary. Each band may contain text, database fields, computed fields, calculated values, lines and boxes.

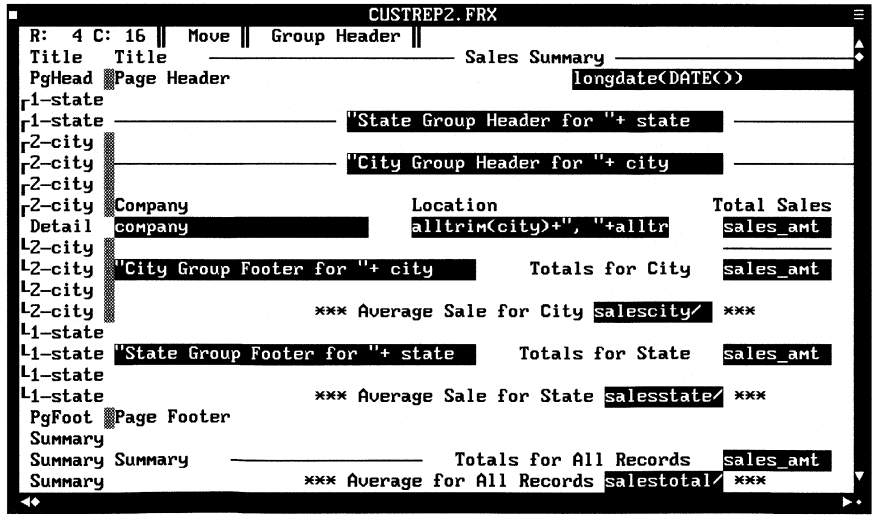
A status bar is located at the top of the Report Layout window. This bar displays the row, the column and the band in which the cursor is currently positioned. It also displays the current activity, such as defining a field or drawing a box.



The way reports are displayed in the Report Layout window varies according to your color settings, environment settings and the video display you are using. How objects appear when they are *highlighted*, *selected* or *blinking* may vary according to the settings on your machine.

Band Types

The bands and examples of how they are used are displayed in the picture that follows. Definitions and descriptions of each band follow the diagram.



Report Layout Window with CUSTREP2.FRX

> Unless otherwise noted, all pictures in this chapter are from the CUSTREP2.FRX report. This report and all associated files are located in the FOXPRO25\COMMFUNC\ directory.

Title

The Title band contains information that appears before the main report. A report title can be as simple as the name of the report at the top of the first page, or it can be an introductory paragraph or even a cover letter. It's anything that you want to appear on the first page of your report. The information contained in the Title band is printed once for the entire report.

Page Header

At the top of each page of the main report is the Page Header band (PgHead). The Page Header usually contains a combination of fixed and variable data. A Page Header might include the following: title, date, page number, etc.

Group Header

When data is grouped, each group may have a Group Header printed before it. These headers help to identify the information that is contained within each level of grouping.

Detail Band

The Detail band that makes up the report body usually contains field information from the selected database(s). The information printed in the Detail band usually comes directly from database fields or from calculations performed on the fields.

Group Footer

When data is grouped, each group may have a Group Footer printed after it. These footers may give summaries and/or subtotals of the information that is contained within each level of grouping.

Page Footer

At the bottom of each page of the main report is the Page Footer band (PgFoot). Like the Page Header, the Page Footer usually contains a combination of fixed and variable data, report name, date, page number, etc. It may also include summary information (such as totals or averages) for data on that page.

Summary

The Summary is one or more pages which appear after the main report. It can contain summary information (totals or averages) or text that summarizes the contents of the report. Like the Title, it is printed once per report.

Empty Bands

If a band does not contain any objects, the name of the band is dimmed in the left column of the Report Layout window. When a band name is dimmed, the band is ignored when printing the report or viewing the report with the **Page Preview...** option. No lines are allocated in the printed or viewed output for a band that is dimmed in the Report Layout window. The first line of the output is the first line of a band in which an object is defined.

If the band contains any objects, the band name in the left column of the Report Layout window is highlighted and all lines appearing in the report definition appear in the printed report and in Page Preview.

Changing Band Size

A band can be any size you like. To change the size of a band with the keyboard:

1. Position the cursor in the band you wish to resize.

2. Choose **Add Line** or **Remove Line** from the **Report** menu popup (or press Ctrl+N to add a line and Ctrl+O to remove a line).

If you try to delete a line that contains objects, an alert appears asking if you want to delete the objects on this line. Choosing **Yes** deletes the line and the objects it contains. Choosing **No** returns you to the Report Layout window without deleting the line or the objects.

To change the size of a band with the mouse:

1. Position the pointer on the text (on the left side of the Report Layout window) of the band you wish to resize. For example, if you want to resize the Detail band, position the pointer on the word "Detail" on the left side of the Report Layout window.
2. Drag the mouse down to add lines to the band, or up to delete lines from the band. New lines are added or removed before the line on which the pointer is positioned. You cannot use this method to remove lines that contain objects.
3. When the band is the desired size, release the mouse button.

Each band in the report may vary in the number of lines it contains. The maximum number of lines in a report definition is 255.

Sizing a band in which a box or line exists can resize the box or line. If lines are added or deleted to any portion of the band in which the box or line is placed, the box or line will stretch or shrink. Adding or removing lines from a band above or below the lines in which the box or line is placed will not affect the size of the box or line.

Automatic Scrolling

The Report Layout window scrolls automatically when you stretch or move beyond the borders of the Report Layout window.

Report Writer Objects

FoxPro reports are composed of objects that can be manipulated in a variety of ways. These objects include graphic objects, field objects and text objects.

Graphic Objects Lines and boxes are available for use in reports. These optional items often make reports aesthetically pleasing as well as easier to comprehend.

Field Objects Field objects display data from a database field from the current work area or any related database, from a calculated value, from a computed field or from a user-defined function. The data displayed is determined by the expression defined for that field.

Text Objects In the Report Layout window, text is treated as an object and can be selected, moved, stacked or deleted.

Creating Objects

Options on the **Report** menu popup allow you to create the objects described above. For descriptions of each object type and how to define objects, see the appropriate sections later in this chapter.

Moving Among Objects

When several objects are present in the Report Layout window, you can press Tab and Shift+Tab to move from object to object. The cursor moves from object to object in the Report Layout window from left-to-right and top-to-bottom, one object at a time.

Selecting Objects

Press the Spacebar when the cursor is positioned on an object to select it. With the mouse, position the pointer on the desired object and click to select the object.

With the keyboard, you can select more than one object by selecting the first object, then simultaneously pressing the Shift key and the arrow keys to move the cursor to the next object. With the cursor on the next object, press Shift+Spacebar. Continue until all desired objects are selected.

Select multiple objects with the mouse by holding down the Shift key and clicking on the desired objects. Hold down the Shift key and double-click on a report band to select all objects in the band.

Selection Marquee

Multiple objects can also be selected using a selection marquee. The selection marquee appears as a dotted line in the Report Layout window.

To use the selection marquee with the keyboard:

1. Position the cursor outside the objects to be selected.
2. Press the Spacebar to anchor the marquee. A dot will appear in the Report Layout window in place of the cursor.
3. Use the arrow keys to draw the marquee around the objects to be selected.
4. Press Enter. All objects contained in the marquee are selected. Objects that are only partially contained in the marquee are selected as well.

To use the selection marquee with the mouse:

1. Position the pointer outside the objects to be selected.
2. Press the mouse button and drag the mouse around the desired objects.
3. Release the mouse button. All objects contained in the marquee are selected. Objects that are only partially contained in the marquee are selected as well.

Use the keyboard or mouse to select any combination of objects. When multiple objects are selected they act as one object to be moved, cut, copied, pasted or deleted.

Inverting Objects

You can invert objects using the selection marquee. When you invert objects, selected objects become deselected and objects that weren't selected become selected.

To invert objects with the keyboard:

1. Press the Shift key, then use the arrow keys to position the cursor outside of the objects you wish to invert.
2. Hold down the Shift key and press the Spacebar to anchor the selection marquee. A dot appears in the Report Layout window in place of the cursor.

3. Use the arrow keys to draw the selection marquee around the desired objects.
4. When the marquee surrounds the desired objects, press Enter. Objects that are selected become deselected and objects that are deselected become selected.

To invert objects with the mouse:

1. Press the Shift key, then draw the marquee around the objects by dragging the mouse.
2. Release the mouse button. Objects that are selected become deselected and objects that are deselected become selected.

Deselecting Objects

When objects are selected in the Report Layout window, you may deselect *all* selected objects.

To deselect all objects with the keyboard:

1. Hold down the Shift key and use the arrow keys to position the cursor in an empty area of the Report Layout window (not on an object).
2. Press the Spacebar. All selected objects are deselected.

To deselect all objects with the mouse:

1. Position the pointer outside any selected objects in the Report Layout window.
2. Click the mouse button. All selected objects are deselected.

To deselect single objects with the keyboard when multiple objects are selected with the keyboard:

1. Hold down the Shift key and press the arrow keys until the cursor is positioned on the object you want to deselect.
2. Press the Spacebar. The specified object is deselected while all other selected objects remain selected.

To deselect single objects with the mouse when multiple objects are selected with the mouse:

1. Position the pointer on the object you wish to deselect.
2. Shift+click on the selected object you want to deselect.

Object Dialogs

Every object in the Report Layout window has an associated dialog.

To bring forward the dialog for an object with the keyboard:

1. Position the cursor on the desired object.
2. Double-click with the Spacebar or press Enter. The dialog for the specified object appears.

To bring forward the dialog for an object with the mouse:

1. Position the pointer on the desired object.
2. Double-click on the object. The dialog for the specified object appears.

Object Comments

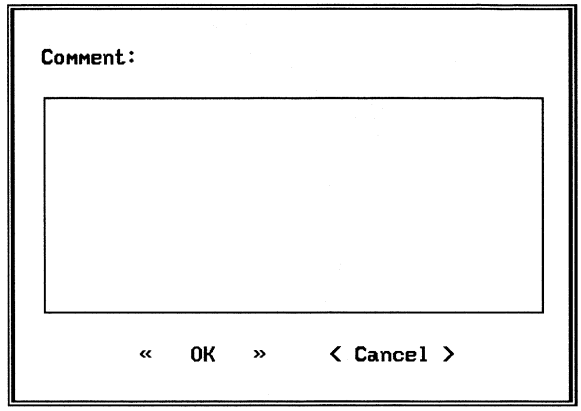
Every object you create may be assigned an associated comment. The comment may:

- Serve as a reminder about the object.
- Contain a code snippet to be used in an application. Code snippets written in the comment dialog are for reference purposes only. They are not executed by the Report Writer. Code snippets in the Comment dialog must be copied and inserted into a procedure file.
- Contain an unlimited amount of information, including binary data.

The primary dialog for each object contains a **Comment...** check box. Checking this box displays the Comment dialog where you may create a comment or modify an existing comment.

All FoxPro editing features (cut, copy, paste, undo, clear, etc.) are available in the Comment dialog. Comments are stored in memo fields in the .FRX database.

To enter comments, choose the **Comment...** check box in the primary dialog for the defined object. The Comment dialog appears.



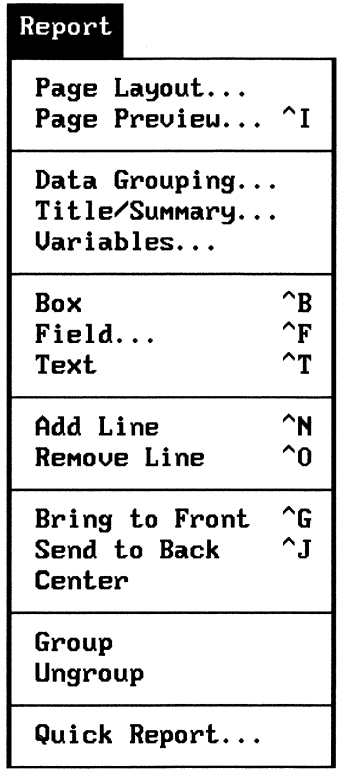
Comment Dialog

Enter your comments in the text editing area of this dialog. If your comments are lengthy, a scroll bar appears at the right of the editing area, allowing you to make your comments as long as you like.

When you are finished writing your comments, choose **OK** to return to the primary dialog for the specified object.

Report Menu

When you start the Report Writer, a **Report** menu pad is added to the menu bar.



