PART III

# Database Tuning and Administration

LEARN TO:

- *Personalize Access*
- *Speed up your database*
- *Administer your database*
- *Provide networking capability*
- *Add security to your database*
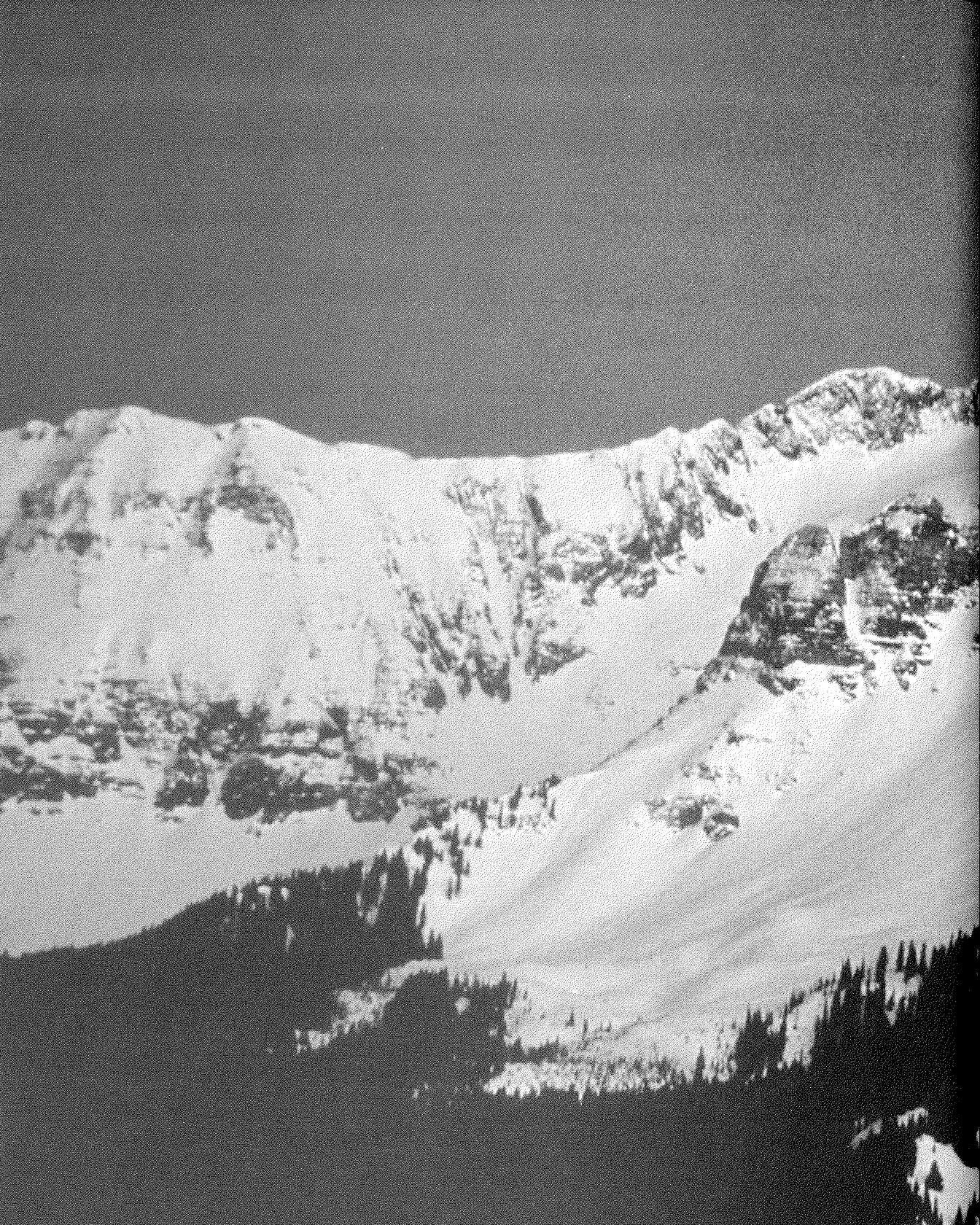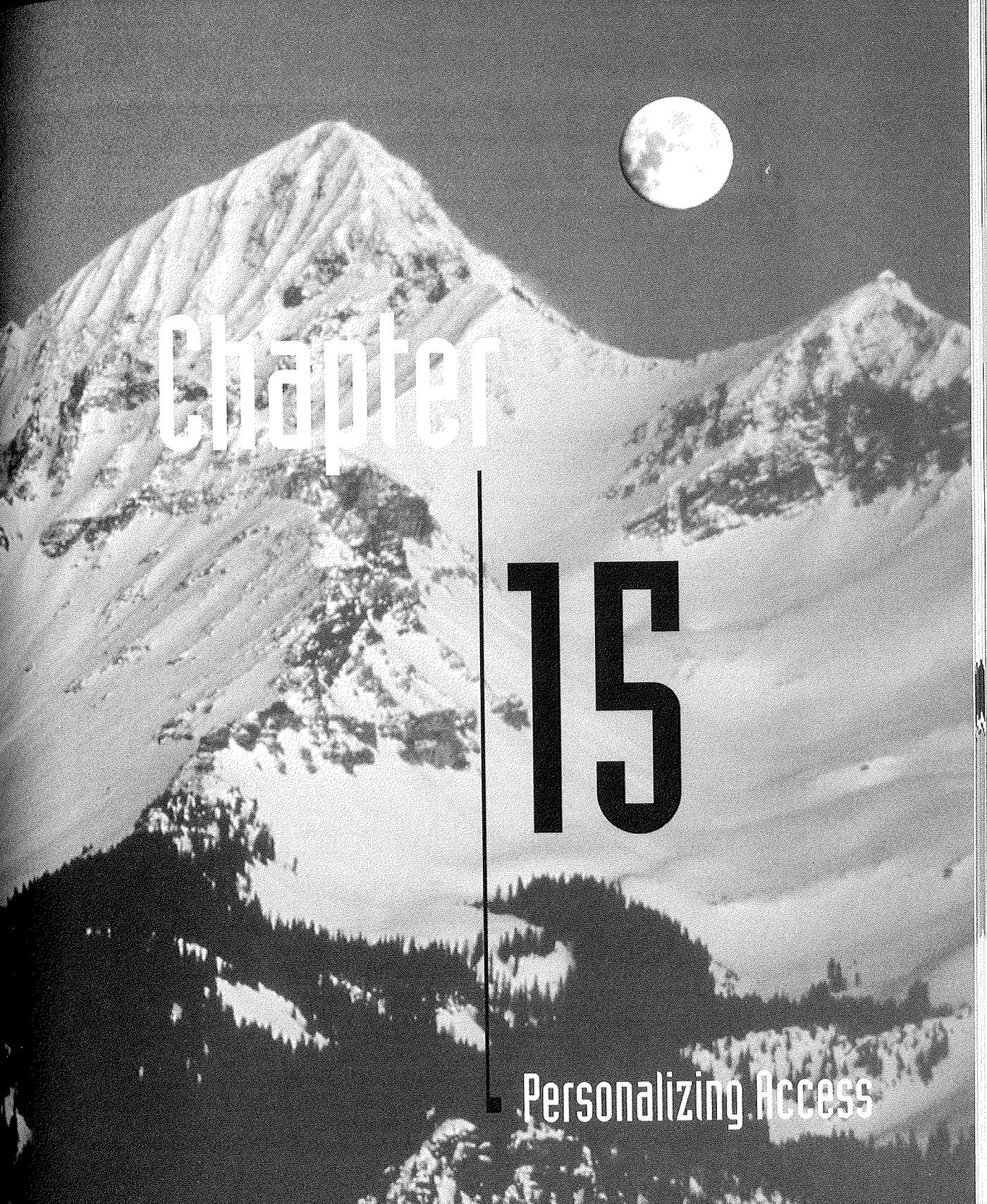
Chapter

15

Personalizing Access

FEATURING

Personalizing Access

You can tailor your Access work environment to your own requirements and working style. If you're happy with the way Access is working now, there's no need to change the default settings and you should feel free to skip this chapter. But if you'd like to learn how to tweak things a bit, read on.

Note that other chapters in this book explain how to customize the features described in Table 15.1, so we won't repeat those discussions here.

Personalizing Your Work Environment

You can personalize many aspects of your Access work environment by following the general steps below:

1. Open a database (if one isn't open already) and choose Tools ➤ Options. You'll see the Options dialog box shown in Figure 15.1.
2. Click on a tab to select a category. (For your convenience, we've arranged the following sections in alphabetical order according to the category of options that each tab controls.)

TABLE 15.1: OTHER PLACES TO LEARN ABOUT CUSTOMIZING ACCESS

TO CUSTOMIZE THIS...	USE THESE OPTIONS...	AND SEE THIS CHAPTER OR HELP INDEX TOPIC
ActiveX Controls	Tools ➤ ActiveX Controls	Look up *ActiveX Controls* subtopics in the Access Help Index.
Menus	View ➤ Toolbars ➤ Customize	24
Security	Tools ➤ Security	18
Toolbars	View ➤ Toolbars	23
Switchboards	Tools ➤ Add Ins ➤ Switchboard Manager	21

FIGURE 15.1

Choosing Tools ➤ Options takes you to the Options dialog box, where you can change numerous default settings in Access.
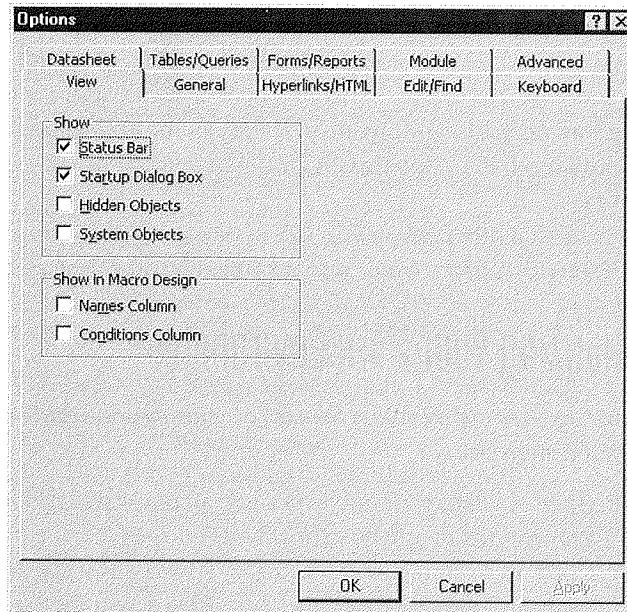
3. Change options, as described in the sections that follow. Depending on the option you're setting, you can type a value, select a value from a drop-down list, select an option button, or select (check) or deselect (clear) a checkbox. Selecting a checkbox activates the associated option (that is, it says "Yes, I want this option"); deselecting the checkbox deactivates the option (that is, it says "No, I don't want this option").

4. Click on OK when you're finished making changes.

For more about the options discussed in the following sections, choose Tools ➤ Options and click on the appropriate category tab. Next, click on the ? button at the upper-right corner of the Options dialog box and then click on the option you're interested in; or right-click on the option name and choose What's This?; or click in a text box or combo box and press Shift+F1. You also can look up topics under *Default Settings* in the Access Help Index.

Changing Advanced Options

The Advanced options (see Figure 15.2) control how Access handles data in a multiuser environment and how it handles OLE and DDE operations.
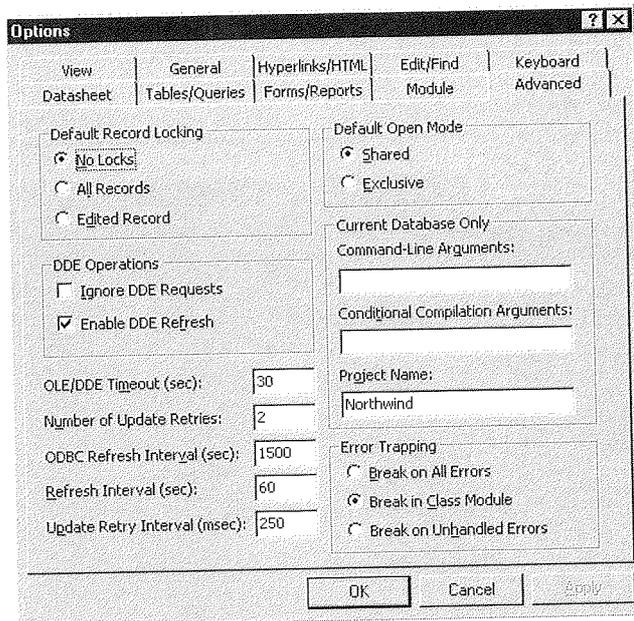
The OLE/DDE options are as follows:

DDE Operations   Select or clear options to choose whether to Ignore DDE Requests from other programs and whether to Enable DDE Refresh at the interval given by the OLE/DDE Timeout (Sec) setting.

OLE/DDE Timeout (Sec)   Specify the interval, in seconds (from 0 to 300), that Access will wait before retrying a failed OLE or DDE operation.

See Chapter 18 and the online Help for details about these multiuser options on the Advanced tab: Default Record Locking, Default Open Mode, Number Of Update Retries, ODBC Refresh Interval (Sec), Refresh Interval (Sec), and Update Retry Interval (Msec).

Changing Datasheet Options

The Datasheet options, shown in Figure 15.3, let you change the default appearance of the datasheet view when you first open a table or query. Most options are self-explanatory, so we won't trouble you with reading through the details about them. However, you might want to know about the Show Animations option, which lets you enable or disable the animated insertion and deletion of records and columns in datasheets.

You can override the Default Colors, Default Gridlines Showing, Default Font, Default Column Width, and Default Cell Effect settings in data-sheet view. To do so, choose the Font, Cells, and Column Width options on the Format menu, or use the Formatting (Datasheet) toolbar, as explained in Chapter 8.

FIGURE 15.3

The Datasheet tab in the Options dialog box.
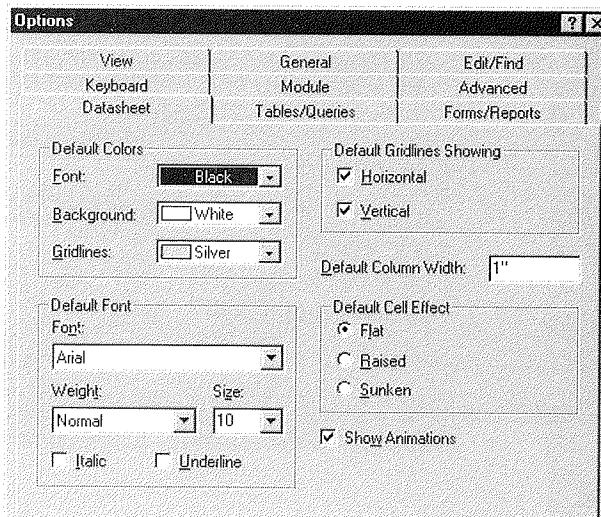
Changing Edit/Find Options

Use the Edit/Find options, shown in Figure 15.4, to choose the default method for doing a Find or Replace operation, to control whether to confirm various types of changes, and to control the size of value lists when you use filter by form.

The Default Find/Replace options are listed below. You can override these settings in the Find In Field (Edit ➤ Find) or Replace In Field (Edit ➤ Replace) dialog boxes, as explained in Chapter 9.

Fast Search   Searches the current field and matches the whole field.
General Search   Searches the current field and matches any part of the field.
**Start Of Field Search**   Searches the current field and matches the beginning character or characters in the field.

The checkbox options below *Confirm* let you control whether Access displays a confirmation message when you change a record (Record Changes), delete a database object (Document Deletions), or run an action query (Action Queries). It's a good idea to leave these options checked.

The options below *Filter By Form Defaults For Database* control which fields supply values when you use the Filter By Form feature (see Chapter 9), and how many rows to display in a filter-by-form list. These options affect the current database only, and you can set different defaults for other databases. You can override the options for a given filter-by-form operation, as explained in Chapter 9. To speed up filter-by-form operations, limit the Filter By Form Defaults settings to local indexed fields and reduce the number of records read.

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FIGURE 15.4

The Edit/Find tab in the Options dialog box.

Keyboard	Module	Advanced
Datasheet	Tables/Queries	Forms/Reports
View	General	Edit/Find

Default Find/Replace Behavior
- ⦿ Fast Search
- ○ General Search
- ○ Start of Field Search

Confirm
- ☑ Record Changes
- ☑ Document Deletions
- ☑ Action Queries

Filter By Form Defaults for Order Entry1 Database

Show list of values in
- ☑ Local Indexed Fields
- ☑ Local Non-indexed Fields
- ☐ ODBC Fields

Don't display lists where more than this number of records read:
1000

Changing Forms/Reports Options

Use the Forms/Reports options, shown in Figure 15.5, to control the default templates used for form and report designs and to define the selection behavior when you drag the mouse pointer to select controls in form and report design view.

The Forms/Reports options are

Selection Behavior Choose Partially Enclosed to have Access select controls that are even partially contained within the frame. Choose Fully Enclosed to have Access select only controls that are completely contained within the frame you draw while dragging the pointer.

Form Template The default is Normal, a built-in, general-purpose template that Access uses to create an AutoForm or blank form. You can specify any existing form in the database as the form template, if you wish. If you specify a form that doesn't exist in the database, Access will use the built-in Normal form template.

Report Template As with forms, the default report template is Normal, but you can specify any existing report in the database as the report template. Access uses this template to create an AutoReport or blank report. If you specify a report that doesn't exist in the database, Access will use the built-in Normal report template.

FIGURE 15.5

*The Forms/
Reports tab in
the Options
dialog box.*
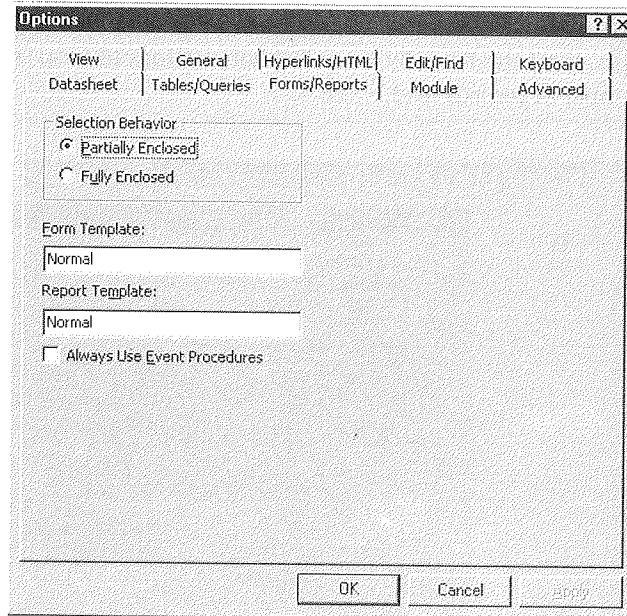
Always Use Event Procedures When this option is selected (checked), Access will bypass the Choose Builder dialog box and go directly to the Module window after the builder button is clicked on a property sheet.

> **NOTE**
>
> Form and report templates define whether to include a form or report header and footer, whether to include a page header and footer, the dimensions of each section, and the default properties for each control. A template does not create controls on a new form or report.

When designing a form or report, you can override the default settings in many ways. For example, you can change the default properties for new controls that you add to a form or report in design view, and you can use AutoFormat styles to format all or part of a design. See Chapter 13 for complete details about designing forms and reports.

> **TIP**
>
> If you'd like to use custom control settings for all new forms or reports that you design, customize the properties for each control to your liking. Then save the design and define it as a template in the Form Template or Report Template option setting described above.

Changing General Options

The General options (see Figure 15.6) let you change these default settings:

Print Margins Use the Print Margins options to assign default Left Margin, Right Margin, Top Margin, and Bottom Margin settings for new reports and forms (the settings have no effect on existing forms and reports). Initially all the margins are one (1) inch wide.

To change the margin settings in an existing form or report, open the form or report in design view, choose File ➤ Page Setup, click on the Margins tab, change the Top, Bottom, Left, and Right settings as needed, and then click on OK (see Chapter 9).

Default Database Folder Specify the folder in which Access will store or search for databases. The default is the dot (.) which stands for the default Access working directory, a folder named My Documents. (If you rename the My Documents folder in Windows 95 later, Windows 95 will adjust the appropriate Registry settings to point to the renamed folder automatically.)

FIGURE 15.6

*The General tab in the Options dialog box.*
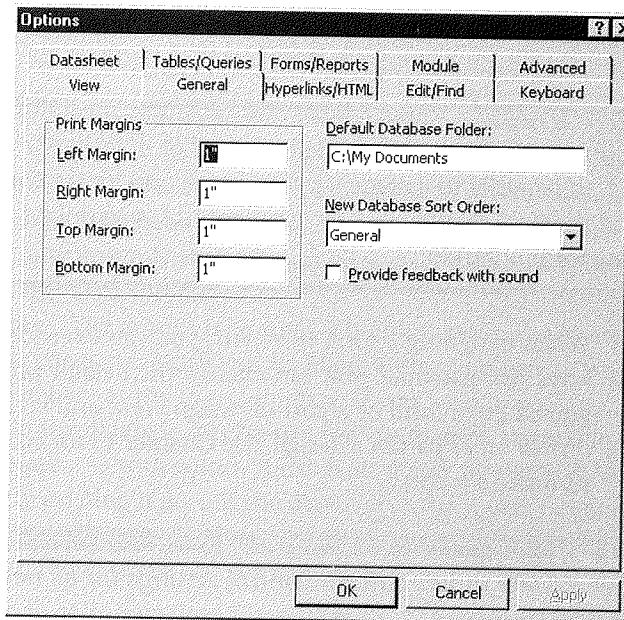
New Database Sort Order   Choose the language used for alphabetic sorting of new databases. Options include General (for English), Traditional Spanish, Dutch, and several other languages. To change the sort method for an existing database, make the change here (in the New Database Sort Order text box) and then compact the existing database as discussed in Chapter 17.

Provide feedback with sound   When this option is selected (checked), Access will play sounds when events like completion of printing happen.

Changing Hyperlinks/HTML Options

The Hyperlinks/HTML options let you customize the way hyperlinks are shown on the screen. You can also set options for connecting with HTML data and ActiveX Server data.
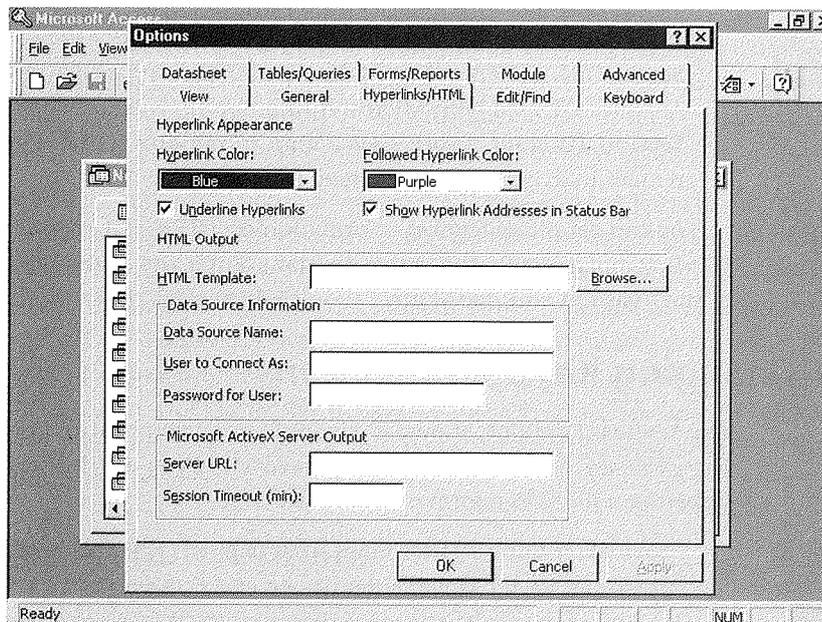
Hyperlink Color   Tells Access what color to use for showing hyperlinks that have not yet been followed.

Underline Hyperlinks   When checked, has Access display hyperlinks with underlines.

Followed Hyperlink Color   Specifies the color on screen of hyperlinks that have been followed (jumped to).

Show Hyperlink Addresses in Status Bar   When checked, has Access show the hyperlink address for a hyperlink that is clicked on. (Hyperlinks can appear as a shortcut name, instead of an address.)

HTML Template   Names a template for HTML: files that are created by exporting to HTML format or using the Publish to the Web Wizard. An HTML template has specifications for file headers, footers, and other visual elements.

Data Source Name   Specifies the name of the Open Database Connectivity (ODBC) connection used to query Access data for dynamic Web pages.

User to Connect As The user name for connecting to the ODBC data source named above.

Password The password for the above user name.

Server URL The location of the ActiveX Server Page (ASP) file on the Web server. ASP files are used with Microsoft Internet Information Server 3.0 or later.

Session Timeout (min) Sets a limit in minutes for how long a Web session can remain inactive before it is timed out (terminated).

You can get more detailed information on ODBC data connections, ASP files, and HTML templates from the Office Assistant. Enter any of these topics in the search box of the Assistant and press Enter. Then click on your choice in the list that appears.

Changing Keyboard Options

The Keyboard options, shown in Figure 15.7, let you control how the Enter key, arrow keys, Tab key, and insertion point behave when you use the keyboard to move within or between fields in a form or datasheet.

Move After Enter Determines what happens when you press Enter in a field. Your options are Don't Move (Enter has no effect), Next Field (Enter moves the cursor to the next field), or Next Record (Enter moves the cursor to the first field in the next record).

Arrow Key Behavior Choose Next Field if you want the cursor to move to another field when you press ← or →, or choose Next Character if you want the cursor to move within the field when you press those keys. If Next Field is selected, you can press F2 and then ← or → to move the cursor within a field.