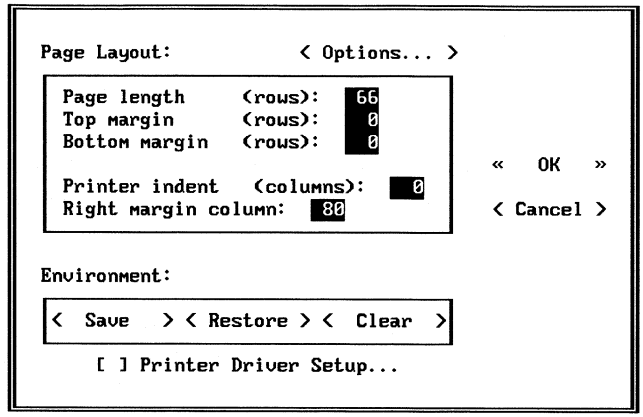
Report Menu Popup

The options on this menu popup allow you to create or modify a report definition file quickly and easily. An explanation of each **Report** menu option follows.

Page Layout...

Specify page layout

Page Layout... is used to define where on the page a report is printed and specify options pertaining to the printing of a report. You can also use this menu option to save or modify the report environment. Choose this option and the Page Layout dialog appears.



Page Layout Dialog

In the Page Layout section of this dialog, you can adjust the following settings:

Page length — The number of lines that you want to appear on each page of a report.

Top/Bottom margin — The number of blank lines that appear at the top and bottom of each page of a report.

Printer indent — The number of columns indented from the left edge of the printed page.

Right margin column — The number of columns across the page for printed output.

Printer Driver Setup Choose this check box to bring forward the Printer Driver Setup dialog. Settings made in the Printer Driver Setup dialog are saved in the .FRX database. For information on printer drivers, see the Printer Setup Dialog section in this manual. For information on defining your own printer drivers, see the Printer Drivers chapter of the FoxPro *Developer's Guide*.

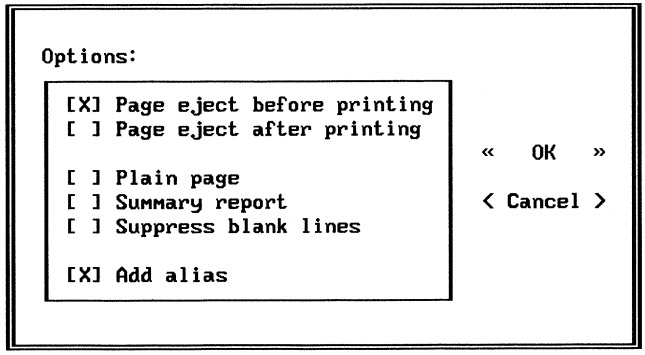
Example:

- The maximum number of columns on a printed page for the type style you are using is 80.
- You want a report to print 70 characters across the page with a 5 column margin once each side of the page.
- You would set the printer indent to five, and the right margin column to 70.

You can change any of the values displayed in this dialog by selecting the value you want to change and typing the new value. The maximum width of a report is 255 columns.

Page Layout Options

Choosing the **Options...** push button at the top of the Page Layout dialog displays an Options dialog.



Page Layout Options Dialog

The Options dialog contains four check boxes: **Page eject before printing**, **Page eject after printing**, **Plain page**, **Summary report** and **Add Alias**.

These options perform the following actions:

Page eject before printing — An initial form feed is executed prior to the printing of the report.

Page eject after printing — A form feed is executed after the printing of the report.

Plain page — Suppresses the printing of page headers. Headers will print on the first page of the report, but not on subsequent pages. Page footers are not suppressed. Page footers are printed on all pages of the report.

Summary report — Suppresses the printing of detail lines in the report. Information in all other bands (title, page header, group headers and footers, page footer and summary) is printed. This summary may be seen with **Page Preview...** before the report is printed.

Suppress Blank Lines — Removes lines in the *Detail* band of a report that contain only blank fields from the report. If the report line contains other fields or text (in addition to the blank field), the line is not suppressed.

A field must be *blank* to be affected by this options. For example, if a numeric field contains no data, its value is 0 (zero). It is not a blank field. You can, however, check the **Blank if Zero** check box in the Format dialog to make numeric fields that contain 0 (zero) blank fields. (This places an @Z in the Format text box in the Report Expression dialog.) The report line containing the field will then be removed.

Suppress Blank Lines does not remove lines with no objects from the Detail band. For example, if the Detail band in your report is defined to be five lines deep and only three of the lines contain objects, the report prints five lines for the Detail band. You can manually remove empty lines from a report with the **Remove Line** option on the **Report** menu popup, or by dragging the Detail band until it is the desired size.

Add Alias Adds alias to all fields defined in the Report Layout window.

Saving Report Environment Information

At the bottom of the Page Layout dialog are three push buttons that affect report environment information: **Save**, **Restore** and **Clear**.

The following information about the environment can be saved with a report:

- Open database files in all work areas
- The currently selected work area
- Index order on any open database file
- Any relations that have been set
- Any SET SKIP TO condition

When you create a report there are usually open databases, indexes, etc., that you will want to use whenever you modify or print the report. The **Save** push button in the Page Layout dialog is used to save this environment information in the .FRX database when the report is saved.

Restoring Report Environment Information

If you have changed the environment by opening or closing databases, indexes, etc. while modifying a report, you can restore the environment information previously saved with the report by choosing the **Restore** push button in the Page Layout dialog. The **Restore** push button will be disabled if there is no environment information saved for the report.

Clearing Report Environment Information

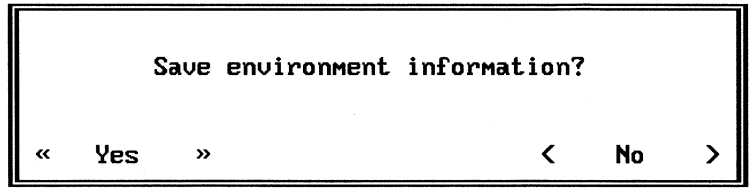
You can clear the environment information previously saved with the report by choosing the **Clear** push button in the Page Layout dialog.

The **Clear** push button is disabled if there is no environmental information saved for the report.

Saving the Report

Choose **Save** from the **File** popup menu to save the report. Any modifications to the report are saved on disk. The first time you save the report, you will be prompted to name the report file.

If you have not previously saved the environment information, an alert appears asking if you want to save the environment information now.



Save Environment Alert

Choosing **Yes** saves the environment information in the corresponding fields of the .FRX database on disk. Choosing **No** saves the report without environment information.



If the environment information saved with a report becomes invalid (e.g., an index tag no longer exists), the report will open without error.

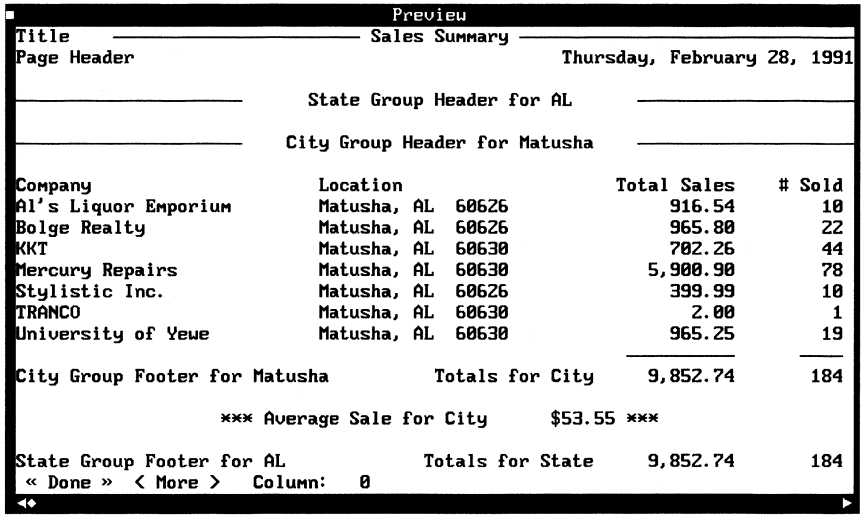
Page Preview...

Displays representation of report document

Page Preview... shows you an accurate representation of the report, including text, fields, lines and boxes. Use this option to check the report before you print it. When you choose **Page Preview...**, the top of the first page of your report is displayed.



CUSTREP2.FRX contains a user-defined function called LONGDATE.PRG. Set your path to the directory in which this program is located before you choose **Page Preview...** or run the report.



Preview

Title — Sales Summary

Page Header — Thursday, February 28, 1991

State Group Header for AL

City Group Header for Matusha

Company	Location	Total Sales	# Sold
Al's Liquor Emporium	Matusha, AL 60626	916.54	10
Bolge Realty	Matusha, AL 60626	965.80	22
KKT	Matusha, AL 60630	702.26	44
Mercury Repairs	Matusha, AL 60630	5,900.90	78
Stylistic Inc.	Matusha, AL 60626	399.99	10
TRANCO	Matusha, AL 60630	2.00	1
University of Yewe	Matusha, AL 60630	965.25	19
City Group Footer for Matusha	Totals for City	9,852.74	184

*** Average Sale for City $53.55 ***

State Group Footer for AL — Totals for State 9,852.74 184

« Done » < More > Column: 0

Page Preview Window with CUSTREP2.FRX

The size of the Page Preview window corresponds to the size of the Report Layout window. The Page Preview window cannot be sized or zoomed. If you would like the Page Preview window to be displayed at a different size, you must resize the Report Layout window and then choose **Page Preview...** from the **Report** menu popup. If the report definition is wider than the Page Preview display, you can scroll to see the rest of the report.

To page forward through the report, press PgDn or choose the **More** push button at the bottom of the Page Preview window. Press Escape or choose the **Done** push button to return to the Report Layout window. To view the report from the beginning, choose **Page Preview...** again from the **Report** menu popup.



In the Page Preview window, you can page forward through the report. You cannot page backward.

Data Grouping...

Print header/footer for common data

While sorting or indexing a database will cause the records to be printed in a specified order, many times you will want to separate the records into groups. The **Data Grouping...** option on the **Report** menu popup allows you to create up to 20 separate groups of data and perform operations on those groups. These operations include:

- Performing calculations on records within a specified group
- Printing text in headers and footers to identify specific groups
- Executing a form feed to begin printing each group on a new page
- Resetting page numbers when groups are printed on a new page

Single Group Reports

A single group report has just one level of data grouping. An example of a single group report is a report where all records in the same state are grouped together. A group with one level of data grouping needs to be ordered on only one field.



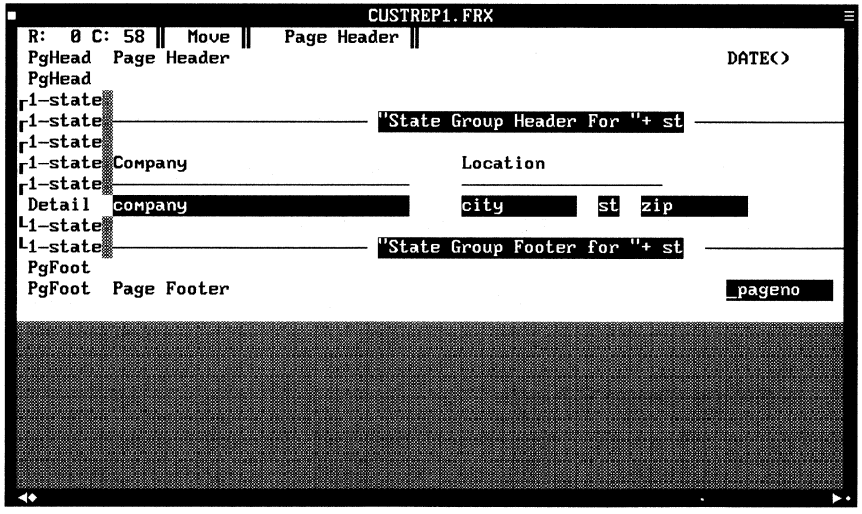
The order in which the records are sorted or indexed is critical to a group report — all the records belonging to one group should be printed before records belonging to the next group.

Grouping data simply prints headers and footers each time a group value changes in the database. It does not order the records in the database. Sorting or indexing must be performed outside of the Report Writer.

In this single group report, whenever the value of STATE changes, a "break" occurs and group headers and footers are printed.

The following picture shows the Report Layout window with one level of data grouping. The printed report that follows shows the data that is printed in each band of the report.

> Pictures for the single-group report are taken from the CUSTREP1.FRX report. This report is located in the FOXPRO25\COMMFUNC\ directory.