FIGURE 15.7

The Keyboard options in the Options dialog box.
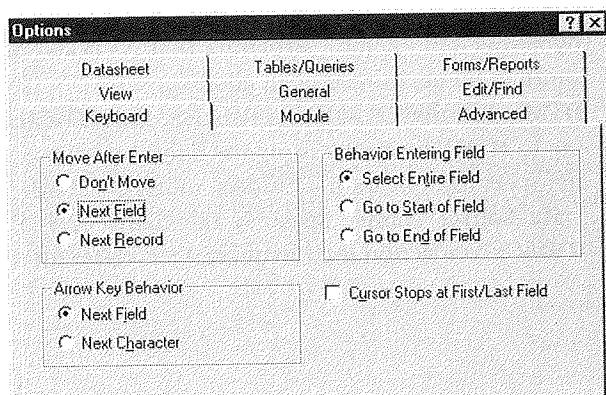
Behavior Entering Field Determines what happens when the cursor lands in a field. Your options are Select Entire Field, Go To Start Of Field, or Go To End Of Field.

Cursor Stops At First/Last Field Determines what happens in a datasheet when you press the ← key in the first field of a row or the → key in the last field of a row. Select (check) this option to have the cursor stay in the current field, or deselect (clear) it to move the cursor to the previous or next record.

When designing a form, you can control the behavior of the Enter key in text boxes (that is, Text and Memo fields). To do this, open the form in design view, open the property sheet, and click on the Other tab on the property sheet. Next, select the text box control, and then change the Enter Key Behavior property either to Default (so that it uses the Move After Enter setting discussed above) or to New Line In Field (so that pressing the Enter key moves the cursor to a new line in the field). To simplify entry of multiple text lines in a Memo field, the control's Enter Key Behavior is initially set to New Line In Field. If you choose Default instead, you typically must press Ctrl+Enter to enter a new line in the Memo field's text box.

Changing Module Options

The Module Design options, shown in Figure 15.8, determine the default characteristics of the module design window used for creating Visual Basic procedures and functions (see Chapter 25).

As Figure 15.8 shows, you can change colors and font used for your code, various coding options, how code is displayed in the Module window (Code View), and some settings that apply to the Current Database Only. For more about using and customizing the Module window, see Chapter 25 and the online Help for the Module tab, or type **Modules** in the search box of the Office Assistant.

Changing Tables/Queries Options

Use the Tables/Queries options (see Figure 15.9) to choose defaults for new table fields and indexes and to control default behavior in the query design window.

The Table Design options are

Default Field Sizes Lets you specify the default field size for newly created text and number fields in table design view. Specify a Text field size from 0 to 255; choose a default Number field size from the Number drop-down list.

Default Field Type Lets you choose the default field type for newly created fields in table design view.

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FIGURE 15.8

The Module tab in the Options dialog box.
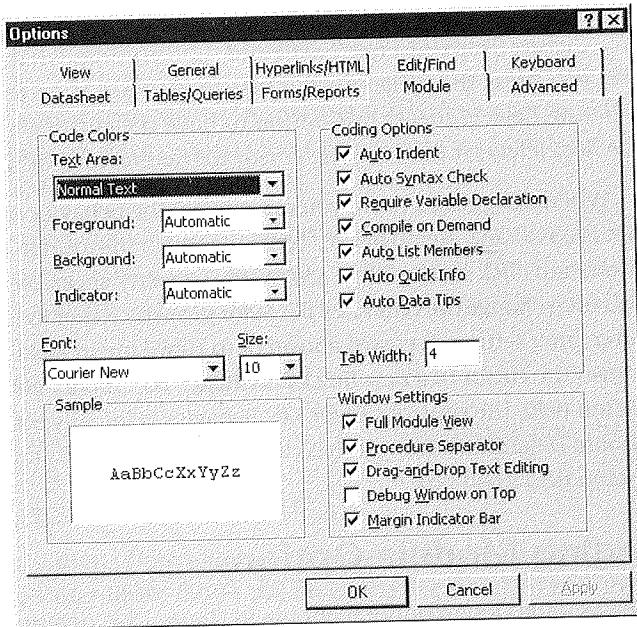
FIGURE 15.9

The Tables/ Queries tab in the Options dialog box.
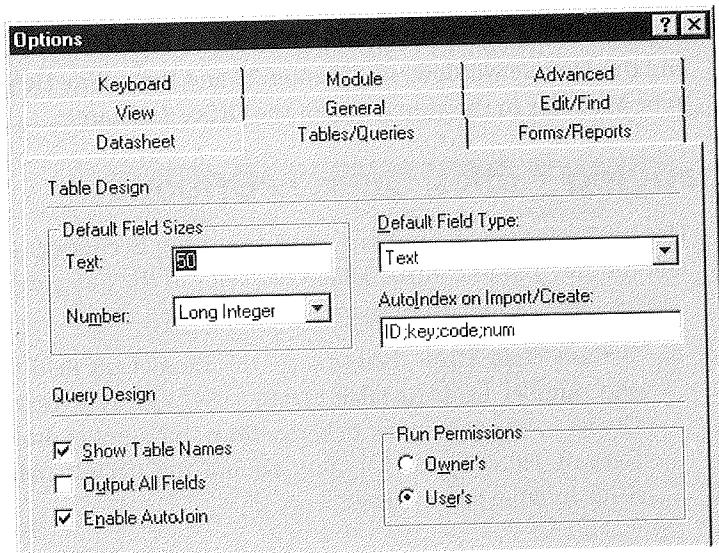
AutoIndex On Import/Create   Lets you specify field names that are indexed automatically when you first create them in table design view or when you import them from an external file. The Indexed property on the General tab of the table design window will display Yes (Duplicates OK) for automatically indexed fields.

In the AutoIndex On Import/Create text box, enter the beginning characters or ending characters that the automatically indexed field names should contain, and separate each field name (or partial field name) with a semicolon (;). *Example:* the AutoIndex On Import/Create setting shown in Figure 15.9 will cause Access to automatically index field names such as ID, MyID, KeyField, Code1, and AutoNum.

> **WARNING**
>
> Each table can have up to 32 indexes. You're likely to bump up against that 32-index limit rather quickly if you include many field names in the AutoIndex On Import/Create option or if many fields that you create or import include the field names listed in the AutoIndex On Import/Create text box.

The Query Design options are

Show Table Names   Lets you display or hide table names in the QBE grid. To override this setting, choose View ➤ Table Names in the query design window.

Output All Fields   When selected, all fields in a query's underlying tables or queries appear when the query is run; when deselected only the fields added to the QBE grid appear. To override this setting, change the query's Output All Fields property.

Enable AutoJoin   Lets you choose whether to create automatic inner joins between two tables that you add to the query design window. Access can create an inner join for tables if those tables are already joined in the Relationships window, or the tables contain fields that have the same field name and the same or compatible data type in each table. Even if you disable automatic joins, you can create them manually in the query design window.

Run Permissions   Choose Owner's to run new queries with the owner's permissions, or choose User's to run new queries with the current user's permissions. These permissions are important on secured databases. To view or change a query's owner, choose Tools ➤ Security ➤ User And Group Permissions from the menus and then click on the Change Owner tab. To override the query's default run permissions, open the query in design view and change its Run Permissions property.

See Chapter 6 for details about designing tables, Chapter 7 for more information about importing tables, Chapter 10 for more about queries, and Chapter 18 for tips on networking and security.

Changing View Options

Use the View options, shown in Figure 15.10, to control the appearance of the database window and macro design windows and to choose whether the status bar and startup dialog box appear.

Status Bar   Lets you display or hide the status bar. (Your life will be easier if you leave the status bar visible, so you can see the helpful hints Access displays there.)

Startup Dialog Box   Controls whether the startup dialog box appears when you start Access. When this option is selected, Access displays the initial dialog box that lets you choose which database to open; when deselected, you're taken directly to the Access main menu, which has only the File, Tools, and Help menus.

NOTE

If you turn off the startup dialog box, you must open a database (File ➤ Open Database) or create a database (File ➤ New Database) before you can choose Tools ➤ Options again.

FIGURE 15.10

The View tab in the Options dialog box.
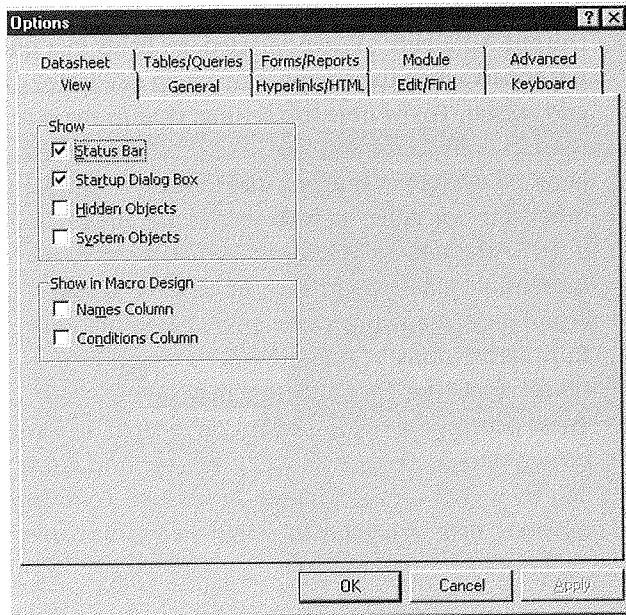
Hidden Objects Controls whether to display or hide objects in the database window if they have a property of Hidden. When you choose to display hidden objects, their icons will be dimmed in the database window. To hide an object, go to the database window, locate the object you want to hide, right-click on the object's name, select (check) the Hidden property near the bottom of the dialog box, and then click on OK.

System Objects Controls whether to display or hide the names of internal system objects that Access creates, or system objects that you create. These system objects start with the letters Msys or Usys. If you select (check) the System Objects option, Access will show system objects along with other table names in the database window, though their icons will be dimmed. (It's best to leave these objects hidden to avoid confusion.)

> **WARNING**
> Don't mess around with any of the system objects that Access creates if you aren't absolutely sure of what you're doing. The results can be disastrous.

Names Column Controls whether to display or hide the Macro Name column in the macro design window. To override this setting, choose View ➤ Macro Names from the macro design menus.

Conditions Column Controls whether to display or hide the Condition column. To override this setting, choose View ➤ Conditions from the macro design menus.

> **TIP**
> To change your screen's video resolution (if your screen supports adjustable resolutions and you're using Windows 95), minimize Access and other programs you're running, so you can see the Windows 95 desktop. Then right-click on any blank area on the Windows desktop, choose Properties, click on the Settings tab in the Display Properties dialog box, drag the slider control below the Desktop Area option, and then click on OK. When prompted, click on OK and then click on Yes to accept the changes.

Personalizing a Database

You can personalize a database in several ways:

- Set *startup options* that take effect when you open the database. See the next section.

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- Set *database properties* that document your database and make it easier to find the database later. See "Changing the Database Properties" in Chapter 5.
- Set *object properties* for objects that appear in the database window. See "Changing Properties of an Entire Table or Object" in Chapter 6.

Changing Startup Options

The Startup options let you control options that take effect when you open a particular database. You can use the Startup dialog box instead of, or in addition to, an AutoExec macro. The AutoExec macro will run after the Startup dialog box options take effect. (See Chapters 20 and 28 for more about macros.)

To set the Startup options:

1. Open the database for which you want to set startup options.

2. Choose Tools ➤ Startup; or right-click on any gray area on the database window and choose Startup. You'll see the Startup dialog box, shown in Figure 15.11.

3. Change any of the options described just below.

4. Click on OK to accept the new settings and close the Startup dialog box.

5. Close the database and open it again if necessary.

T I P

To bypass the Startup settings and use the default options shown in Figure 15.11, hold down the Shift key while opening the database.

FIGURE 15.11

The Startup dialog box after we clicked on the Advanced button.

The Startup dialog box options are described below. Note that some options take effect as soon as you close the Startup dialog box; however, others don't take effect until the next time the database is opened (these "delayed" options are marked with an asterisk below).

Application Title   Lets you display your own application title in the Access title bar. Type the title you want to display. To use the default application title of *Microsoft Access*, leave the Application Title text box empty.

Application Icon   Lets you replace the standard Access "key" icon with an application icon of your own choosing. The icon appears in the Access title bar and on the application's Taskbar button. To specify an icon, type its name into the Application Icon text box; or click on the Build button next to the Application Icon option, locate the icon (*.ico) or bitmap (*.bmp) file you want to display, and then double-click on its file name. (On Windows NT, you can use icon files only, not bitmap files.) If you'll be distributing your application, it's best to put the icon or bitmap file in the same folder as your application. To use the default icon for Access, leave the Application Icon text box empty.

Menu Bar *   Lets you choose a global menu bar to display when you open the current database. Choose an existing menu bar from the drop-down list next to the Menu Bar option, or choose (Default) to use the Access default menu bar. Chapter 24 explains how to create custom menu bars. Until you create a custom menu bar, the only choice you'll see for this option is (default).