Report Layout Window with CUSTREP1.FRX

Page Header 07/23/91

State Group Header For AL

Company	Location		
Al's Liquor Emporium	Matusha	AL	60626
Bolge Realty	Matusha	AL	60626
KKT	Matusha	AL	60630
Mercury Repairs	Matusha	AL	60630
Stylistic Inc.	Matusha	AL	60626
TRANCO	Matusha	AL	60630
University of Yewe	Matusha	AL	60630

State Group Footer For AL

State Group Header For CA

Company	Location		
Church of Hope	Burningsway	CA	10786
Clemente Music Co.	Burningsway	CA	10766
Forest Dry Cleaning	Burningsway	CA	10766
L.H.H.F. of America	Burningsway	CA	10786
MidWest Insurance	Burningsway	CA	10766
Art Associates	San Rolfos	CA	10514
Athletique Inc.	San Rolfos	CA	10522
Beta Technologies	San Rolfos	CA	10514
Cerkin Engineering	San Rolfos	CA	10522
Daffodils Incorporated	San Rolfos	CA	10514
DataTech Inc.	San Rolfos	CA	10514
Traditional Toys	San Rolfos	CA	10522
Blenders R Us	Tipton	CA	10920
Falk & Stein Pharmaceutical	Tipton	CA	10920
Logan Saw Mill	Tipton	CA	10944
Maloney Theatrical Co.	Tipton	CA	10944
Redding Auto Service	Tipton	CA	10944

State Group Footer For CA

State Group Header For NY

Company	Location		
AAAA International	Poughkeepsi	NY	97788
Thurston & Parry Assoc.	Poughkeepsi	NY	97788

State Group Footer For NY

State Group Header For OH

Company	Location		
Colby Pre-School	Findlay	OH	45840
Country Corner General Store	Findlay	OH	45839
High-Tech	Findlay	OH	45840
Jeannie Phone Co.	Findlay	OH	45840
Newton Apple Farm	Findlay	OH	45840
UNITAB	Findlay	OH	45839
Ashe Aircraft	Maumee	OH	45750
Dawe & Son, co.	Maumee	OH	45750
Lost Horizons, inc.	Maumee	OH	45755
Traditional Craft	Maumee	OH	45755

Page Footer 1

Printout of CUSTREP1.FRX

This report contains simple expressions in the group headers and footers. You may want to define fields to calculate values in each group in the report. Defining calculated fields is described later in this chapter. Examples of calculated fields are included in the Reports chapter of the FoxPro *Developer's Guide*.

Nested Groups

Many times, you will want to define a report with more than one group. The Report Writer allows up to 20 levels of data grouping within a report.

An example of a report with nested groups is a report where all records with the same city are grouped together. These records are then grouped by state. A report with multiple levels of data grouping needs to be ordered on more than one field.

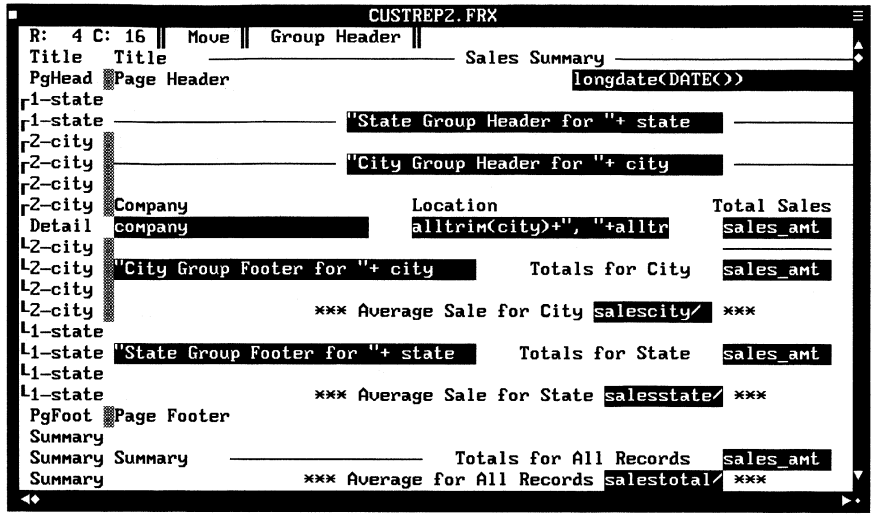
> The order in which the records are sorted or indexed is critical to a group report — all the records belonging to one group should be printed before records belonging to the next group.

Grouping data simply prints headers and footers each time a group value changes in the database. It does not order the records in the database. Sorting or indexing must be performed outside of the FoxPro Report Writer.

In this multiple group report, the database must be sorted or indexed on a key expression of STATE+CITY. The sample report used in this chapter is also ordered on COMPANY so that company names appear alphabetically within each group. The COMPANY index is for appearance only and is not necessary for grouping in this report.

Group bands must be defined for each level of data grouping, and objects must be defined in the bands to print the desired information.

The following picture shows the Report Layout window with multiple levels of data grouping.



Report Layout Window with CUSTREP2.FRX

In the sample report, group bands are printed:

- When the value of CITY changes. A group header and footer for the CITY group is printed.
- When the value of STATE changes, the value of CITY has also changed. Group bands are printed for the STATE group *and* group bands are printed for the CITY group.

The printed report on the following pages shows the data that is printed in each band of the report.

Title — Sales Summary

Page Header — Tuesday, July 23, 91

State Group Header For AL

City Group Header for Matusha

Company	Location			Total Sales	# Sold
Al's Liquor Emporium	Matusha,	AL	60626	916.54	10
Bolge Realty	Matusha,	AL	60626	965.80	22
KKT	Matusha,	AL	60630	702.26	44
Mercury Repairs	Matusha,	AL	60630	5,900.90	78
Stylistic Inc.	Matusha,	AL	60626	399.99	10
TRANCO	Matusha,	AL	60630	2.00	1
University of Yewe	Matusha,	AL	60630	965.25	19
City Group Footer for Matusha				Totals for City 9,852.74	184

*** Average Sale for City $53.55 ***

State Group Footer for AL — Totals for State 9,852.74 — 184

*** Average Sale for State $53.55 ***

State Group Header For CA

City Group Header for Burningsway

Company	Location			Total Sales	# Sold
Church of Hope	Burningsway,	CA	10786	88.80	1
Clemente Music Co.	Burningsway,	CA	10766	666.66	6
Forest Dry Cleaning	Burningsway,	CA	10766	1,023.64	10
L.H.H.F. of America	Burningsway,	CA	10786	2,276.44	13
MidWest Insurance	Burningsway,	CA	10766	711.55	12
City Group Footer for Burningsway				Totals for City 4,767.09	42

*** Average Sale for City $113.50 ***

City Group Header for San Rolfos

Company	Location			Total Sales	# Sold
Art Associates	San Rolfos,	CA	10514	1,500.00	40
Athletique Inc.	San Rolfos,	CA	10522	569.04	22
Beta Technologies	San Rolfos,	CA	10514	487.11	16
Cerkin Engineering	San Rolfos,	CA	10522	234.56	9
Daffodils Incorporated	San Rolfos,	CA	10514	632.97	4
DataTech Inc.	San Rolfos,	CA	10514	324.45	12
Traditional Toys	San Rolfos,	CA	10522	765.90	14
City Group Footer for San Rolfos				Totals for City 4,514.81	117

*** Average Sale for City $38.59 ***

City Group Header for Tipton

Company	Location			Total Sales	# Sold
Blenders R Us	Tipton,	CA	10920	999.99	8
Falk & Stein	Tipton,	CA	10920	5,678.65	31
Logan Saw Mill	Tipton,	CA	10944	43.90	2
Maloney Theatrical Co.	Tipton,	CA	10944	467.66	2
Redding Auto Service	Tipton,	CA	10944	546.98	16
City Group Footer for Tipton				Totals for City 7,737.18	59

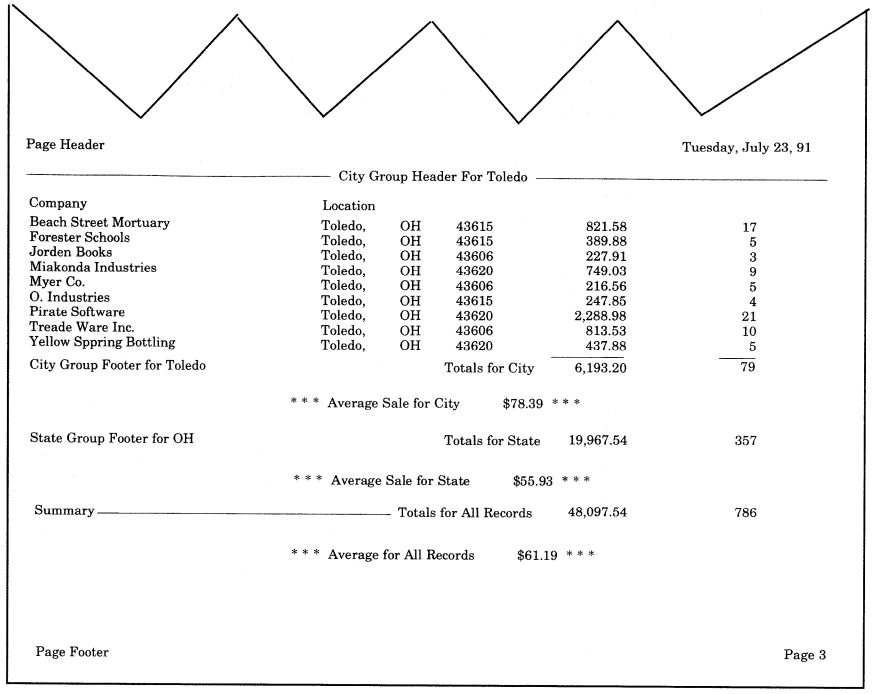
*** Average Sale for City $131.14 ***

State Group Footer for CA — Totals for State 17,019.18 — 218

*** Average Sale for State $78.07 ***

Page Footer — Page 1

Printed Output of CUSTREP2.FRX



Page Header Tuesday, July 23, 91

City Group Header For Toledo

Company	Location				
Beach Street Mortuary	Toledo,	OH	43615	821.58	17
Forester Schools	Toledo,	OH	43615	389.88	5
Jorden Books	Toledo,	OH	43606	227.91	3
Miakonda Industries	Toledo,	OH	43620	749.03	9
Myer Co.	Toledo,	OH	43606	216.56	5
O. Industries	Toledo,	OH	43615	247.85	4
Pirate Software	Toledo,	OH	43620	2,288.98	21
Treade Ware Inc.	Toledo,	OH	43606	813.53	10
Yellow Sppring Bottling	Toledo,	OH	43620	437.88	5
City Group Footer for Toledo			Totals for City	6,193.20	79

* * * Average Sale for City $78.39 * * *

State Group Footer for OH	Totals for State	19,967.54	357

* * * Average Sale for State $55.93 * * *

Summary	Totals for All Records	48,097.54	786

* * * Average for All Records $61.19 * * *

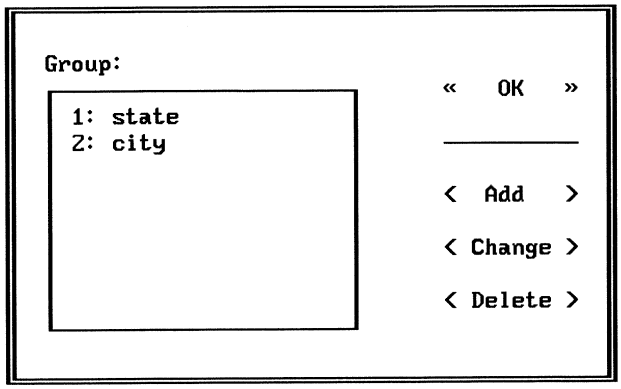
Page Footer Page 3

This report contains simple expressions in the group headers and calculated fields in the group footers. Report variables are used in group footers, also. Defining calculated fields and report variables is described later in this chapter. Hints for creating report variables are included in the FoxPro *Developer's Guide*.

Adding a Group Band

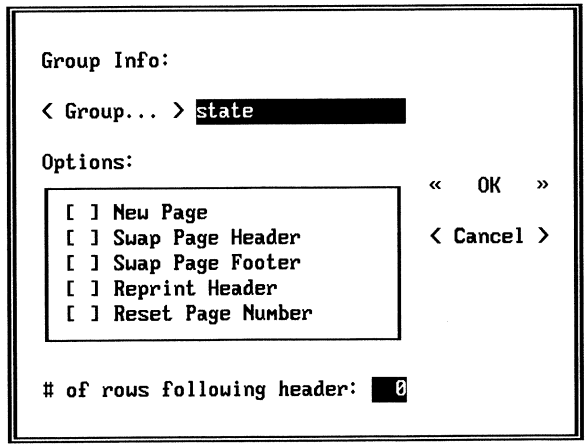
To add a group band:

1. Choose **Data Grouping...** from the **Report** menu popup to bring forward the Data Grouping dialog.



Data Grouping Dialog

2. Choose the **Add** push button. The Group Info dialog appears.



Group Info Dialog

3. Type the group expression in the text box to the right of the **Group...** push button, or choose the **Group...** push button to bring forward the Expression Builder. Create the group expression in the Expression Builder and choose **OK** to return to the Group Info dialog.

4. Choose the desired grouping options described in the Data Grouping Options section and the section titled Specifying Rows Following Group Headers.