Allow Full Menus *   Lets you choose whether a full set, or a restricted set, of menus appears on the Access built-in menu bars. Select (check) this option to display a full set of built-in menus; deselect (clear) this option to display a restricted set of built-in menus that doesn't allow design changes to database objects.

Allow Default Shortcut Menus *   Lets you choose whether the Access default shortcut menus are available. Select (check) this option to display shortcut menus when you right-click on a toolbar or other object; deselect (clear) this option to prevent shortcut menus from appearing when you right-click.

Allow Viewing Code After Error *   Lets you control whether to enable the Ctrl+Break key and allow code viewing in the Module window after a run-time error occurs in the application. (When you're finished developing your application, you may want to deselect this option to prevent users from viewing your code.)

Display Form *   Lets you choose which form to display when the database is opened. To avoid displaying any form, choose (None) from the Display Form drop-down list. The applications you create with the Database Wizard specify a form named *Switchboard* as the Display Form.

- Set *database properties* that document your database and make it easier to find the database later. See "Changing the Database Properties" in Chapter 5.
- Set *object properties* for objects that appear in the database window. See "Changing Properties of an Entire Table or Object" in Chapter 6.

Changing Startup Options

The Startup options let you control options that take effect when you open a particular database. You can use the Startup dialog box instead of, or in addition to, an AutoExec macro. The AutoExec macro will run after the Startup dialog box options take effect. (See Chapters 20 and 28 for more about macros.)

To set the Startup options:

1. Open the database for which you want to set startup options.
2. Choose Tools ➤ Startup; or right-click on any gray area on the database window and choose Startup. You'll see the Startup dialog box, shown in Figure 15.11.
3. Change any of the options described just below.
4. Click on OK to accept the new settings and close the Startup dialog box.
5. Close the database and open it again if necessary.

TIP

To bypass the Startup settings and use the default options shown in Figure 15.11, hold down the Shift key while opening the database.

FIGURE 15.11

The Startup dialog box after we clicked on the Advanced button.

The Startup dialog box options are described below. Note that some options take effect as soon as you close the Startup dialog box; however, others don't take effect until the next time the database is opened (these "delayed" options are marked with an asterisk below).

Application Title   Lets you display your own application title in the Access title bar. Type the title you want to display. To use the default application title of *Microsoft Access,* leave the Application Title text box empty.

Application Icon   Lets you replace the standard Access "key" icon with an application icon of your own choosing. The icon appears in the Access title bar and on the application's Taskbar button. To specify an icon, type its name into the Application Icon text box; or click on the Build button next to the Application Icon option, locate the icon (*.ico) or bitmap (*.bmp) file you want to display, and then double-click on its file name. (On Windows NT, you can use icon files only, not bitmap files.) If you'll be distributing your application, it's best to put the icon or bitmap file in the same folder as your application. To use the default icon for Access, leave the Application Icon text box empty.

Menu Bar *   Lets you choose a global menu bar to display when you open the current database. Choose an existing menu bar from the drop-down list next to the Menu Bar option, or choose (Default) to use the Access default menu bar. Chapter 24 explains how to create custom menu bars. Until you create a custom menu bar, the only choice you'll see for this option is (default).

Allow Full Menus *   Lets you choose whether a full set, or a restricted set, of menus appears on the Access built-in menu bars. Select (check) this option to display a full set of built-in menus; deselect (clear) this option to display a restricted set of built-in menus that doesn't allow design changes to database objects.

Allow Default Shortcut Menus *   Lets you choose whether the Access default shortcut menus are available. Select (check) this option to display shortcut menus when you right-click on a toolbar or other object; deselect (clear) this option to prevent shortcut menus from appearing when you right-click.

Allow Viewing Code After Error *   Lets you control whether to enable the Ctrl+Break key and allow code viewing in the Module window after a run-time error occurs in the application. (When you're finished developing your application, you may want to deselect this option to prevent users from viewing your code.)

Display Form *   Lets you choose which form to display when the database is opened. To avoid displaying any form, choose (None) from the Display Form drop-down list. The applications you create with the Database Wizard specify a form named *Switchboard* as the Display Form.

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Display Database Window * Lets you choose whether to display or hide the database window when you open the database. It's often handy to hide the database window if your database displays a form at startup. (Even if the database window doesn't appear at startup, you usually can display it anytime by pressing F11.)

Display Status Bar * Lets you choose whether the status bar appears at the bottom of the Access window (usually it's best to leave this option checked, so you can see the status bar). To turn off the status bar for all Access databases, choose Tools ➤ Options, click on the View tab, and deselect (clear) Status Bar. The status bar won't appear in the current database if you've turned off the status bar for the current database, all databases, or both.

Shortcut Menu Bar * Lets you choose a shortcut menu bar to display when you right-click on a form or report in form view or print preview. Choose an existing shortcut menu bar from the drop-down list next to the Menu Bar option, or choose (Default) to use the Access default shortcut menu bar. See Chapter 24 for details on creating custom shortcut menus.

Allow Built-In Toolbars * Lets you choose whether to allow users to display the Access built-in toolbars. This setting will not affect custom toolbars that you add. Normally you'll want to leave the toolbars available, unless you're developing an application that has its own custom toolbars and you don't want Access toolbars to appear.

Allow Toolbar Changes * Lets you choose whether to allow users to change the built-in toolbars and custom toolbars. Select (check) this option to allow changes to the toolbars. Deselect (clear) this option to disable the View ➤ Toolbars ➤ Customize command and the right mouse button on toolbars.

Use Access Special Keys * Lets you choose whether to enable or disable these special keys: F11 or Alt+F1 (displays the database window), Ctrl+G (displays the debug window), Ctrl+F11 (toggles between the custom menu bar and the built-in menu bar), Ctrl+Break (stops code from running and displays the current module in the Module window).

For details about any option in the Startup dialog box, right-click on the option name and click on What's This?, or click in an option's text box and then press Shift+F1. For information about important things to consider when you alter settings in the Startup dialog box, type **Startup Dialog Box** in the Office Assistant search box and then click on the *Considerations when setting options in the Startup dialog box* topic.

Installing Wizards, Builders, and Menu Add-Ins

Access Wizards, builders, and menu add-ins are contained in special library databases. You can use the Add-In Manager to install or uninstall existing libraries, and to add new library databases.

> **NOTE**
>
> Library databases have the file extension .mda; otherwise, they are similar to standard database (.mdb). Several libraries come with Access and are installed automatically by the Setup program (see Appendix A); however, these libraries do not appear in the Add-In Manager dialog box. You also can create your own libraries or purchase them from third-party suppliers.

To get started with the Add-In Manager, follow these steps:

1. Choose Tools ➤ Add-Ins ➤ Add-In Manager. The Add-in Manager dialog box, shown in Figure 15.12, will appear. Installed libraries are marked with an ×.
2. Do one of the following:

   - **To add an add-in to the list,** click on the Add New button, locate and click on the add-in's file name in the File Open dialog box, and then click on OK (or double-click on the file name). This procedure copies the library to the Access installation folder (usually \MSOffice\Access) and installs it in the Available Add-Ins list.
   - **To install an available add-in,** click on the add-in name in the Available Add-Ins list and then click on the Install button.

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FIGURE 15.12

The Add-In Manager dialog box with one add-in installed. (This add-in is courtesy of Ken Getz at KNG Consulting.)
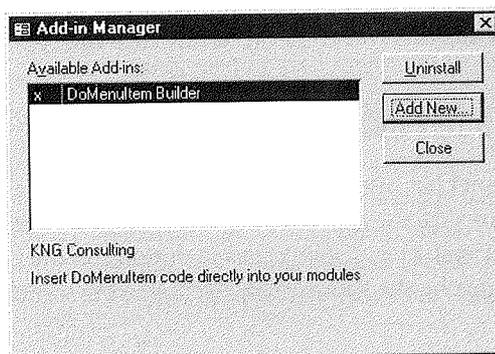
- **To uninstall a currently available add-in**, click on the add-in name in the Available Add-Ins list and then click on the Uninstall button. When the library is uninstalled, it's available on disk but won't be loaded into memory and can't be used. You can conserve memory and reduce the time it takes to load Access by uninstalling libraries that you aren't using.
- **To quickly install or uninstall an add-in**, double-click on the add-in name in the Available Add-Ins list (double-clicking will toggle the × on or off).

3. Click on Close when you're done using the Add-In Manager. You'll be returned to the database window.

> **WARNING**
>
> Don't just experiment with installing and uninstalling add-ins. If you do, you might lose Wizards and options on the Tools ➤ Add-Ins menus. To restore lost add-ins, reinstall Access and any third-party add-ins.

You can learn more about the Add-In Manager by searching for *Add-In Manager* in the Access Answer Wizard. For details about creating and installing library databases, see Chapter 16 "Creating Wizards, Builders, and Add-Ins" in the Access manual titled *Building Applications with Microsoft Access for Windows 95*.

Customizing the Add-Ins

In previous versions of Access, you could customize Wizards by using the Add-In Manager. This feature is no longer available (and often isn't needed) because many Wizards allow customization when you use them.

If you need to customize the Table Wizard, you can learn how to do so in the Access Developer's Toolkit. For more information on the Access Developers Toolkit, look up *Developer's Toolkit, Contents Of* in the Access Help Index.

Other Ways to Personalize Access

This chapter has discussed many ways to personalize Access. But there are more! You also can personalize the appearance and behavior of Access by changing options in Windows Control Panel, by specifying startup options on the command line that starts Access, and by customizing the Registry file. The following sections briefly discuss these techniques.

Using Control Panel to Customize Access

Like most Windows programs, Access inherits many of its settings from options that you set in Windows Control Panel. To get started with Control Panel, click on the Start button on the Taskbar, and choose Settings ➤ Control Panel (or double-click on the My Computer icon on your desktop, and then double-click on the Control Panel folder). When the Control Panel window opens, double-click on the icon for the settings you want to change (see Table 15.2). Remember that your changes in Control Panel will affect most other Windows programs.

TABLE 15.2: CONTROL PANEL SETTINGS FOR CUSTOMIZING ACCESS AND OTHER PROGRAMS

ICON	SETTINGS OPTION	WHAT IT DOES
32bit ODBC	32-bit ODBC	Lets you add, delete, or configure data sources and install new 32-bit ODBC drivers on your computer. A data source includes the data source name, description, server, network address, network library, and other information used to identify and locate data on a network (see Chapter 18).
Display	Display	Lets you choose the colors used for various parts of the screen and change the appearance of your Windows desktop.
Fonts	Fonts	Lets you add and remove fonts and set TrueType options.
Network	Network	Lets you manage your network configuration, choose a primary network logon, enable or disable file and printer sharing, identify your computer to the network, and choose how to allow access to shared resources on your computer (see Chapter 18).
Passwords	Passwords	For networked computers, this option lets you change your Windows password and the password for other password-protected devices, allow remote administration of your computer, and choose personal preferences for users of your computer (see Chapter 18).

Continued ▐▶

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TABLE 15.2: CONTROL PANEL SETTINGS FOR CUSTOMIZING ACCESS AND OTHER PROGRAMS

ICON	SETTINGS OPTION	WHAT IT DOES
Printers	Printers	Lets you install and remove printers, change printing settings, and select the printer you want to use as the default printer.
Regional Settings	Regional Settings	Lets you specify international settings, including units of measurement, list separators, and formats for dates, times, currency, and numbers.
System	System	Lets you manage hardware devices on your computer, maintain hardware configuration profiles, and optimize various Windows settings for better performance. (Windows usually is optimized for better performance automatically.)

For more information about the options listed in Table 15.2, see your Windows documentation or use the Help ➤ Help Topics menus in Control Panel. You also can click on any Control Panel icon and look at the status bar to find out what it does, and you can right-click on options in the various Control Panel dialog boxes and choose What's This?

Using Command-Line Options When Starting Access

You can use *startup options* to open a database automatically, run a macro, supply a user account name or password, and more, simply by specifying options on the command line that starts Microsoft Access. Access gives you two ways to specify startup options, and we'll explain both methods shortly:

- **On the Start ➤ Programs Menus** Access always starts with any options you've specified in the Start ➤ Programs menus. Typically, only one Microsoft Access entry appears on these menus.
- **In a Shortcut** Access starts with any options you've specified in the shortcut. You can set up as many shortcuts as you need (see Chapter 1), and you can place those shortcuts in a folder or directly on your Windows desktop.

A standard Access startup command, without any command-line options, usually looks like this:

```
c:\msoffice\access\msaccess.exe
```

To specify command-line options, begin with the startup command shown above, then type a space, and then type additional options as needed (with each option separated by a space). The example below starts Access and opens the Order Entry1 database in the folder named My Documents on drive C (of course you must enter all the text on one line):

```
c:\msoffice\access\msaccess.exe
 "c:\My Documents\Order Entry1"
```

WARNING

If the path to your database contains spaces, be sure to enclose the path in double quotation marks, as shown in the example above. If the path doesn't include spaces, you can omit the double quotation marks.

This example starts Access and opens the Order Entry1 database in run-time mode:

```
c:\msoffice\access\msaccess.exe
 "c:\My Documents\Order Entry1" /runtime
```

Table 15.3 shows the most commonly used Access command-line options. For a complete list and more information, search for *Command Line Options* in the Access Answer Wizard, and then double-click on *Startup Command-Line Options* under *Tell Me About*.

TABLE 15.3: COMMONLY USED ACCESS COMMAND-LINE OPTIONS

OPTION *	EFFECT
database	** Opens the specified *database*.
source database / Compact *target database*	** Compacts the *source database* to the name specified as the *target database*, and then closes Access. Omit the *target database* name if you want to compact the database to the *source database* name.
Database /Excl	Opens the specified database for exclusive access. Omit the /Excl option to open the database for shared access in a multiuser environment
/Nostartup	Starts Access without displaying the startup dialog box. Same as choosing Tools ➤ Options, and deselecting Startup Dialog Box on the View tab of the Options dialog box.

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TABLE 15.3: COMMONLY USED ACCESS COMMAND-LINE OPTIONS (CONTINUED)

OPTION *	EFFECT
/Profile *user profile*	Starts Access using the options in the specified *user profile* instead of the standard Windows Registry settings created when you installed Microsoft Access. The /Profile option replaces the /ini option used in previous versions of Access to specify an initialization file. See the Microsoft Access Developer's Toolkit for tools and information about creating user profiles.
/Pwd *password*	Starts Access using the specified *password* (see Chapter 18).
/Repair *database*	Repairs the specified *database* and then closes Access (see Chapter 17).
Database /RO	Opens the specified database for read-only access.
database /Runtime	Starts Access in run-time mode and opens the specified *database.* In run-time mode, users cannot access the database window or open database objects in Design view. This option is useful for running turnkey applications, such as those the Database Wizard creates.
/User *user name*	Starts Access using the specified *user name* (see Chapter 18).
/Wrkgrp *workgroup information file*	** Starts Access using the specified *workgroup information file* (see Chapter 18).
/X *macro*	Starts Access and runs the specified *macro.* You also can run a macro when you open a database by using an AutoExec macro (see Chapters 20 and 28).

* To specify a forward slash (/) or semicolon (;) on the command line, type the character twice. For example, to specify the password ;eao/rnaa47 on the command line, type **;;eao//rnaa47** following the /Pwd command-line option.

** Specify a path name if necessary. If the path name contains any spaces, enclose the entire path name in double quotation marks. See the example in the chapter.

Specifying Startup Options on the Start Menu

If you always want Access to use the same startup options, you can modify the Microsoft Access entry on the Start ➤ Programs menus:

1. Right-click on the Start button on the Windows Taskbar, and choose Explore. The Exploring Start Menu window will open.

2. Double-click on the Programs folder in the right pane of the window and then double-click on folders as needed until you locate the Microsoft Access shortcut icon.
3. Right-click on the Microsoft Access shortcut icon and choose Properties. Or click on the icon and press Alt+Enter.
4. Click on the Shortcut tab in the Microsoft Access Properties dialog box.
5. Press the End key to move the insertion point to the right of the Access startup command in the Target text box.
6. Type a space and enter the command-line settings you want to use.
7. (Optional) Set the Start In, Shortcut Key, and Run options in the dialog box. (To learn more about any of these options, right-click on an option name and choose What's This?.)
8. Click on OK to return to the Exploring window.
9. Close the Exploring window.

The next time you use the Start ➤ Programs menus to start Access, your command-line options will take effect.

Specifying Startup Options in a Shortcut

Chapter 1 explained how to create shortcuts. Assuming you've already set up a shortcut for Microsoft Access, here's how to modify it to include startup options:

1. Locate the shortcut in a folder or on your desktop.
2. Right-click on the Microsoft Access shortcut icon and choose Properties or click on the icon and press Alt+Enter.
3. Fill in the Microsoft Access Properties dialog box, as explained in steps 4 through 7 of the previous section.
4. Click on OK to accept the changes.

The next time you double-click on an Access shortcut icon, Access will start with the command-line options you chose.

About the Registry File

When Access starts up, it reads various settings from the Windows *Registry file.* (In Access 2.0, startup settings were stored in the initialization file, named \windows\ msacc20.ini.) Many of these settings are defined when you install Access, and some are updated when you use certain Access utility options, such as the Workgroup Adminis-trator discussed in Chapter 18. You'll rarely need to update the Registry file manually, but if you do so, *be very careful*—and back up the Registry first! Incorrect updates to the Registry can prevent Access and other Windows programs from working correctly.

If you do need to update the Registry, you must use the Registry Editor to make the changes. To get started, click on the Start button on the Windows Taskbar, choose Run, type **regedit**, and press Enter. Your changes will take effect the next time you start Access.

To learn more about changing the Registry, search for *Registry* in the Access Answer Wizard and then explore subtopics as needed.

Where to Go from Here

In this chapter you've learned many ways to personalize Access to your own working style. The next chapter presents ways to analyze your databases and speed up their performance.

What's New in the Access Zoo?

The options for customizing Access 97 for Windows 95 have been reorganized a bit. Here are some reminders to help upgraders figure out where to look for changes:

- **The Options dialog box has a new page for hyperlink options.** Use Tools ➤ Options to get to this tabbed dialog box.

- **Use the Customize dialog box to change menus and toolbars now.** Choose View ➤ Toolbars ➤ Customize.
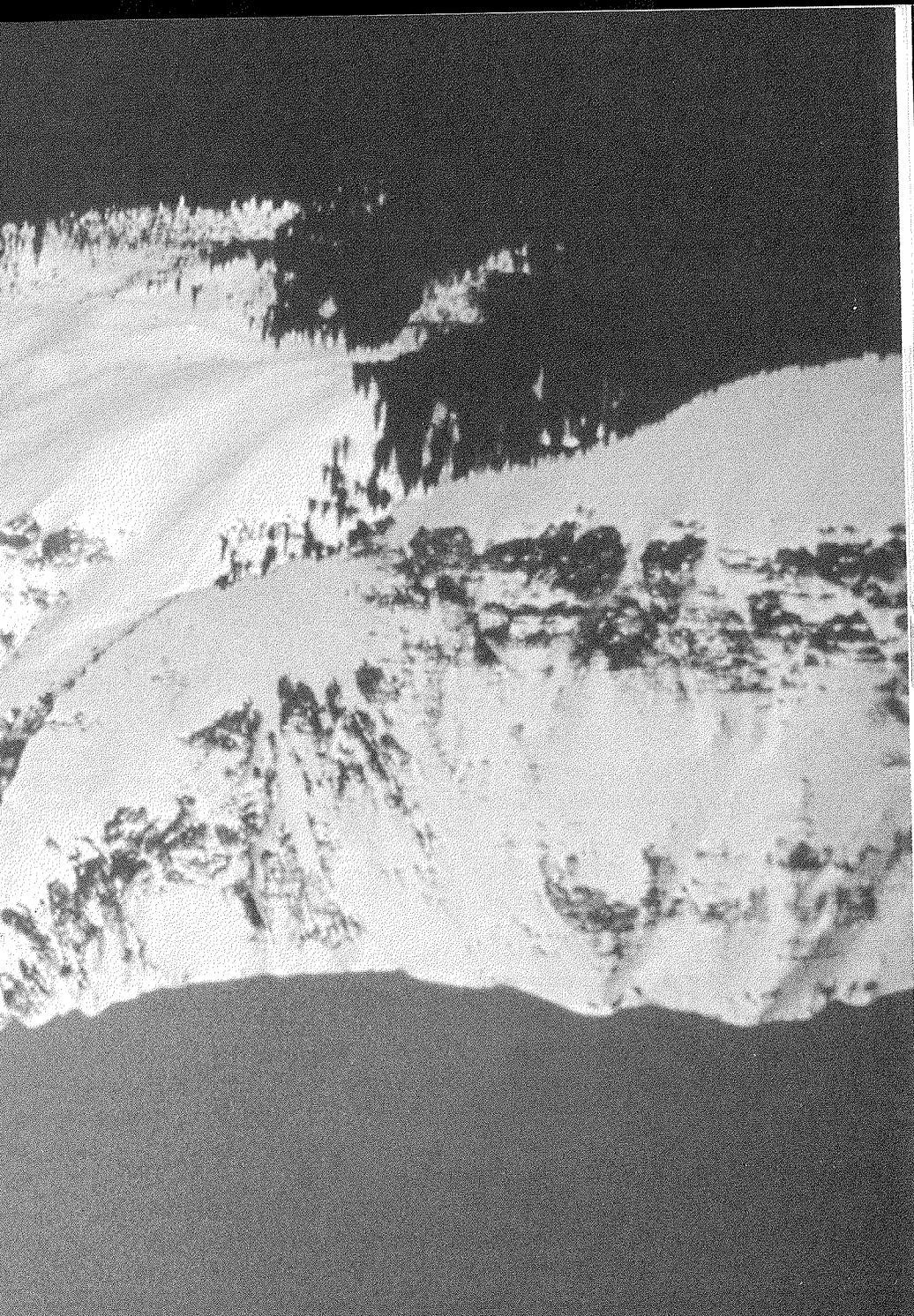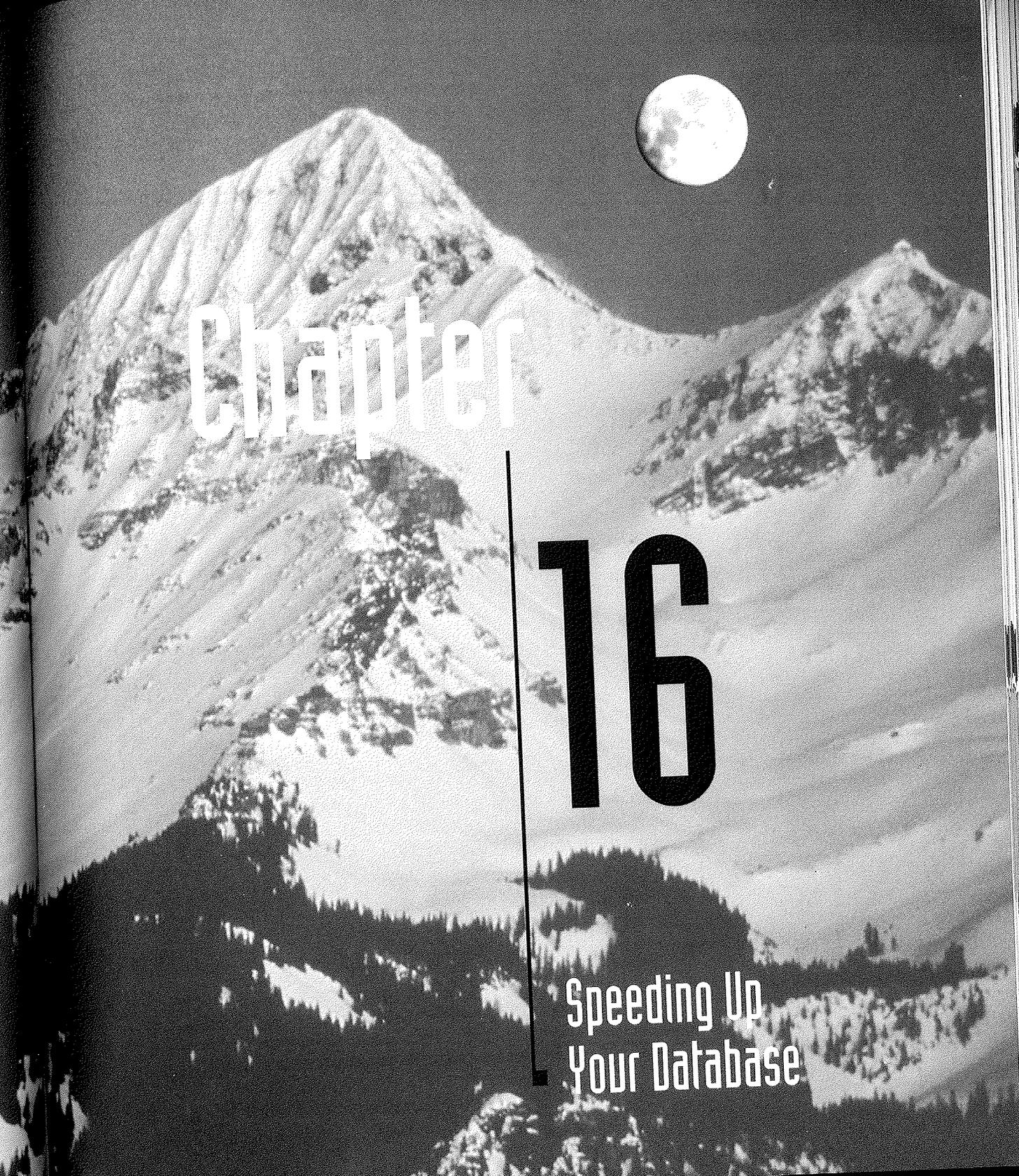
Chapter

16

Speeding Up Your Database
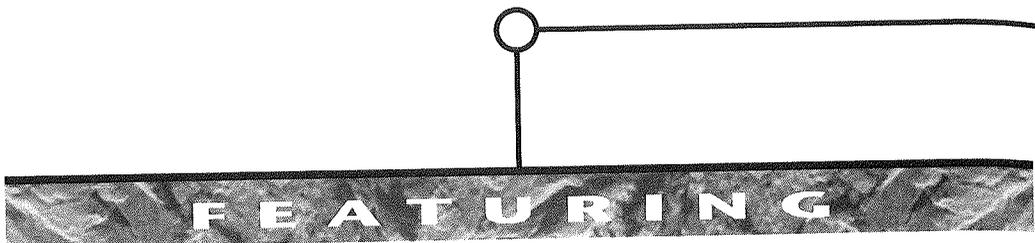
FEATURING

Speeding Up Your Database

If you're dreaming of a database that screams along at the speed of a Formula 1 Ferrari, but you're getting performance that's more like the plod, plod, plod of a desert tortoise, this chapter may be just what you're looking for. Here you'll find tips for tweaking that tired database engine so that it races swiftly along the information superhighway.