5. Choose **OK** in the Group Info dialog to return to the Data Grouping dialog. The group expression is displayed in the Data Grouping list.

To add more groups, repeat this process. Groups are numbered in the Data Grouping list in the order in which they are created. In the Report Layout window, the names of the group bands contain the number of the group and a truncated group expression. The group headers and footers with the lowest number appears closest to the Detail band.

A group with a lower number is based on an expression whose value changes less often in a report than a group with a higher number. This means that a group with a higher number is a sub-group of a group with a lower number.

In the sample report (described earlier in this chapter), the value of STATE changed less often than that of CITY, which changed less often than ZIPCODE. STATE was group number 1, CITY was group number 2 and ZIPCODE was group number 3.

Data Grouping Options

At the bottom of the Group Info dialog there are five check boxes that you can choose. These check boxes perform the following actions:

New Page — When this option is checked, FoxPro executes a form feed when the value for the group expression changes. New groups will always begin on a new page.

Swap Page Header — When this option is checked, **New Page** is automatically checked. **Swap Page Header** executes a form feed to begin a group on a new page. The group header, (instead of the page header) appears at the top of the first page of the group. On all subsequent pages of the group, the page header appears. If you want to print the group header on subsequent pages of the group, use the **Reprint Header** option.

In order to use the **Swap Page Header** option, the page header and the group header to be "swapped" must be the same size (contain the same number of lines).

Swap Page Footer

When this option is checked, **New Page** is automatically checked. **Swap Page Footer** executes a form feed to begin a group on a new page. The group footer, (instead of the page footer) appears at the bottom of the last page of the group. On all preceding pages of the group, the page footer appears.

In order to use the **Swap Page Footer** option, the page footer and the group footer to be "swapped" must be the same size (contain the same number of lines).

Reprint Header

When a group spans more than one page, the group header follows the page header on all pages for the group. If **Swap Page Header** is checked, the group header is substituted for the page header only on the first page of the group.

Reset Page Number

When this option is checked, **New Page** is automatically selected as well. A form feed is executed and the page number is reset to 1 each time a group break occurs.

Specifying Rows Following Group Headers



The text box at the bottom of the Group Info dialog allows you to specify the number of rows that will follow the group header. If the number of blank rows at the bottom of the page (excluding the page footer) is less than the number specified with this option, the header is forced to the top of the next page. Use this feature to prevent your headers from being *orphaned* – standing alone at the bottom of a page and separated from information on the next page.

For example, if you would like at least five lines of detail information to follow a group header, you would enter 5 in the text box. When you run the report, if there are less than five lines remaining on a page when the group header is to be printed, the group header is forced to the next page.

Changing a Group Band

To change a group band, choose **Data Grouping...** from the **Report** menu popup, or double-click on the group band name in the left column of the Report Layout window. The Data Grouping dialog appears.

1. In the Data Grouping dialog, select the group expression in the **Data Grouping** list.
2. Choose **Change** to bring forward the Group Info dialog.
3. Use the same methods described in the section titled Adding a New Group to change an existing group.
4. Choose **OK** to return to the Data Grouping dialog.

Deleting a Group Band

To delete a group:

1. In the Data Grouping dialog, select the group expression in the **Data Grouping** list.
2. Choose the **Delete** push button.
3. Choose **OK**.

If objects exist in the group you wish to delete, an alert appears asking if you want to delete objects in the headers and footers. Choosing **Yes** deletes the group band and the objects it contains. Choosing **No** cancels the operation and returns you to the Data Grouping dialog.

Changing Grouping Order

You can change the order of groups in a report after they have been defined. A double-headed arrow appears to the left of group names in the Group dialog.

To change the order of a group with the keyboard, position the cursor on the group you would like to move, the press Ctrl+PgUp or Ctrl+PgDn to move the group. If your keyboard supports the use of arrow keys, you can press Ctrl+Up Arrow or Ctrl+Down Arrow to move the group.

To change the order of a group with the mouse, click on the double-headed arrow in the Group dialog, drag the group to a new location and release the mouse button.

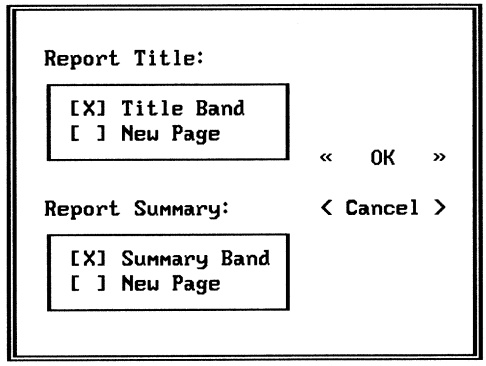
When groups are reordered, all objects defined in a group band are moved to the new location. Reordering groups does not change any previously defined objects.

If boxes or lines are anchored in a group band, they will remain anchored in that band when it is reordered.

Title/Summary...

Print title/summary for report

This option allows you to specify whether a title and/or summary band should be included in the report. Choose **Title/Summary...** and the Title/Summary dialog appears.



Title/Summary Dialog

When you specify that a **Title Band** and/or **Summary Band** should be included in the report, you can also specify whether or not the band should be printed on its own separate page(s). Check **New Page** to issue a page eject after the Title band information is printed or before the Summary band information is printed.

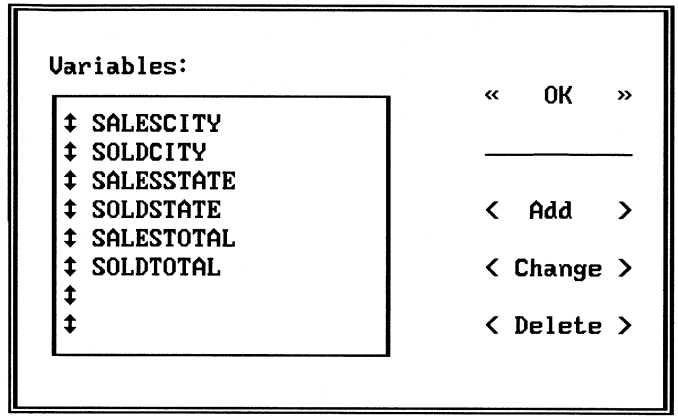
When the desired options are checked, choose **OK** in the **Title/Summary...** dialog to return to the Report Layout window.

To modify the settings for a Title or Summary band, choose **Title/Summary...** from the **Report** menu popup or double-click on the Title or Summary band name in the left column of the Report Layout window. The Title/Summary dialog appears.

Variables...

Define memory variables for the report

Choose **Variables...** to display the Report Variables dialog so you can create memory variables within a report. Memory variables may be used to store the results of calculations performed while the report is being printed. Once the report memory variable is created, it can be used as a field in the report or as part of an expression that performs further calculations.

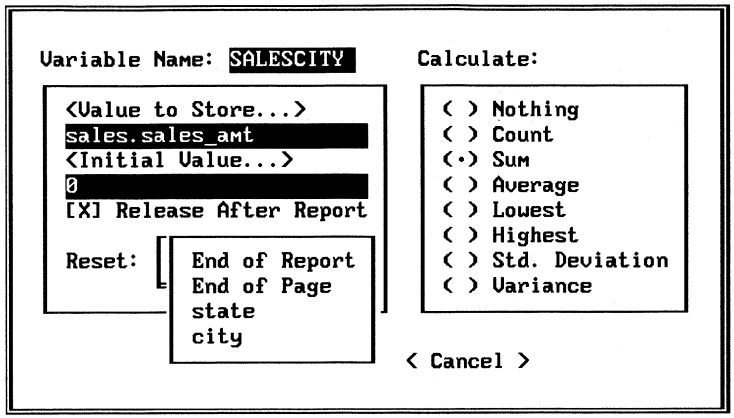


Report Variables Dialog

In this dialog you can add new variables, change or delete existing variables, or change the order in which the variables are evaluated.

Creating a New Report Variable

Choose the **Add** push button in the Report Variables dialog to bring forward the Variable Definition dialog.



Variable Definition Dialog

In the Variable Name text box, enter a name for the variable in this text box. Variable names can be up to 10 characters long. The name must begin with a letter or underscore, and can contain only letters, numbers or underscore characters.

Storing a Value to the Variable

Next, you must enter a value that will be stored to the memory variable. Enter a value in the text box below the **Value to Store...** push button or choose the **Value to Store...** push button to bring forward the Expression Builder so you can create an expression that will be stored to the variable.

Assigning an Initial Value to the Variable

You must assign an initial value to the variable in the Variable Definition dialog. The initial value is the value of the variable before any calculations are performed, and the value to which the variable is reset. Resetting the variable is described later.

By default, a value of 0 (zero) is displayed in the text box below the **Initial Value...** push button. You may enter a new value, or choose the **Initial Value...** push button to bring forward the Expression Builder so you can create an expression for the initial value.

Releasing a Variable After the Report

Check the **Release After Report** check box to release the report variable from memory after the report is printed. If this box is not checked, after you print the report the variable remains available in memory until you exit FoxPro or release the variable with the CLEAR ALL or CLEAR MEMORY commands.

Resetting the Variable

The **Reset** popup allows you to specify the point at which the variable is reset to its initial value. By default **End of Report** is displayed on the popup control, and **End of Page** is an option on the **Reset** popup.

If you have used the **Data Grouping...** option to create groups in a report, an option is displayed for each group in the report.

Specifying a Calculation for the Variable

On the right side of the Variable Definition dialog are radio buttons that allow you to specify a calculation that the variable is to perform. The variable will begin calculating with its initial value, and continue the operation until it is reset to this initial value. Storing the initial value and resetting the variable are described earlier in this section.

Report variables can perform one of the following calculations depending on the radio button you choose.

Nothing No computations will be made on this variable.

Count Counts the number of times a variable exists per group, page or report (depending on when the variable is reset). When **Count** is selected, the calculation is based on the number of times the variable occurs, not on the value of the variable.

Sum Computes the additive sum of the values of the variable. This option keeps a running total of the variable values for a group, page or report (depending on when the variable is reset).

Average Computes the arithmetic mean (average) of the variable values within a group, page or report (depending on when the variable is reset).

Lowest Causes the lowest value that occurred in that variable for a group, page or report to be displayed. The value of the first record in the group is placed in this variable, and when a lower value is encountered, the value in this variable changes accordingly.

Highest This is the same as **Lowest** except it keeps track of and changes with the highest value for the variable.

Std. Deviation Returns the square root of the variance for the variable values within a group, page or report (depending on when the variable is reset).

Variance This is a statistical calculation that measures the degree to which an individual field value varies from the average of all the values in the group, column, page or report (depending on when the variable is reset).

After defining the variable, choose **OK** in the Variable Definition dialog to return to the primary dialog. The name of the variable is displayed in the **Variables** list.

To create more report variables, choose the **Add** push button and repeat the process.

Changing Report Variables

To change a report variable, select the variable from the list in the Report Variables dialog, then choose the **Change** push button. The Variable Definition dialog appears. All previously defined information for the variable is displayed in the dialog.

Use the same procedures you use to create a new variable to change any of the characteristics of an existing variable. When you are finished, choose **OK** to return to the Report Variables dialog.

Deleting a Report Variable

To delete a variable, select the variable from the list in the Report Variables dialog, then choose the **Delete** push button.

Changing the Order of Variables



The order that variables are displayed in the Variables list can affect your output. Variables are evaluated in the order they appear in the list.

If one variable is used to define the value of another variable, the first variable must be placed in a position so that it is evaluated prior to the variable in which it is used as part of the defined value.

Example:

```
Variable AAA = field1 + field2
Variable BBB = AAA / 2
```

Variable AAA is used to define the value of variable BBB. Variable AAA must be evaluated prior to variable BBB and, therefore, variable AAA must precede variable BBB in the list in the Report Variables dialog.

To change the order of variables in the **Variables** list with the keyboard:

1. Press Tab until the first variable in the **Variables** list is highlighted.
2. Press the Down Arrow key until the variable you wish to move is highlighted.
3. Press Ctrl+PgUp to move the variable up in the **Variables** list. Press Ctrl+PgDn to move the variable down in the **Variables** list.

If your keyboard supports the use of Ctrl+Arrow key combinations, you can press Ctrl+Up Arrow to move a variable up in the list and Ctrl+Down Arrow to move a variable down in the list.

To change the order of variables in the **Variables** list with the mouse:

1. Click on the double-headed arrow to the left of the desired variable.
2. Drag the variable to the desired location in the **Variables** list.

When the variables are in the desired order in the **Variables** list, choose **OK** to return to the Report Layout window. When you save the report, variable definitions are saved in corresponding fields in the .FRX database.

Using Report Variables

You can use report variables as fields in the report or in expressions that define other fields. When you define fields for the report, report variables are displayed in the **Variables** list in the Expression Builder.