As you read this chapter, keep in mind that you can't make a Ferrari out of a Volkswagen Bug, or a Pentium out of an 80386. But you can squeeze the best possible performance out of the computer hardware you do have. If you're still hungry for speed after trying the suggestions in this chapter, you can always throw money at the problem and invest in faster, more expensive hardware.

For more tips on optimizing performance in a network environment, see Chapter 18.

So Where Do I Start?

For your convenience, we've divided this chapter into the five performance areas listed below:

- General Performance
- The Performance Analyzer

- Tables
- Queries
- Forms, Reports, and Printing

Start with the suggestions in the General Performance category and then work your way to the other categories if you notice sluggishness in those areas. Within each section below, we've arranged the tips in the general order that you should try them. So start at the top of each list of suggestions and work your way down to the bottom.

> **NOTE**
>
> The optimal settings in the categories that follow can vary with the type of computer hardware you're using to run Access. For best results, tweak one setting at a time, and monitor the performance after each change.

You can find out more about optimizing Access performance by searching for *Performance* with the help of the Office Assistant.

Speeding Up General Performance

Two basic methods are available to speed up general performance. First, you can make changes to general Windows 95 settings, which may also speed up many Windows applications, not just Access. Second, you can make changes through Access, which will speed up Access, but should have no effect on other Windows applications.

Tweaking Hardware and Windows 95 Settings

For best overall performance in Access and Windows, you should maximize the amount of memory and disk available as discussed below:

- **Increase the memory (RAM) on your computer.** Access requires at least 12MB of RAM, but the more RAM you buy and install, the better the performance. Don't use any of your RAM for a RAM disk.
- **Optimize Windows 95.** Windows 95 can report any system optimization problems to you. You should check this report in the System Properties dialog box and take any action recommended. You should also check a couple of settings available to you from this dialog box. To see the system performance report and check these settings, follow these steps:

    1. Open the Control Panel by selecting the Settings option on the Start menu and then select the Control Panel item.

2. Double-click on the System icon.
3. In the System Properties dialog box, click on the Performance tab and read the report within the Performance Status frame.
4. Click on the File System button and select the typical role for your machine using the drop-down list box on the Hard Drive tab in the File System Properties dialog box. Set read-ahead optimization to Full using the slider control. Click on OK.
5. Click on the Graphics button in the System Properties dialog box. Make sure the slider control for Hardware Acceleration in the Advanced Graphics Settings dialog box is set to Full, unless you are having problems with your display. In that case, you may wish to back off this setting a notch or two. The on-screen help will guide you in deciding where to leave this setting. Click on OK.
6. Click on OK in the System Properties dialog box to accept the settings. If you are prompted to restart Windows 95, click on Yes to do so.

- **Optimize memory usage.** In most cases, letting Windows 95 manage memory for you is the best idea. However, in two situations you may need to set your own virtual memory parameters. If you have only a little space on your default Windows 95 drive or if a different hard disk drive has a faster access time, you should tell Windows 95 to use a different drive for virtual memory. Follow these steps:

  1. Open the Control Panel by selecting the Settings option on the Start menu and then selecting the Control Panel item.
  2. Double-click on the System icon.
  3. Click on the Performance tab in the System Properties dialog box and then click on the Virtual Memory button. The dialog box will appear as shown in Figure 16.1.
  4. Select the Let Me Specify My Own Virtual Memory Settings option button. Then select the faster or less full drive using the Hard Disk drop-down list box. If you have a choice, opt for the fastest drive with at least 15MB of free space. Set a swap file size with a minimum size that, when added to the amount of system RAM, totals 25MB.
  5. Click on the OK button and then close the System Properties dialog box by clicking on its OK button.
  6. Click on Yes to restart Windows at the prompt. Restarting Windows makes the change in your swap file take effect.

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FIGURE 16.1

The Virtual
Memory
dialog box.
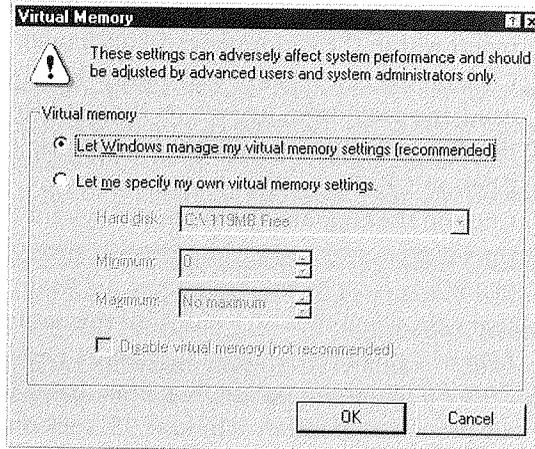
- **Close unneeded applications and TSRs.** You can make more memory available by closing applications and terminate-and-stay-resident (TSR) programs that you aren't using. Using DOS-based TSR programs can slow system performance because of shifts from protected mode into real mode to allow the TSR to run. To prevent TSR programs from running automatically when you start up your computer, delete the appropriate lines in autoexec.bat or convert them to comments by preceding the lines with a REM command, for example:

  ```
  Rem DOSKEY
  ```

- **Defragment your hard disk and compact your databases.** To speed disk performance and maximize the amount of free space available, you should periodically delete unnecessary files from your hard disk, defragment your hard disk with a "defrag" utility such as the Windows 95 Disk Defragmenter, and then compact your Access databases (see Chapter 17). You should also take these steps before optimizing the size of your Windows swap file, as discussed next. If you are using the Microsoft Plus! Pack for Windows 95, have the System Agent run ScanDisk and Disk Defragmenter nightly to keep your disk performance top notch.

- **Peel off that wallpaper.** If you have a full-screen (Tile) wallpaper bitmap on your Windows desktop, open Windows Control Panel and double-click on the Desktop icon. Now replace the wallpaper with a solid color or pattern bitmap or no bitmap at all. Depending on your video display, eliminating wallpaper can free up between 256K and 750K of RAM.

Tweaking General Access Settings

You can do the following in Access to improve performance:

- **Open single-user databases exclusively.** When opening databases that won't be shared with other users, select the Exclusive checkbox in the Open dialog box whenever possible. This setting tells Access not to spend time tracking multiuser record locking.
- **Store single-user databases and Access on the local hard disk.** Response will be faster if you install Access, and all databases that don't have to be shared, on your local hard disk drive, rather than on a network server.
- **Use indexes wisely.** Indexes can speed access to data, but they also can slow down record updating (see Chapter 6). For best results with indexes, you should:

  - Create only as many indexes as necessary.
  - Create indexes on fields that you frequently sort by.
  - Create indexes on fields that you frequently search by.
  - Include only the fields that are absolutely necessary in a multiple-field index. You should consider a multiple-field index only when you search or sort on a combination of fields. For example, if you frequently search for customers with a particular last name in a particular zip code, then a multiple-field index on these two fields will help performance.

- **Put only tables on the server for multiuser databases.** Keep all other objects on the local machine's drive. You can use the Database Splitter Wizard to separate the tables for storage on the server.
- **Experiment with record locking strategies.** You want a strategy that minimizes editing conflicts but allows appropriate access to the database. You must strike a balance between the performance penalties of multiple concurrent access and the inconvenience penalties of restrictive record locking.
- **Adjust parameters to avoid locking conflicts.** Experiment with the values of Refresh Interval, Update Retry Interval, Number of Update Retries, and ODBC Refresh Interval. To find these settings, open the Tools menu, select Options, and click on the Advanced tab.

NOTE

For more information on record-locking strategies, see Chapter 18.

Using the Performance Analyzer

Access 97 includes a Performance Analyzer. This tool examines your database objects and reports ways to improve their performance. The Performance Analyzer provides suggestions, recommendations, and ideas. The analyzer itself can perform suggestion and recommendation optimizations for you. Idea optimizations require that you work with Access's features yourself to perform the optimization.

> **NOTE**
>
> The Performance Analyzer can examine database objects only. It cannot provide information about how to speed up Access itself or the underlying operating system.

To show you what the Performance Analyzer can do, we've used it to analyze a database created to hold names, addresses, and similar information for a nonprofit corporation. Figure 16.2 shows the results. As you can tell, the Performance Analyzer has provided several tips for improving the speed even of this relatively simple database.

FIGURE 16.2

Using the Performance Analyzer on a simple database.
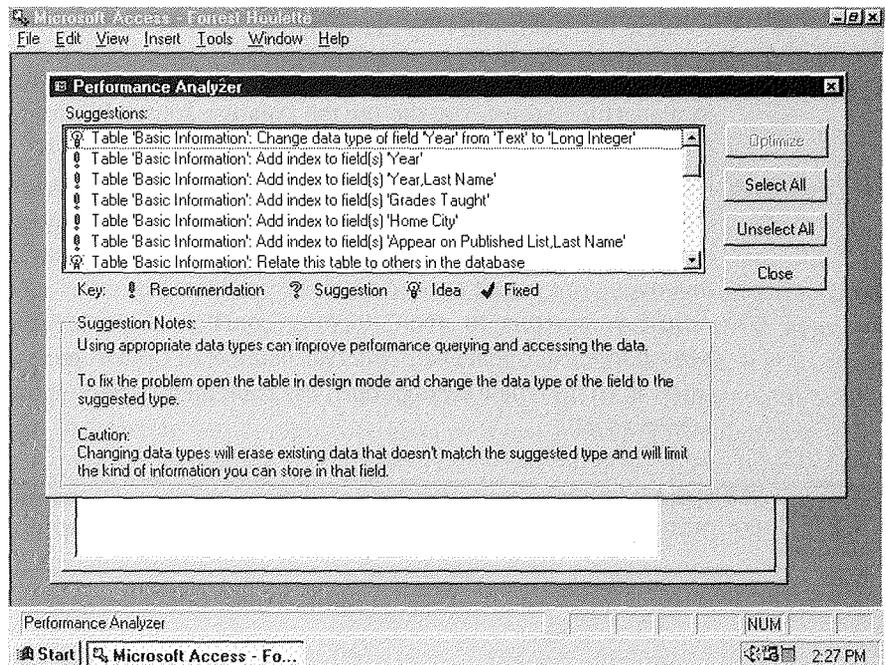
To use the Performance Analyzer, follow these steps:

1. Open the database you want to analyze.

> **TIP**
>
> Put a reasonable amount of data in your tables before running the Performance Analyzer. The query analysis step in particular takes into account the actual amount of data in each table.

2. Select Analyze from the Tools menu and then select Performance from the cascading menu.

3. Click the tab in the Performance Analyzer dialog box for the type of object you would like to analyze. Then select each object you want to include in the analysis. You can either click the checkbox that precedes an object or click the object's name and then click Select. Use Select All or Deselect All for quick ways to select or deselect the entire list of names on an individual tab.

4. Repeat step 3 until you have selected all the objects you want to optimize.

5. Click on the OK button. The Performance Analyzer displays dialog boxes that tell you which objects it is analyzing. It then displays a list of Suggestions, Recommendations, and Ideas.

6. Select Suggestion or Recommendation in the Suggestions list box and click on the Optimize button. Or to implement an Idea, open the appropriate table, query, form, report, macro, or module and make the change recommended.

> **TIP**
>
> You can select the All tab to see a list of all database objects. Then use the Select All and Unselect All buttons to speed the process of selecting items.

Speeding Up Tables

If you follow these techniques, you can design tables that operate in the most efficient manner possible. Access even provides help for improving tables in the form of the Table Analyzer Wizard.

- **Avoid redundant data.** Repeated data makes table access inefficient. Use the Table Analyzer Wizard to avoid common problems with tables. Select Analyze ➤ Table from the Tools menu and follow the directions provided by the Wizard.

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- **Select appropriate data types for your fields.** Choosing text where a number would be better, for example, can increase the size of your tables and make join operations less efficient.
- **Build indexes for fields that will be searched, joined, or have criteria set.** Creating the indexes makes queries faster on the table.

Speeding Up Queries

Microsoft Access uses a special data-access technology known as "Rushmore" to optimize queries automatically whenever possible. You can help Access do the job more efficiently by following the guidelines below. (See Chapter 10 for more about queries.)

- **Use and display only the fields you need.** Include only the fields you need in a query. Clear the Show box in fields used as selection criteria if you don't need to display those fields in the query result.
- **Use sorting wisely.** Sorting can slow down performance, especially when you sort on nonindexed fields.
- **Use Make Table queries for static data.** If you frequently need to base reports or analyses on data that doesn't change often, it's more efficient to run Make Table queries to create tables of selected (or calculated) data. Then you can view or report on the new tables without running a query each time. If your data does change, you can run the Make Table queries again to re-create the static tables. Note that this technique does involve trade-offs: First, it uses extra disk space to hold the static tables. And second, if you forget to run the Make Table query after data changes, you won't get up-to-date information.
- **Use queries only when necessary.** Response will be faster if you base forms, reports, and other queries on tables (such as those created by Make Table queries), rather than a query. Queries will, of course, be necessary if you need to pull information from several different tables that change often, or if you need to sort the data on a form or report.
- **Create queries that can be optimized.** For faster performance, avoid using restrictive query criteria (AND, OR, and NOT) on calculated and nonindexed columns. You can also speed up queries by using the Between... And, In, and = (equal) operators on indexed columns.
- **Avoid using domain aggregate functions.** Domain aggregate functions, such as DLookup, can slow down processing because these functions must look up data in tables that aren't included in the query. If you need to include data from another table, it's best to add the table to the query or to create a subquery. (To learn about subqueries, search for *Subqueries* in Help.)

- **Use fixed column headings in Crosstab queries.** Response will be quicker if you use fixed column headings in Crosstab queries whenever possible. To specify fixed column headings, go to query design view, choose View ➤ Properties, click on an empty part of the tables area, and type the headings into the Column Headings property box (separated by commas), like this:

  ```
  "Qtr1","Qtr2","Qtr3","Qtr4"
  ```

For more information about optimizing queries, search for *Optimizing Queries* or *Rushmore Technology* with the Office Assistant. (You can actually omit the second word of the *Rushmore* search and get the same results.)

Speeding Up Forms, Reports, and Printing

The following tips can speed up your forms, reports, and printing. (See Chapters 11 through 14 for more about designing forms and reports and creating graphs.)

- **Use Data Entry mode to add records to large tables.** When adding new records in forms or datasheets that have many existing records, choose Records ➤ Data Entry to hide existing records while you add new ones. This is faster than moving to the blank record that follows the last record. To view all the records again, choose Records ➤ Remove Filter/Sort.
- **Use hyperlinks instead of command buttons** to perform tasks such as opening forms. Database forms and reports are created without a VBA module in Access 97. (Objects created with older versions of Access always included a VBA module.) Consequently, forms and reports load more quickly when they don't have VBA code attached. Since command buttons have VBA code attached, you can increase system efficiency by using hyperlinks whenever you can.
- **Use pictures instead of OLE objects.** If you don't need to update OLE Paintbrush objects, Graphs, and other embedded objects, convert them to pictures. To do this, go to form or report design view, right-click on the object, and choose Object ➤ Convert. In the Convert dialog box, select Picture in the list box and click on OK.
- **Be stingy with bitmaps and other graphics on forms.** Bitmap and other graphic objects (such as lines, bordered fields, and opaque fields) can slow the form's opening and printing time. And color bitmaps will be slower than black-and-white bitmaps. Of course, the very things that make forms more attractive and fun to use also slow down their performance. So you'll need to decide whether the trade-off of speed for aesthetics is worthwhile.
- **Close forms when you're not using them** to free up memory.

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- **Avoid sorting and grouping on expressions.** Reports will be faster if you avoid unnecessary sorting and grouping on calculated expressions.
- **Avoid overlapping controls on forms and reports.** These controls take more time to display.
- **Use imported tables rather than attached tables.** If your forms include list boxes or combo boxes based on unchanging tables in another database, import those tables rather than attaching them to your database (Chapter 7). Imported tables will take up more disk space than attached tables, but processing will be faster.
- **Use fast printing techniques.** For faster printing of reports and forms, try these tips:
    - If you plan to print a form or report with a laser printer, open the form or report in design view, and choose Edit ➤ Select Form or Edit ➤ Select Report. Open the property sheet (View ➤ Properties), select Other Properties from the drop-down list, and set Fast Laser Printing to Yes. (Yes is the default setting for this property.)

NOTE

If you have an older laser printer, or need to print overlapping graphic items correctly, you'll need to leave Fast Laser Printing set to No.

    - Print in Portrait orientation where possible. Landscape printing can be slower, especially when printing many horizontal lines on nonlaser printers.

- **Convert a database application into an MDE file.** This new feature in Access 97 lets you save a database without its source code in a compact format, which results in better performance when the database is used. However, users cannot view or edit source code. See Chapter 28 for details on creating an MDE file from a database or search for *MDE* with the Office Assistant.

Where to Go from Here

Improving the performance of your database applications makes users happy. They receive zippy response when they are working with the data. Once you have created a high-performance database application, however, you have to make it available to users. To do so, you have to know how to administer a database, which is the topic of the next chapter.

What's New in the Access Zoo?

We've just taken a look at many of the features you can use to improve the performance of Access 97 for Windows 95. Other new features in this version that make Access run more quickly are

- Forms and reports are now created as "lightweight" objects that don't include Visual Basic modules. These streamlined objects load more quickly than their old counterparts. You are still free to add code to these objects if you need to.

- The Database Wizard creates lightweight forms whenever it can by using hyperlinks instead of VBA code for tasks like opening other forms.
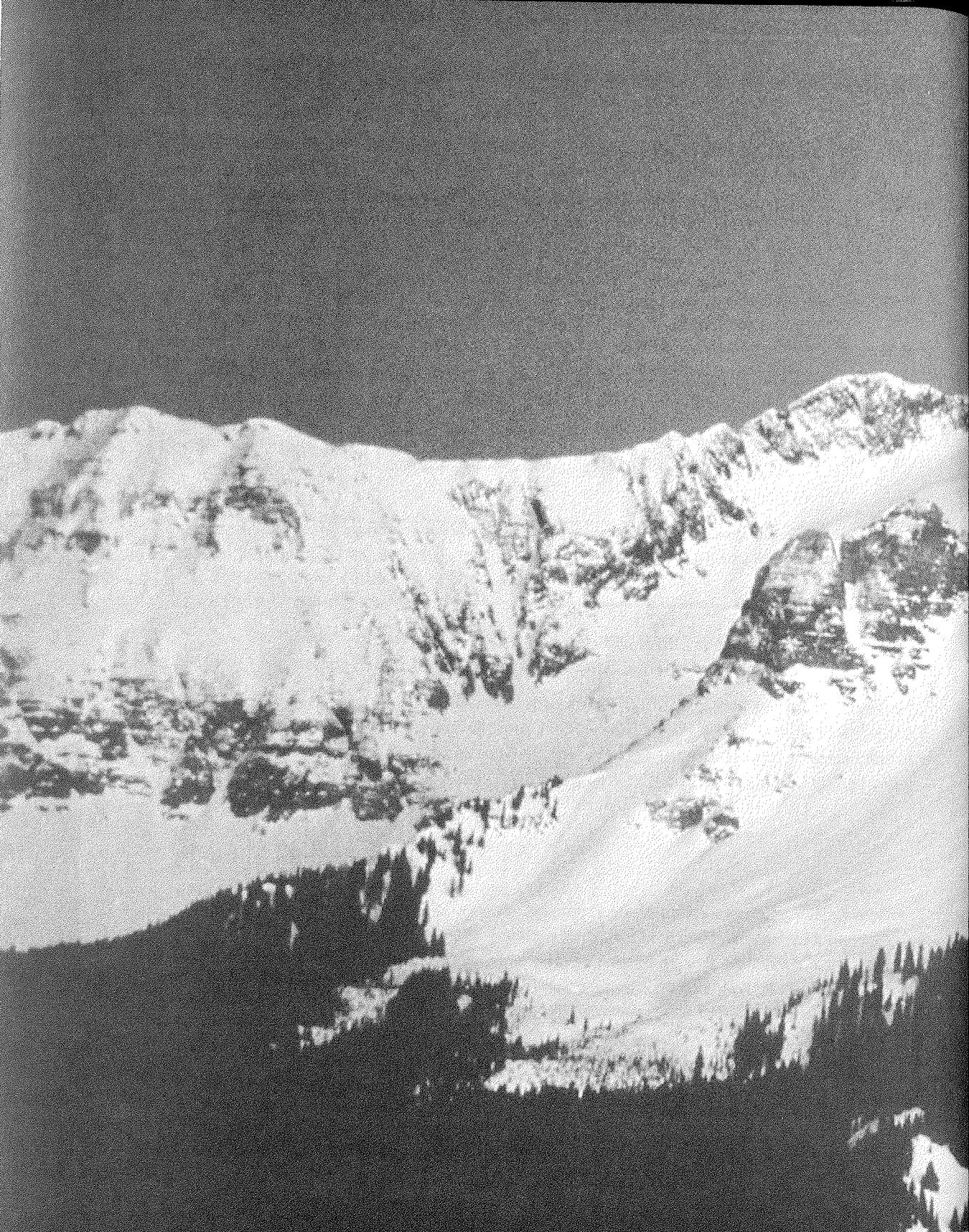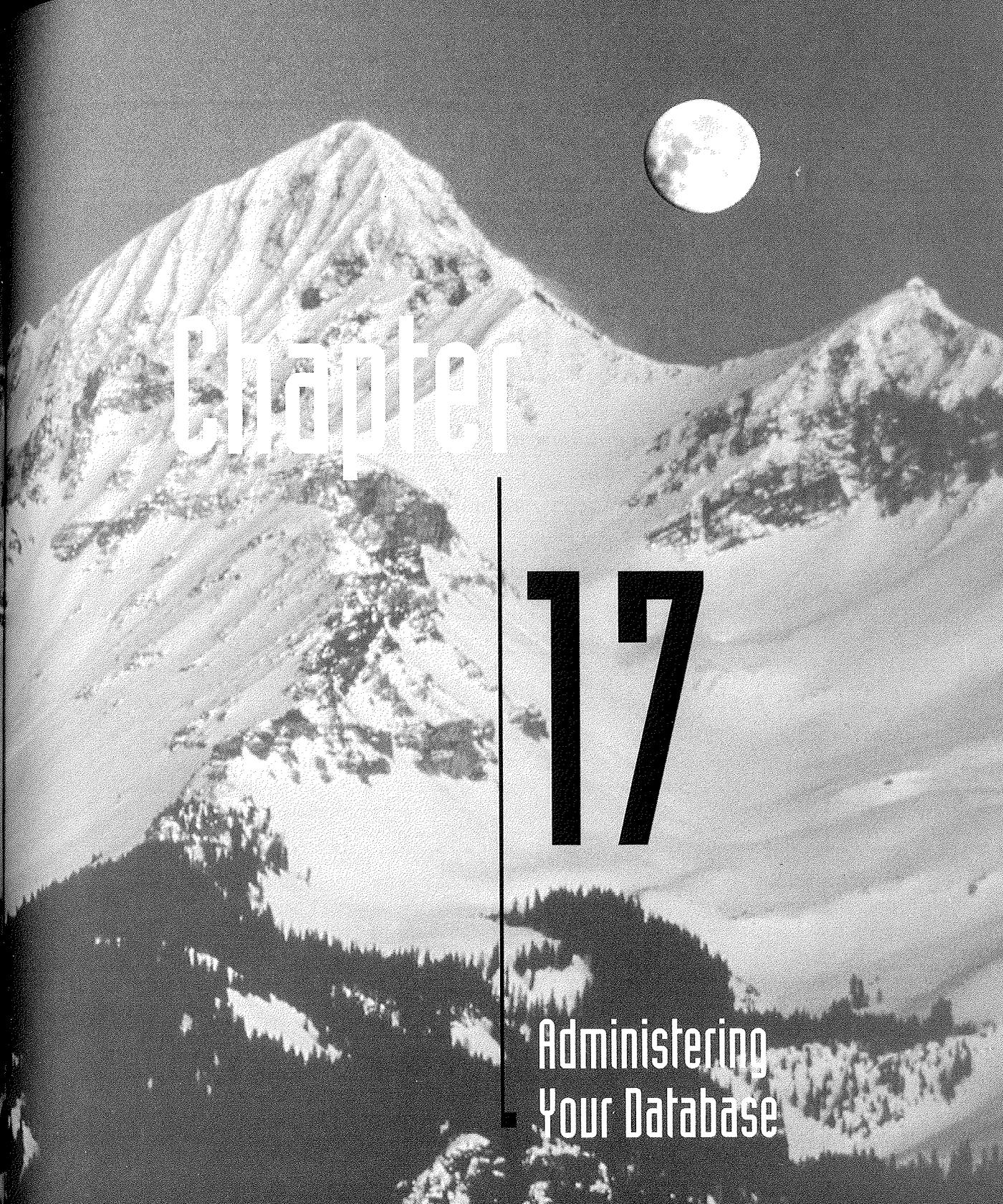
Chapter

17

Administering
Your Database
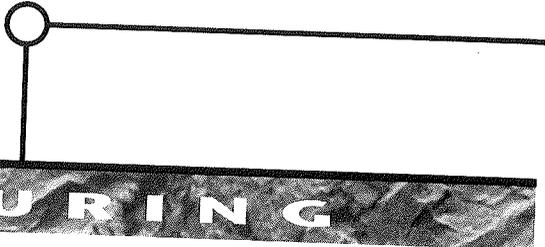
FEATURING

Administering Your Database

This chapter covers the mundane, yet essential, housekeeping tasks that fall into the category of *database administration*. Topics include how to back up, compact, convert, encrypt, decrypt, repair, replicate, and document the structure of your databases.