Defining fields for reports is described later in this chapter.

Box

Draw lines and boxes

Box allows you to place a box or line anywhere in the Report Layout window. Boxes and lines can improve the look and readability of a report and bring attention to a particular area of the report.

To place a box in the Report Layout window:

1. Position the cursor in the Report Layout window where you would like the box to appear.
2. Choose **Box** from the **Report** menu popup. A box, two columns wide by two rows deep, appears in the Report Layout window. The box blinks to show that is immediately available for sizing.

To size a new box with the keyboard, press the Right and Down Arrow keys to stretch the box to the desired size, then press Enter to confirm the action. Only the right and bottom borders of the box stretch during sizing. When the box is the desired size, you can select the box and move it to a new location.

To size a box with the mouse, click on the box and drag until the box is the desired size. Release the mouse button. Only the right and bottom borders of the box stretch during sizing. When the box is the desired size, you can select the box and move it to a new location.

Drawing a Line

Drawing a line in the FoxPro Report Writer is similar to drawing a box except you move the cursor or mouse in one direction only.

1. Position the cursor in the Report Layout window in the location you would like the box to appear.
2. Choose **Box** from the **Report** menu popup. A box, two columns wide by two rows deep, appears in the Report Layout window. The box will blink to show that is immediately available for sizing.

With the keyboard, use the arrow keys to shrink the box so that it has no width or depth. Press the Right Arrow key to draw a horizontal line, or press the Down Arrow key to draw a vertical line. You can only draw horizontal and vertical lines. Using a combination of Down and Right Arrow keys will cause a box to be drawn. Press Enter to confirm the action.

With a mouse, click on the box and drag until the box has no depth and the line is the desired length. You can only draw horizontal and vertical lines. Dragging the mouse diagonally will cause a box to be drawn.

Manipulating Boxes and Lines

Once a box is placed in the Report Layout window, you can select it, move it, resize it and delete it.

Selecting a Box or Line

To select a box with the keyboard, position the cursor on the border of the box and press the Spacebar. The box is highlighted to show that it is selected.

To select a box with the mouse, click on the border of the box. The box is highlighted to show that it is selected.

Moving a Box or Line

To move a box with the keyboard, position the cursor anywhere on the border of the box and press the Spacebar to select it. Use the arrow keys to move the box to the desired location. When the box is relocated, press Enter to deselect it.

With the mouse, point to the frame of the box, then click and drag it to the desired location. When the box is relocated, release the mouse button and press Enter or click anywhere outside the box to deselect it.

Resizing a Box or Line

To resize a box with the keyboard, position the cursor anywhere on the frame of the box and press Ctrl+Spacebar. The box blinks to show that it is selected for sizing. Use the Right and Down Arrow keys to size the box. Only the right and bottom edges will move. Press Enter when the box is the desired size.

To size a box with the mouse, point to the frame of the box and Ctrl+click. The box blinks to show that it is selected for sizing. Hold down the mouse button and drag the mouse to stretch or shrink the box. Release the mouse button when the box is the desired size.

Deleting Boxes and Lines

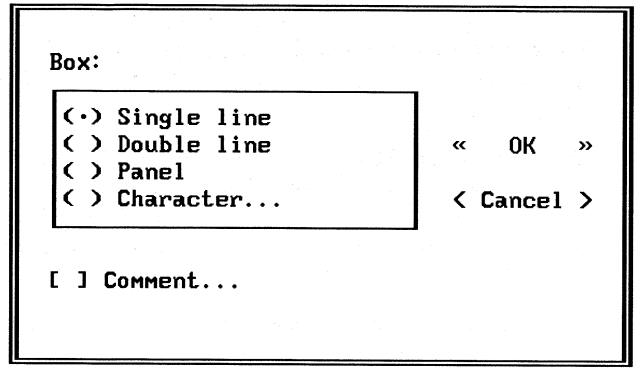
To delete a box or line, select it and press Backspace or Delete.

The Box Dialog

Options in the Box dialog allow you to specify a border, enter comments and "float" the selected box or line.

To display the Box dialog with the keyboard, position the cursor on the border of the box and press Enter.

With the mouse, double-click on the border of the box or line. The Box dialog appears.

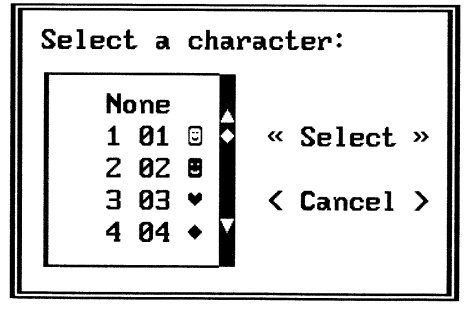


Box Dialog

Changing the Box Border

In this dialog you can specify whether you want a box with a single line border, a double line border, a panel border or a character border.

Choosing the **Character** radio button brings forward the Character dialog.



Character Dialog

Choose the desired character from the scrollable list, then choose the **Select** push button to return to the Box dialog.

Choose the appropriate radio button, then choose **OK**. The box appears in the Report Layout window with the specified border.

Choose the **Comment** check box to assign comments for the box. The **Comment** option is described earlier in this chapter.

Float as Band Stretches

If the entire box is in the Detail band of the report, a **Float as Band Stretches** check box appears in the Box dialog. If a portion of the box is positioned in another band, this check box is not available.

When **Float as Band Stretches** is checked, the box will stretch vertically as the band stretches to display field data. If it is not checked, the box will remain a fixed size. If a box is drawn around a field that will expand (a memo field, for example), **Float as Band Stretches** must be checked or the field data may overflow the box.

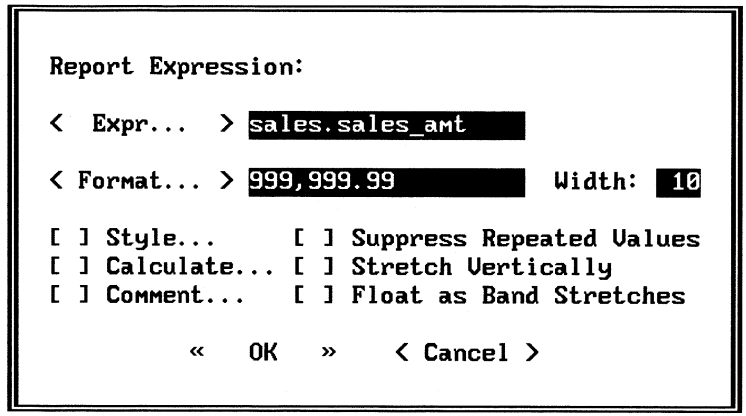
The **Float as Band Stretches** check box in the Box dialog causes a vertical line to stretch as deep as the band stretches to hold data. A horizontal line placed below a vertically stretched field will be printed on the line following the last line of data in the field. The **Stretch Vertically** option is described in the later in this chapter. If **Float as Band Stretches** is not checked, the line will be a fixed length in a fixed position.

Field...

Place fields in a report

Your report may include database fields, calculated values, calculated fields, user-defined functions or other output expressions.

To place a field in a report, position the cursor in the Report Layout window where you want the field to appear. Choose **Field...** from the **Report** menu popup. The Report Expression dialog appears.



Report Expression Dialog

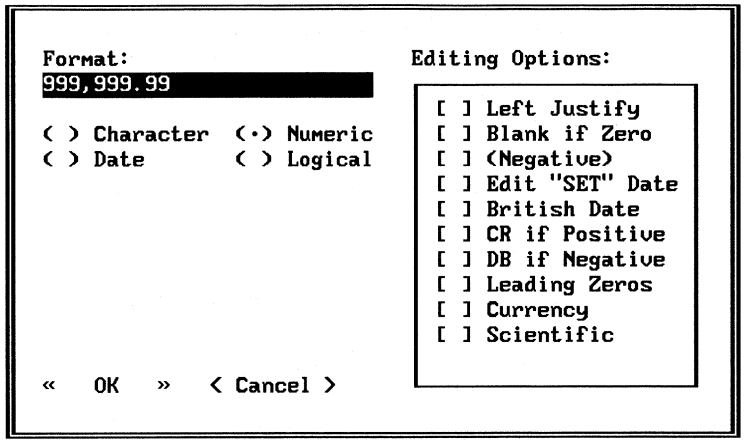
Type an expression in the text box next to the **Expr...** text button, or choose the **Expr...** push button to bring forward the Expression Builder dialog.

To add an alias to *all* fields defined in a report, check the **Add Alias** check box in the Page Layout Options dialog. You can specify when to add an alias to a report field in the Expression Builder Preferences dialog. For more information, see the section on Expression Builder Preferences in the File Menu chapter of this manual.

In the Expression Builder you can build an expression and **Verify** that it is correct before continuing. The Expression Builder is described in the File Menu chapter of this manual.

Formatting Fields

When a valid expression is displayed to the right of the **Expr...** push button, you can choose **Format...** to display the Format dialog so you can specify the format for the field in your report.



Format Dialog

A format may be specified for any output field. The format controls how the field is displayed when the report is printed. The Report Writer allows you to use the same picture template and formatting functions that are allowed in @ ... SAY output. These formatting commands, in conjunction with other data manipulation functions, let you design your output data in many ways.

Typical formatting of field data might include converting all alphabetical output to upper-case, inserting commas or decimal points in numeric output, or converting the American date format (mm/dd/yy) to British format (dd/mm/yy).

Editing Options

The Format dialog displays editing options that are available for Character, Numeric, Date and Logical field types, or you can create a format template by entering characters in the Format text box. The formatting options available for each type of database field are listed in the tables on the following pages.

Character Data Formatting Options	
Option	**Output**
Alpha Only	Only alphabetic characters allowed.
To Upper Case	All characters are converted to upper-case.
R	Non-format characters are displayed but not stored.
Edit "SET" Date	Edit data as a date using the current SET DATE format.
British Date	Edit data as a European (BRITISH) date.
Trim	Remove all leading and trailing blank spaces.
Right Align	Data is printed flush right in field.
Center	Data is centered in field.

Numeric Data Formatting Options	
Option	**Output**
Left Justify	All numeric data for the specified field will begin at the leftmost position in the field.
Blank if Zero	If the field output is zero, the zero will not be printed.
(Negative)	Negative numbers will be placed in parentheses.
Edit "SET" Date	Edit data as a date using the current SET DATE format.
British Date	Edit data as a European (BRITISH) date.
CR if Positive	CR (credit) will appear after the number if the number is positive.

Numeric Data Formatting Options	
Option	**Output**
DB if Negative	DB (debit) will appear after the number if the number is negative.
Leading Zeros	Prints all leading zeros.
Currency	Displays currency format (as specified in the Misc panel of the View window or with the SET CURRENCY command).
Scientific	Displays in scientific notation (useful for very large or very small numbers).

Date Data Formatting Options	
Option	**Output**
Edit "SET" Date	Edit data as a date using the current SET DATE format.
British Date	Edit data as a European (BRITISH) date.

Logical Data Formatting Options
No editing options are available when you choose **Logical** in the Format dialog.

Format Template

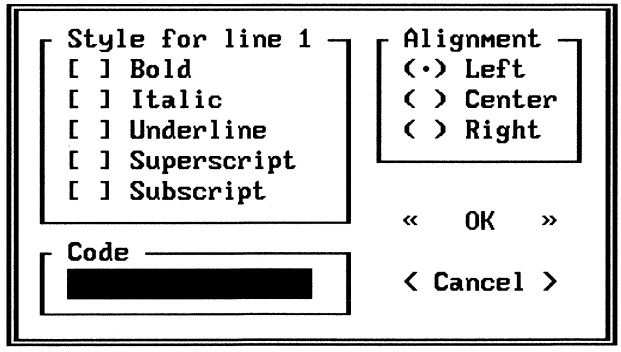
A Format template (the characters entered in the Format text box) may include any desired characters. However, only the characters that are listed below actively participate in formatting output. If any characters other than those listed below are entered in the Format template, they will be displayed on output.

Code	Output
A	Displays only alphabetic characters.
L	Displays logical data only.
N	Displays letters and digits only.
X	Displays any character.
9	Displays digits only for character data. Displays digits and signs for numeric data.
#	Displays digits, blanks and signs.
$	Displays fixed dollar sign in front of the numeric value.
$$	Displays floating dollar sign in front of the numeric value.
*	Displays asterisks in front of the numeric value. This function may be used in combination with a $ for check protection.
.	Specifies decimal point position.
,	Separates digits left of the decimal point.

Code	Output
@;	Forces a line feed in an expression in the Detail band of a report. When you create the expression, include a semicolon enclosed in quotation marks where you want the line feed to occur. @; must be entered in the text box next to **Format...** in the Report Expression dialog. Here's an example expression: `FIRSTNAME+";"+LASTNAME` The output from this expression is displayed with FIRSTNAME on the line directly above LASTNAME.

Changing Style

If you check the **Style...** check box in the Report Expression dialog, the Style dialog appears.



Style Dialog

Selections made in the Style dialog cause the printed output to appear with the specified Style attributes. When you check an option in this dialog, the associated Style code appears in the text box at the bottom of the Style dialog and will be applied to the object when you print the report.

You may check more than one check box in this dialog. If an option is checked that excludes another option, then the excluded option is dimmed.

Alternately, you may type style codes in the Style Code text box at the bottom of the dialog. If your printer driver supports style codes other than those available with FoxPro printer drivers, you can enter these style codes in the text box.

The alignment radio buttons are used with non-proportional fonts and allow you to specify the alignment of text within a field. The radio buttons are:

Left Text is left justified in the defined width of the field.

Center Text is centered in the defined width of the field.

Right Text is right justified in the defined width of the field.



Selected styles appear in printed output only. The specified style does *not* appear in the Report Layout window or in the Page Preview window.

In order for selected styles to appear in printed output, your printer must support the specified styles.

Computed Fields

Choose **Calculate...** in the Report Expression dialog to display the Calculate Field dialog.

Here, you select a mathematical operation to create a computed field. Radio buttons in the Calculate Field dialog include:

Nothing No computations will be made on this field.

Count Counts the number of times a report field is printed per group, page or report, depending on the Reset selection (see below). When you check **Count**, the calculation is based on the number of times the field occurs or appears, not on the field values.

Sum Computes the additive sum of the values of the field. This option keeps a running total of the field values for a group, page or report.

Average Computes the arithmetic mean (average) of the field values within a group, page or report.

Lowest Displays the lowest value that occurred in that field for a group, page or report. The value of the first record in the group is placed in this field. When a lower value is encountered, the value in this field changes accordingly.

Highest Works the same as **Lowest** except that **Highest** keeps track of and changes with the highest value for the field.

Std. Deviation Returns the square root of the variance (see below) for the variable values within a group, page or report (depending on when the variable is reset).

Variance This is a statistical calculation that measures the degree to which an individual field value varies from the average of all the values in the group, column, page or report (depending on when the variable is reset).

At the top of the Calculate Field dialog is a **Reset** popup control. Choose this control to display the **Reset** popup.

With this popup, you can select the point at which the calculate operation for this field will be set to zero.

End of Report The field is calculated at the end of the report without being reset.

End of Page The field is calculated and then reset to zero at the bottom of each page.

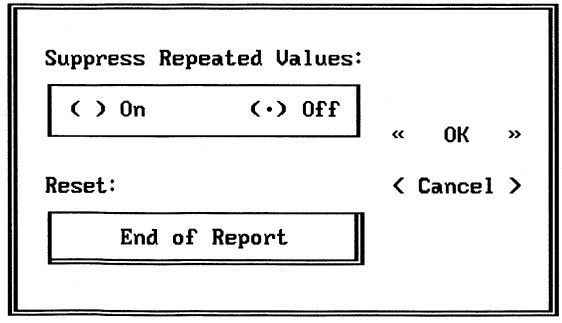
If you used the **Data Grouping...** option, you see that each control break expression is also shown on this menu, allowing you to reset the calculated field with any group.

Specify Field Width

The Width text box always appears in the Report Expression dialog. The default width is the width of the expression that is in the text box next to the **Expr...** push button. To change the width, select the default value and type in the desired width.

Suppress Repeated Values

Choosing this check box brings forward the Suppress Repeated Values dialog. This dialog contains two radio buttons, **On** and **Off**. **Off** is selected by default and repeated values in a report are displayed. Choosing **On** suppresses repeated vaules. If a value is the same for more than one consecutive field, the value is displayed for the first record but does not appear for the next records.



Suppress Repeated Values Dialog

The **Reset** menu popup in this dialog allows you to specify when to print a repeated value. **End of Page** and **End of Report** are displayed by default in this menu popup. If any group bands are defined, the group expressions are displayed in this menu popup.

Stretch Vertically

This check box only appears in the Report Expression dialog when the selected field is located in a Page Header band or a Detail band.

The band in which a field or expression is placed will stretch (vertically) to hold all the data in that field. If this check box is not checked, the band remains the fixed size. Any data from a field that does not fit in the allotted space is cut off.

Float as Band Stretches

This check box only appears in the Report Expression dialog when the field is located in the Page Header band or Detail band.

Checking this check box causes the field to be printed in the specified column, but on the line following the last line of data in a vertically stretched field. **Stretch Vertically** is described above.

In order for the field to float, it must be placed on a line in the Report Layout window *below* the first line of the vertically stretched field it will follow. This holds true even if the field is next to a vertically stretched field (as opposed to directly below it). If the field is placed above or on the same line as the vertically stretched field, it will appear in its fixed place in the report.

Use this option to prevent the field from being printed too soon and obscuring other fields (that have stretched vertically), or being printed too late and leaving large gaps in the report.

Exiting the Report Expression Dialog

When you have made the desired selections and/or entered the desired values in the appropriate areas of the Report Expression dialog, choose **OK** to confirm the selections.

You can leave the dialog without making any changes by choosing **Cancel** or pressing Escape.

When you return to the Report Layout window you will see your expression (or part of it) displayed in the Report Layout window. Fields can be sized and moved as desired.

Moving and Sizing Fields

Before you move a field, you must select it. Use the arrow keys or drag it with the mouse to any location in any band in the Report Layout window. Release the mouse button or press Enter when the field is correctly positioned.

To size a field with the keyboard, place the cursor anywhere in the field and press Ctrl+Spacebar. Use the Left/Right Arrow keys to make the field longer or shorter. Press Enter when the field is the desired size.

To size a field with the mouse, point to the field and Ctrl+click. While still holding down the Control key, drag left or right until the field is the desired size, then release the mouse button.

Text

Edit and format text objects

Text can be used for field labels, page headers, report titles and other instances where words are required to make the report easier to read and understand. Text appears in the report exactly as it is typed. Text is treated as an object, which means that a portion of text that you enter (for example, a word, a phrase, or an entire line) is treated as a single unit. As an object, it can be selected, moved, stacked or deleted.

Creating Text

To create text, position the cursor in the Report Layout window where you want the text to appear. Type the text and press Enter. Once you type the text and press Enter or reach the end of the line the cursor is on, the text becomes an object.

Selecting Text

Before a text object can be manipulated (moved, deleted, etc.), it must first be selected. A text object is selected just like other objects — by placing the cursor on it and pressing the Spacebar, or clicking on it with the mouse. Remember, a text object includes all text that is typed until you press Enter or until the end of the line is reached. When text is selected it can be moved with the arrow keys or the mouse just like any other object.

Editing Text

To edit a text object, move the cursor or pointer to the desired text. Ctrl+click with the mouse or choose **Text** from the **Report** menu popup. The text is no longer treated as an object. Use FoxPro text editing techniques to make the desired changes. Press Enter when you are done editing to make the text an object.

Text Dialog

To determine options for text objects, choose a text object by double-clicking on it with the mouse or placing the cursor on it and pressing Enter. The Text dialog appears.



Text Dialog

This dialog has three check boxes: **Style...**, **Comment...** and **Float as Band Stretches**.

Style...

Check the **Style...** check box to display the Style dialog. This dialog is described in the Field section earlier in this chapter.

Comment...

Comments can be assigned to all objects in the Report Layout window. Assigning comments to objects is described in the Creating Objects section of this chapter.

Float as Band Stretches

This check box only appears in the Text dialog when the text object is located in the Page Header band, Detail band or Page Footer band.

Float as Band Stretches works with text objects just as it does with field objects. When you check this option the text is printed in the specified column on the line that follows the last line of data in a vertically stretched field. The **Stretch Vertically** check box is described earlier in this chapter.

For a text object to float, it must be placed on a line in the Layout window *below* the first line of the vertically stretched field it will follow. This holds true even if the text object is next to a vertically stretched field (as opposed to directly below it). If the text object is placed above or on the same line as the vertically stretched field, it will appear in its fixed place in the report.

If **Float as Band Stretches** is checked for several text objects, they will all float below the vertically stretched field and be printed in the specified column relative to their original placement.

Deleting Objects

To remove an object from the report, select the object and press Backspace or Delete, or choose **Clear** or **Cut** from the **Edit** menu popup.

Cutting and Pasting Objects

Choosing **Cut** from the **Edit** menu popup after you select an object places the deleted object on the clipboard. You can then **Paste** the object back into the current Report Layout window or any other Report Layout window. The object that has been **Cut** remains on the clipboard until you **Cut** or **Copy** another object, or until you exit FoxPro. The **Cut** and **Paste** options work with all the FoxPro Report Writer objects (boxes, lines, fields, etc.). These options are disabled unless an object has been selected in the Report Layout window.

Revert

Revert on the **File** menu popup can be used in the FoxPro Report Writer just as it is in text editing regions. When a Report Layout window is frontmost, choose **Revert** and an alert appears asking if you want to discard changes. Choose **Yes** to discard all changes made after you last saved the report and return you to the previously saved Report Layout window. Choose **No** to return to the Report Layout window without discarding changes.

Add Line/Remove Line

Add/Remove lines from report definition

Use these **Report** menu options to change the size of any band. Place the cursor in the band that you want to resize and choose **Add Line** or **Remove Line** as many times as needed to make the band the desired size.

When you choose **Add Line**, the new line is added before the line where the cursor is positioned, and the cursor is placed in the new line.

Press Shift when you display the **Report** menu popup to change the **Add Line** option to **Add Line After**. **Add Line After** inserts the new line after the cursor.

Remove Line deletes the line in which the cursor is presently positioned. If there is an object on the line, an alert appears asking for confirmation.

Choose **Yes** to delete the line and the object. **No** returns you to the Report Layout window without making any changes.

Bring to Front/Send to Back

Change stacking order of objects

These two options allow you to look at overlapping expressions, text, lines and boxes, and change the order (front to back) in which they appear on your screen and in the printed report. You might draw a box over a line of text, but want the text to be displayed on top of the line. Use these options to put the objects in the desired stacking order.

Center

Center objects

Center moves an object in the Report Layout window to the center of the line on which it appears. The page size affects this centering and is defined in the Page Layout dialog described earlier in this chapter.

Select the object that you want to center and choose **Center** from the **Report** menu popup. The selected object is automatically moved to the center of the line on which it is located.

If you select multiple objects and choose **Center**, all the selected objects will be centered relative to the width of the report. If multiple objects are selected in the same row of the report, the objects will center and lay on top of one another.

If you would like to center multiple objects in the same row, but keep their spacing in relation to each other, you must first group the objects. When you group multiple objects, they then act as one object. When you choose **Center** to center a grouped object, the grouped object is centered on the specified row in the report.

In order to center field data on the page, you must select the **Center** formatting option in the Format dialog as well as choosing **Center** from the **Report** menu popup.

Group and Ungroup

Combine multiple objects into one object



These two options allow you to take a collection of individual objects and create a single object, or to take a grouped object and divide it back into its individual pieces. This is a convenient option that allows you to manipulate a complex collection of objects as a single object. The objects that make up the group retain their stacking order in relation to each other. The group as a whole becomes the frontmost object in the Report Layout window.

Select the objects you would like to group and choose **Group** from the **Report** menu popup. A grouped object can then become part of another group.

To ungroup an object, select the grouped object and choose **Ungroup** from the **Report** menu popup.

Objects that are part of a group cannot be edited or modified. In order to edit or modify objects, you must first ungroup them.

Group Boxes

If two or more boxes overlap in a report, you can join the boxes so that the lines are joined where the boxes intersect. This gives reports a clean, crisp appearance.

To join boxes in reports:

1. Select the boxes you wish to join in the Report Layout window. When two or more boxes are selected, the **Group** option on the **Report** menu popup changes to **Group Boxes.**
2. Choose **Group Boxes** on the **Report** menu popup. The boxes are grouped and the lines are joined.

If boxes are selected with other objects (not boxes), they can be grouped, but the lines will not be joined. To enable the **Group Boxes** option, only boxes can be selected.

If you would like to group overlapping boxes, but *not* join the lines:

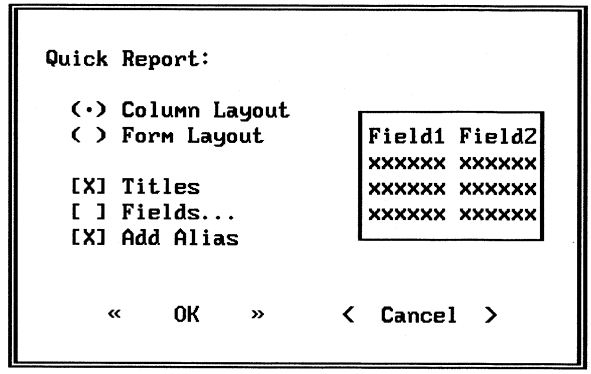
1. Select the boxes you want to group in the Report Layout window.
2. Hold down the Shift key when you choose the **Report** menu pad. The **Group** option will not change to **Group Boxes** when the Shift key is depressed. Boxes are grouped and act as one object, but the lines are not joined.

Quick Report...

Automatically places selected fields in Report Layout window

Quick Report... is the last option on the **Report** menu popup.

Quick Report... automatically places selected fields in the Report Layout window. **Quick Report...** is only available when the Detail band of the Report Layout window is empty. All *you* need to do is position them and insert text or graphics to finish creating the report. Choose **Quick Report...** to bring forward the Quick Report dialog.



Quick Report Dialog

Quick Report offers two field placement options — **Column Layout** and **Form Layout**. Choose **Column Layout** to display the fields from left to right across the page in the Detail band. If there are more fields than you have room for in the Report Layout window, the Report Writer resizes fields to display as many fields as possible across the page. This resizing does not affect the size of the field as defined in the database.

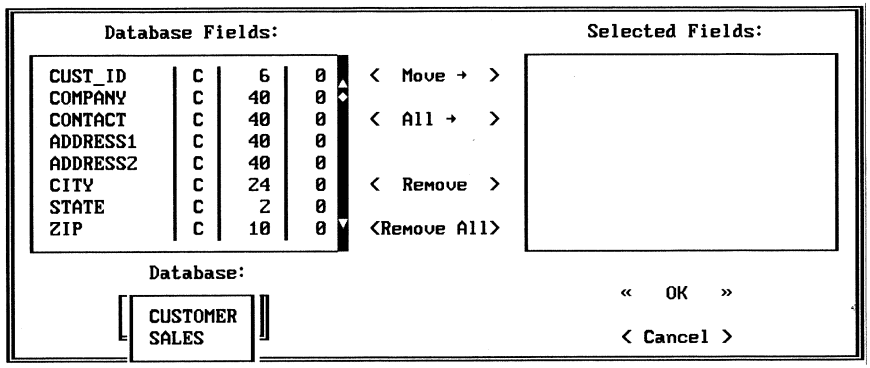
Choose **Form Layout** to display the fields one below the other in the Detail band. In this case, the Detail band will stretch to accommodate all fields selected for display.

The **Titles** check box determines whether or not field names will be displayed as titles above or next to the corresponding field.

- If you choose the **Column Layout** format, the field names are displayed in the Page Header band above the corresponding fields. If there are other objects in the Page Header band, no titles will be displayed.

- With **Form Layout**, the field name is displayed in the Detail band to the left of the corresponding field. The titles will be displayed in the Detail band even if there are objects in the Page Header or Footer.

When the **Fields...** check box is checked, the Field Picker dialog appears.



Field Picker Dialog

This is the same dialog you use when you want to display specific fields in the Browse window or when you specify a fields list for other commands. In this case, you use it to display specific fields in your report. The Field Picker dialog is described in the Database Menu chapter of this manual.

When the **Add Alias** check box is checked, the alias is automatically added to all field names in the Report Layout window.

Choose **OK** in the Quick Report dialog and the fields appear in the Report Layout window. Choosing **Cancel** exits the Quick Report dialog without taking action. Once the fields are displayed in the Layout window, you can select them with the mouse or with the keyboard as previously described. You can then size them and place them in any band in the Report Layout window. You can also specify style and/or format attributes, and add text and graphics to enhance your layout.

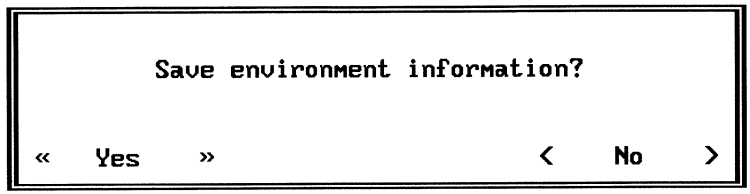
Date and Page Number

By default, Quick Report places a field with the DATE( ) function in the lower left corner of the Report Layout window, and a field with the _PAGENO system memory variable in the lower right corner of the Report Layout window. The _PAGENO system memory variable is preceded by the text "Page" in the Report Layout window. The current date and page number will be displayed in the printed report and in the Page Preview window. The date and page number fields can be manipulated like any object in the Report Layout window.

Saving Report Definitions

Save the report just as you save a screen, text or program file. Choose **Save** from the **File** menu popup and name the report. The .FRX extension is automatically added to the file name.

If you have not previously saved environment information using the options in the Page Layout dialog (as described earlier), an alert appears asking if you want to save the environment information.



Save Environment Alert

Choosing **Yes** saves the environment information in fields of the .FRX database on disk. Choosing **No** saves the report with no environment information.

Running Reports

To run reports created in the FoxPro Report Writer, choose **Report...** from the **Database** menu popup and select the report definition file that you want to use.

The Report dialog is described in the Database Menu chapter of this manual.

For those who prefer working through the Command window, the command for running reports is:

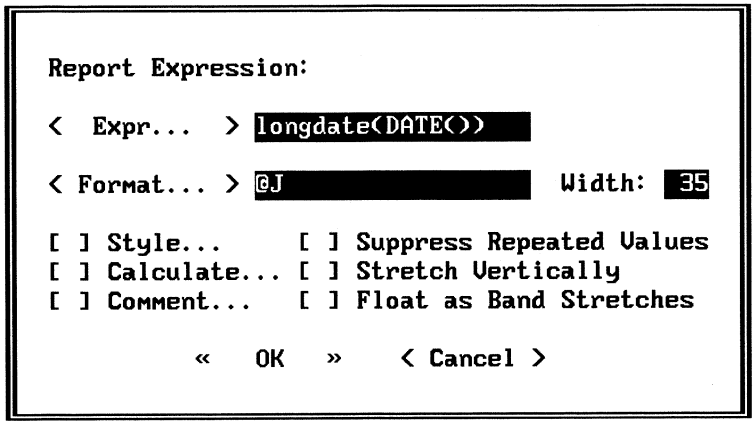
```
REPORT FORM <filename>
```

FoxPro then produces the appropriate output from the definition file.

Running a report never changes the data in the database, index or memo files, yet with the FoxPro Report Writer you can summarize your data in any way you wish.

User-Defined Functions in Reports

You can include user-defined functions (UDFs) in reports. Position the cursor in the Report Layout window where you want the UDF to appear. Choose **Field...** from the **Report** menu popup. The Report Expression dialog appears. Type the name of the UDF followed by a set of parentheses (and any optional arguments) in the text box next to **Expr...**. Enter a Width and choose **OK**.



Report Expression Dialog with Defined UDF

The value returned by the UDF will appear in your report output and in the Page Preview window.

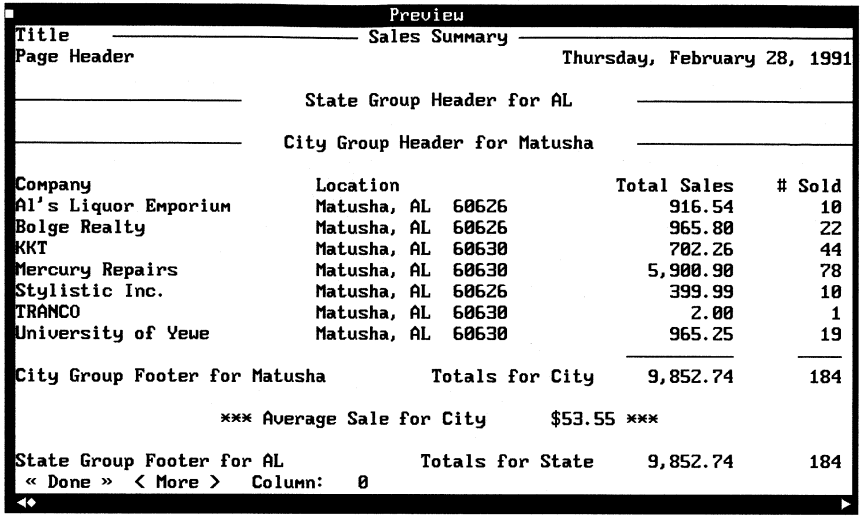
Before you choose **Page Preview...** or run a report that contains UDFs, be sure to set your path to the directory where the UDFs are located. Otherwise, you will receive the error message "File not found".

The Report Layout window pictured in this chapter contains a UDF called LONGDATE( ) which has DATE( ) as an argument. LONGDATE.PRG contains these lines:

```
*** LongDate ***
PARAMETERS mdate
RETURN CDOW(mdate)+', '+MDY(mdate)
```

When you choose **Page Preview...** or run the report, the system date is passed to the UDF and converted so that the day and month are written out.

Notice the date in the Page Preview window that follows.



Page Preview Window

Using Reports From Other Applications

Many users will have reports that were defined in an earlier version of FoxBASE+ or another compatible program. With the Report Writer, these files are easily converted and can be enhanced just like a report that was originally created with the FoxPro Report Writer. Report files that have been created with other applications will have an .FRM extension rather than the .FRX extension assigned to the FoxPro Report Writer files. If the files contain appropriate data, you can print these reports "as is".

When you choose **Report** from the **Type** popup in the Open File dialog or choose **Report...** from the **Database** menu and choose the **Form** push button, both .FRX and .FRM files are displayed. When you open an .FRM file, the FoxPro Report Writer converts it to a format that can be displayed in the Report Layout window.



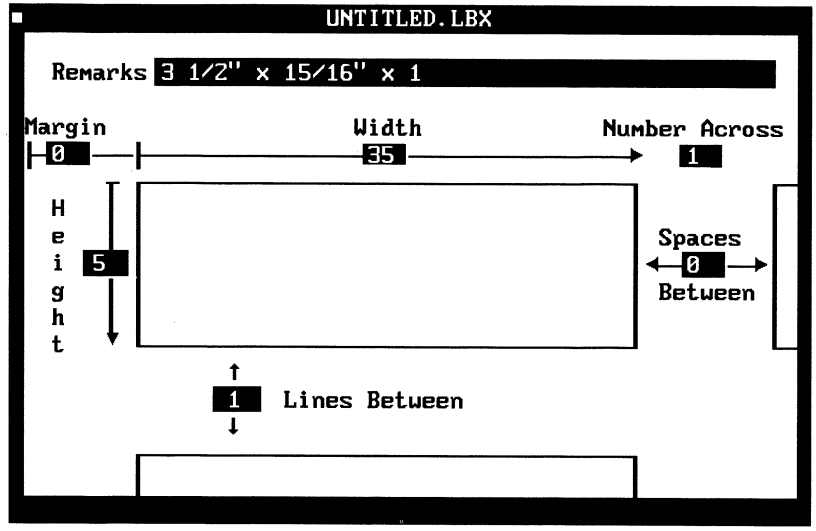
The Report Writer will only convert and allow you to modify FoxBASE+ or dBASE III PLUS® compatible .FRM files. dBASE IV® .FRM files *cannot* be modified in FoxPro.

Text and fields can then be manipulated like objects that were originally created with the FoxPro Report Writer. You can also add text, lines and boxes to enhance the report.

When you save the report, it is saved with the original name and extension. The Report Writer *does not* automatically convert .FRM files to .FRX files when saving. If you want the file saved with the .FRX extension, choose **Save as...** from the **File** menu popup and enter the desired file name with the new .FRX extension. You will now have two copies of the same report. If you like, you can delete the .FRM file.

16 Label Designer

To display an empty Label Layout window so you can create labels, choose **New...** from the **File** menu popup, then choose the **Label** radio button and choose **OK**.

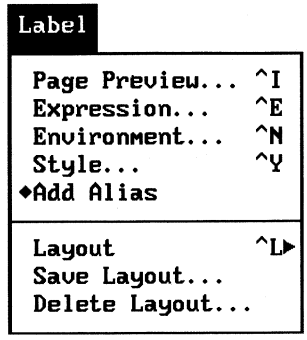


Label Layout Window

Because labels that you create pull their information from a database file, you must open the necessary database and index files and set the order for your labels. When you create and save a label file, an .LBX database is created. All information about the label's layout, content and environment is stored in fields in this database.

To modify an existing label file, choose **Open...** from the **File** menu popup. Make sure that **Label** appears on the **Type** popup control.

Select the label file that you want to modify from the list and choose **Open**, or double-click with the mouse or the Spacebar.



Label Menu

When a Label Layout window is frontmost, a **Label** menu pad is added to the menu bar. Each menu option on the **Label** menu popup is described in this chapter.

Determining a Layout

When you create labels, you must first determine a layout that is suited to your needs. You can choose a pre-defined layout, or you can design your own. Once you choose a layout, you can make decisions about the content of the labels.

The default layout for the Label Layout window is 3-1/2" x 15/16" x 1, meaning that the label size will be 3-1/2 inches wide by 15/16-inch high, and one column of labels will be on a page. You can use this layout, choose a new layout from the **Label** menu popup or design your own custom layout.

Several pre-defined layouts are provided with FoxPro. If you have labels on hand, measure them to see if one of the pre-defined sizes will fit your needs.

To use a pre-defined layout, choose **Layout** from the **Label** menu popup. Choose the desired layout from the additional popup that appears. The Label Layout window automatically changes to reflect the new settings.

Creating a Custom Layout

You can also create a custom layout for your labels in the Label Layout window. Position the cursor over an existing value that you want to change and type the desired value.

A custom label can be designed within the following guidelines:

Height — The height of a label can be from 1 to 255 lines.

Margin — The left margin can be from zero to 220 columns.

Width — The width can be from 1 to 255 spaces.

Number Across — You can have up to 120 labels across a page.

Spaces Between — You can have as many as 120 spaces between each label.

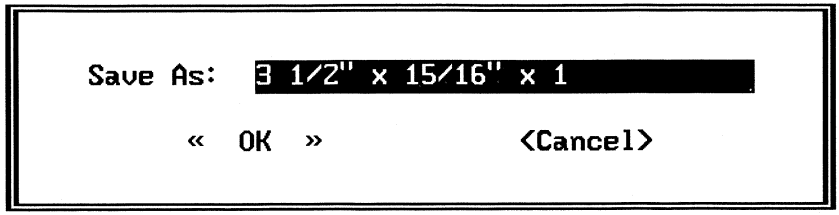
Lines Between — You can have from zero to 120 lines between each row of labels.

Remarks — You can type a brief note here, such as the dimensions or a description to help you identify the layout. These remarks appear on the **Layout** menu popup.

Make sure that when you add the dimensions together, the total number of lines and spaces does not exceed the length or width of your label forms, or the capabilities of your printer. For example, if you wanted to print 3-1/2" x 15/16" labels, and you wanted to print more than three labels across a page, you would need a 120-column printer.

Saving a Custom Layout

To save a custom label layout so it appears on the **Layout** popup along with other pre-defined layouts, choose **Save Layout...** from the **Label** menu popup. A Save Layout dialog appears.



Save Layout Dialog

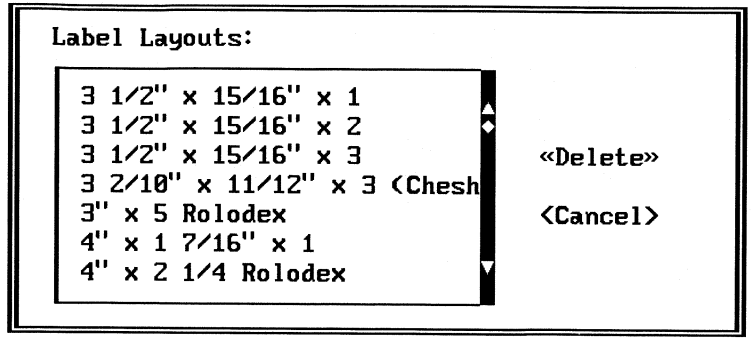
Notice that the contents of the **Remarks** text box appear in the text box in the Save Layout dialog. You can accept the default, or type something else in the text box to distinguish this layout from the others that already exist. Choose **OK** to save the layout.

If a layout already exists with the same name as the one you are saving, an alert appears to ask if you want to overwrite the existing layout.

Choose **Yes** if you want to replace the existing layout with the new layout. **No** returns you to the Save Layout dialog so you can rename the layout and choose **OK** to save it. **Cancel** returns you to the Label Layout window without taking action.

Deleting a Label Layout

To delete a label layout, choose **Delete Layout...** from the **Label** menu popup. A Delete Layout dialog appears.



Delete Layout Dialog

Select the layout that you want to delete, then choose **Delete**.

Defining Label Contents

A label can include database field information, calculated fields, computed fields and text. You can use the Expression Builder to build and verify each line in the label, or you can type expressions or text on each line of the text area in the Label Layout window.

Entering Text in Labels

To enter text in a label, place the cursor on the line in the label form where you want the text to appear. Type the text into the Label Layout window text box and surround the text with quotation marks.

Creating Expressions in Labels

To create an expression in the label with the Expression Builder, place the cursor on the line in the label where you want the information to appear. Choose **Expression...** from the **Label** menu popup. The Expression Builder appears.

Type in or choose any field names, variables, operators and functions that are available to build the expression. When **Add Alias** is chosen from the **Label** menu popup, FoxPro places an alias in front of expressions in the Expression Builder. A diamond precedes this option on the popup when **Add Alias** is on. If no databases are open, no fields appear in the **Field Names** list.

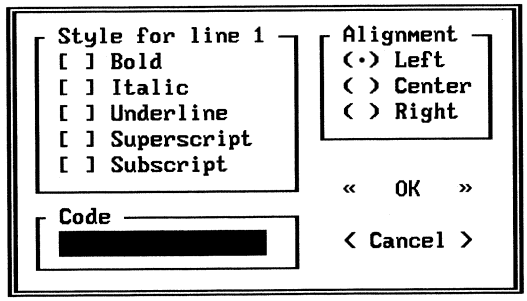
When you finish building the expression, choose **OK**. Repeat this process for each line in your label.

For example, if you want a label with a name on the first line, street address on the second line, and city, state and zip code on the third line, you should build three expressions — one for each line of the label.

It is not necessary to use the Expression Builder when you create labels. If you like, you can place the cursor on any line in the label form and type in the expression that you want to appear on that line of the label.

Adjusting Text Style in Labels

When you choose **Style...** from the **Label** menu popup, the Style dialog appears.



Style Dialog

Selections made in the Style dialog cause the printed output to appear with the specified Style attributes. When you check an option in this dialog, the associated Style code appears in the Code text box at the bottom of the Style dialog.

If you prefer, you can type the Style code in the text box at the bottom of the dialog. If your printer driver supports style codes other than those available with FoxPro printer drivers, you can enter these codes in the text box.

You can choose a different style for each line in your label. If you choose a style option that excludes another option, the excluded option is disabled.

Selected styles appear in printed output only. The specified style does not appear in the Label Layout window or in the Page Preview window.



> In order for selected styles to appear in printed output, your printer must support the specified styles.

Three radio buttons appear in the top right corner of the Style dialog for alignment. These radio buttons are used with non-proportional fonts and allow you to specify the alignment of text within a field. The radio buttons are:

Left Text is left justified in the defined width of the field.

Center Text is centered in the defined width of the field.

Right Text is right justified in the defined width of the field.

Removing Blank Lines from Labels

Blank lines can appear in your printed labels if an expression in the label definition evaluates to null. A common example is the presence of two address fields in a database, ADDRESS1 and ADDRESS2, where ADDRESS2 is sometimes empty.

Sample label definition:

```
COMPANY
ADDRESS1
ADDRESS2;
TRIM(CITY) + "," + STATE + " " + LTRIM(ZIP)
```

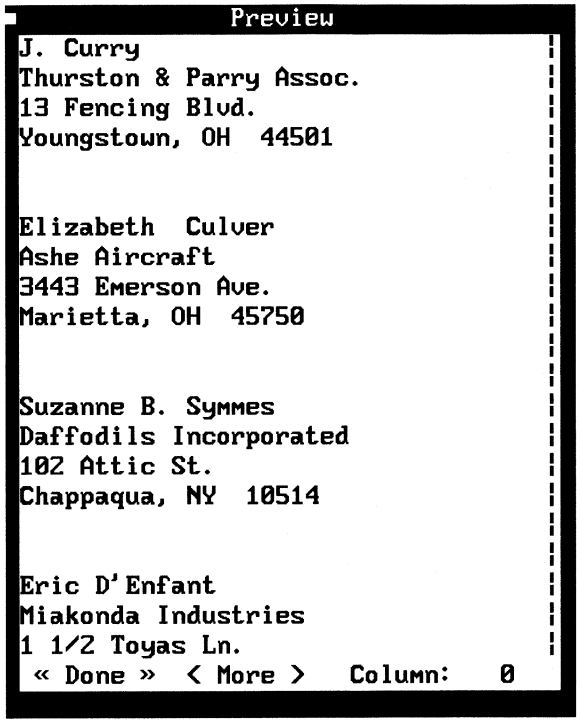
To prevent a blank line from printing in your label if certain customers don't have an ADDRESS2, place a semicolon after ADDRESS2 in the label definition. If ADDRESS2 (or any other expression followed by a semicolon) evaluates to null, that line is removed from the label and the remaining lines are moved up.

Trimming Fields in Labels

When you separate two fields in a label with a comma, FoxPro automatically removes trailing spaces from the preceding field and places a single space between it and the following field.

Previewing the Labels

After you define the contents of the label, you can choose **Page Preview...** from the **Label** menu popup to see how your labels will look before you print them. Choose **Page Preview...** to display the Page Preview window.



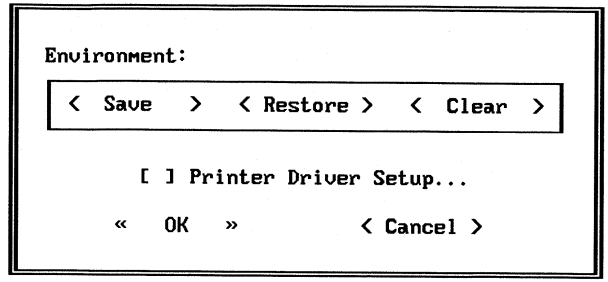
Page Preview Window

To scroll through the labels, choose the **More** push button. When you are ready to return to the Label Layout window, choose the **Done** push button.

If you have a multi-column layout or your labels are wider than the Page Preview window, a scroll bar appears at the bottom of the window. Use the scroll bar or press the Left/Right Arrow keys to see different portions of the page.

Saving Label Environment Information

When you choose **Environment...** from the **Label** menu popup, a Label Environment dialog appears.



Label Environment Dialog

The Label Environment dialog contains three push buttons: **Save**, **Restore** and **Clear**.

The following information about the environment can be saved with a label:

- Open database files in all work areas
- The selected work area
- Index order on any open database file
- Any relations that have been set
- Any 1-to-many condition that has been set
- Printer driver setup information

When creating a label, you usually have open databases, indexes, and relations settings that you will want to use whenever you modify or print the label. The **Save** push button in the Label Environment dialog is used to save this environment information in the .LBX database when the label is saved. Choosing the **Printer Driver Setup...** check box displays the Printer Driver Setup dialog. Refer to the Printer Driver Setup Dialog section in the File Menu chapter of this manual for more information.

Restoring Label Environment Information

If you have changed the environment by opening or closing databases, indexes, and so on while modifying a label, you can restore the environment information previously saved with the label by choosing the **Restore** push button in the Label Environment dialog. The **Restore** push button is disabled if there is no environment information saved for the label.

Clearing Label Environment Information

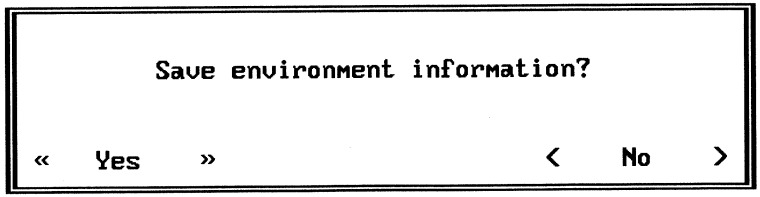
You can clear the environment information previously saved with the label by choosing the **Clear** button in the Label Environment dialog.

The **Clear** push button is disabled if there is no environment information saved for the label.

Saving the Label

Choose **Save** from the **File** menu popup to save the label. Any modifications to the label are saved on disk. The first time you save the label, you will be prompted to name the label file.

If you have not previously saved the environment information, an alert appears asking if you want to save the environment information now.



Choosing **Yes** saves the environment information in the corresponding fields of the .LBX database on disk. Choosing **No** saves the label without environment information.

Running Labels

To run labels created in the FoxPro Label Designer, choose **Label...** from the **Database** menu popup and select the label definition file that you want to use.

The Label dialog is described in the Database Menu chapter of this manual.

For those who prefer working through the Command window, the command for running labels is:

```
LABEL FORM <filename>
```

FoxPro then produces the appropriate output from the definition file.

Running a label never changes the data in the database, index or memo files.

.LBX Database Structure

When you create a label, an .LBX database is created. The .LBX database contains label layout information, environment information and all expressions that you use to define the label contents. For information about this structure refer to the FoxPro *Update* manual.

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