Many database administration tasks are optional, and you should feel free to pick and choose those that interest you most. However, the following section, "Backing Up a Database," is a must for anyone using Access on a single-user computer and for database administrators.

> **NOTE**
> The *database administrator* is the person who is responsible for maintaining the integrity and security of a database on a multiuser network (for example, making backups, compacting and repairing databases, protecting data from prying eyes). Database administration tasks are discussed in this chapter and in Chapter 18.

Backing Up a Database

Backing up your database is the cheapest and most effective way to ensure your data against disasters. For example, if your database structure becomes damaged due to an unexpected power loss, or your hard disk fails due to old age, flood, fire, or other catastrophe, your data can become unreadable and be irretrievably lost. This loss would be particularly disastrous with an Access database, since every object you create within a database is stored in one large database file! Up-to-date backups can save time, money, even your job—and they're easy to do. For maximum protection, store backups off-site, in a disaster-proof container.

> **NOTE**
>
> *Repairing* a damaged database is sometimes possible, as you'll learn later in the section "Repairing a Database." However, the best method of data protection is to make regular backups.

Exactly where you store your backups and how often you make them is up to you. If the database is small enough, you can back it up to a floppy. Or you can use a file compression program to create a compressed copy of the database and back that up to a floppy. For larger databases, you'll need to back up to a tape drive or perhaps a hard drive with removable disks.

You may also want to keep a second backup copy of the database on your local hard disk. That way, if you make a change to the original database that somehow corrupts the original, you can quickly copy the local backup to the original file name without bothering with external drives or tape devices.

Backing up a database is basically a matter of copying two crucial files to the backup device:

- **The database file**   This file stores all your data and database objects and usually has the extension .mdb.
- **The system.mdw workgroup database file**   The Setup program creates system.mdw in the \access folder automatically. This file contains important information about each user's toolbar and option settings. It also stores workgroup security information. (A *workgroup* is a group of users who share data and the same system database file.)

> **WARNING**
>
> If the system.mdw file is lost or damaged, you won't be able to start Access. If you can't restore this file from a backup copy, you'll need to reinstall Access (see Appendix A) and set up any toolbars, option settings, and security again.

To create a database backup, follow the steps below:

1. Close any open database by choosing File ➤ Close Database.
2. Make sure all other users also close the database so that no open copies are on the system. (Database administrators: You may prefer to make backups in the wee hours of the morning so that network users don't have to spend time twiddling their thumbs while you churn out database backups.)

> **TIP**
>
> You can also back up individual database objects by creating a database and then importing the objects from the original database to the copy (see Chapter 7). The advantage of this approach is that users do not have to close the database first.

3. Switch to whatever program you use to make backups. This can be the Windows Explorer, the Copy command available in the MS-DOS window, the Windows 95 Backup program, a tape drive system, or some other backup utility.
4. Copy the .mdb file to the backup destination of your choosing.
5. Copy the workgroup file to the backup destination. If you haven't set up a custom workgroup, this will be the system.mdw file from your Access directory. See Chapter 18 for information about setting up a custom workgroup file.

Restoring a Database from Backups

To restore the database from a backup copy, use your backup software to copy the .mdb file from your backup device to the appropriate database file in the database folder. If the file system.mdw was lost or damaged, copy that file from the backup device to the \access folder.

> **WARNING**
>
> If the backup database and the original database have the same names, you'll be *replacing* the original file. If you want to keep the original file for some reason, rename the file before restoring the backup copy to your hard disk.

For more information about making backups, search for *Backup* and *System.mdw* with the Office Assistant. Also consult the documentation that comes with your backup program.

PART

III

Database Tuning and Administration

Compacting a Database

As you add and delete records, macros, tables, and other objects in your database, the hard disk space formerly occupied by deleted objects can become fragmented into many small pieces that can't be used efficiently. This fragmentation, in turn, can slow down system performance to a sluggish pace and waste valuable disk space. The solution is to compact your databases periodically. *Compacting* reorganizes the space occupied by an Access database and can recover wasted space so that your system can perform better.

Before compacting a database, consider the following points:

- Because Access must copy the entire database during compacting, it will need as much available disk space as the database itself requires. You can check the size of the database and the available disk space with the Windows File Manager.
- To compact a database, you must have Modify Design permission for all tables in the database. Permissions are discussed in Chapter 18.
- The database must be closed when you compact it. You must check to make certain no one on your network is using the database before you attempt to compact it. If anyone has it open, the operation will fail.
- When you compact that table's database, if you've deleted records from the end of a table that has an AutoNumber field, Access will reset the next counter number to one more than the last undeleted counter number.

To compact the database:

1. Choose File ➤ Close if the database you want to compact is open. (Any users on the network must also close that database.)
2. Choose Tools ➤ Database Utilities ➤ Compact Database.
3. Choose the drive, folder, and file name of the database that you want to compact from the Database To Compact From dialog box and then select the Compact button.
4. Select the database for compacting from the list box in the Compact Database Into dialog box or type a valid file name for the compacted database in the File Name text box. Next choose Save. Or if you want to compact into the same database, double-click on the database name in the list box. If you use the same name in steps 3 and 4, Access will ask for permission to replace the original with the copy. (Choose Yes if you want to replace the existing file, or No if you want to specify a different name.)

Access will compact the database, displaying a progress message along the status bar as it does so.

NOTE

To maintain optimum performance in your database, you must either compact it using its original name or rename it with its original name after compacting.

Compacting Other Areas of Your Hard Disk

As mentioned, a fragmented database can slow down Access performance. Likewise, a badly fragmented hard disk, or one that is low on free space, can slow down *all* the applications on your computer, including both Windows 95 and Access. In addition to compacting your databases, as described here, you should also defragment your hard disk periodically and make sure that your hard disk has plenty of free space available.

To perform this task, you can use the Disk Defragmenter provided with Windows 95 (select Start ➤ Programs ➤ Accessories ➤ System Tools ➤ Disk Defragmenter) or a defragmenter provided by another vendor. Most such tools work the same way. Select the drive you want to defragment, click on OK, and then take a coffee break while the defragmenter does its work.

If you have the Microsoft Plus! Pack for Windows 95, you can use the System Agent to schedule the Disk Defragmenter to run on a periodic basis. We suggest scheduling it to run nightly to keep your disk working at top speed.

WARNING

You cannot use Disk Defragmenter to defragment a network disk, a CD, or a disk compressed with a compression program not supported by Windows 95.

For more information about compacting databases, search for *Compacting Databases* with the Office Assistant. For more about the Disk Defragmenter, search for *Defragmenter* in Windows Help.

Converting from Other Access Formats

If you've upgraded to Access 97, you can use the new version to work with databases created under Access 1.*x*, Access 2.0, and Access95 without going through any special conversion. However, before you can change the *structure* of any tables, modify the design of any objects, or add or remove database objects in an old database, you must convert that database to Access 97 format.

PART

III

Database Tuning and
Administration

> **WARNING**
> You may not want to convert a database to Access 97 format. You may need to share such databases with users who have not upgraded or cannot upgrade to Access 97. If you convert, such users will not be able to access the data. In addition, you should not convert databases accessed by applications created using Visual Basic 3.0 or 2.0 unless they are recompiled. Such applications need to be recompiled using Visual Basic 4.0 before they can be converted. The structure of the Data Access Objects has changed slightly in Access 97 and Visual Basic 4.0.

To convert a database to Access 97:

1. Choose File ➤ Close if the database you want to convert is open. (Any users on the network must also close that database.)
2. Use the Explorer to make a backup copy of the database. Make certain that all linked tables are still located in the folder that the database refers to.
3. Choose Tools ➤ Database Utilities ➤ Convert Database. If you are converting a secured database, you must have Open/Run, Open Exclusive, Modify Design, Administer, and Read Design permissions.
4. Choose the drive, folder, and file name of the database that you want to convert from the Database To Convert From dialog box, then select the Convert button.
5. Select the database to convert in the list box from the Convert Database Into dialog box or type in a valid file name for the converted database in the File Name text box. Next choose Save. If you use the same name in steps 4 and 5, Access will ask for permission to replace the original with the converted copy. (Choose Yes if you want to replace the existing file; choose No if you want to specify a different name.)

> **TIP**
> Access 1.*x* objects that contain a back-quote character (') in their names will not convert. You must rename such objects using the version of Access in which they were created before you can convert them.

When Access converts a database, it constructs a special table called the ConvertErrors table. This table contains information about any validation rules that would not convert to Access 97. The ConvertErrors table contains fields describing the error, naming the field where it occurred, naming the table where it occurred, naming the table property containing the problem, and naming the value that would not convert. You can use this information to rewrite validation rules as necessary so that your database can function as it did before the conversion. In general, you will find yourself having to update user-defined functions; domain aggregate functions; totals functions; references to fields; and references to forms, queries, and tables.

Encrypting and Decrypting Your Database

You can *encrypt* a database to ensure that the database can be opened and viewed only in Access. Though encryption doesn't prevent another Access user from tampering with the database, it does prevent anyone from using another application (such as a word processor or utility) to inspect data in the database. Encryption is recommended if you plan to send a copy of a database to another Access user or to an off-site storage location.

> **TIP**
>
> You can use encryption/decryption in conjunction with the Access security features discussed in Chapter 18 and any security that your network software provides.

Decrypting reverses the encryption process. While you *can* open an encrypted database without decrypting it first, the database will be 10 to 15 percent slower in its encrypted state. Therefore, if you receive a copy of an encrypted database from another Access user, you probably should decrypt it before you start using it.

The following points apply to database encryption and decryption:

- Access automatically determines whether the database is encrypted. If the database isn't encrypted, Access encrypts it. If the database is already encrypted, Access decrypts it.
- The hard disk must have enough space available to store both the original database and the temporary copy that Access creates during encryption/decryption.
- The database must be closed when you encrypt or decrypt it. If anyone has it open, the operation will fail.

To encrypt or decrypt a database:

1. Choose File ➤ Close if the database you want to encrypt or decrypt is currently open. In a multiuser environment, all other users must also close the database. You must have Modify Design permission to encrypt or decrypt a secure database if user-level security is in force.
2. Choose Tools ➤ Security ➤ Encrypt/Decrypt Database.
3. Choose the name of the database you want to encrypt or decrypt from the Encrypt/Decrypt Database dialog box and then choose OK.
4. Type in a valid file name for the encrypted (or decrypted) database in the Encrypt Database As (or Decrypt Database As) dialog box and choose Save. Or if you want to encrypt/decrypt into the same database, double-click on the database name in the list box. If you use the same name in steps 3 and 4, Access will ask for permission to replace the original with the copy. (Choose Yes if you want to replace the existing file, or No if you want to specify a different name.)

For more information about encrypting and decrypting databases, search for *Encrypt* or *Decrypt* with the Office Assistant.

> **TIP**
>
> Just as they will not convert, Access 1.*x* objects that contain a backquote character (') in their names will not encrypt. You must rename such objects, using the version of Access in which they were created, before you can encrypt them.

Repairing a Damaged Database

Before turning off your computer, you should always exit Access properly by choosing File ➤ Exit. Proper shutdown ensures that all your database objects are saved to disk and prevents damage to your database.

If a power outage or some other mishap occurs, some data might not be saved and your open database could be damaged. In most cases, Access can detect the damage automatically whenever you try to open, compact, encrypt, or decrypt the damaged database, and it will ask for permission to repair it. Simply choose OK when asked if you want to begin the repair process.

Occasionally, however, Access might be unable to detect the problem, and the database may behave strangely. In such a case, you can use the Repair Database command to fix the corrupted database. Here's how:

1. Close any open databases using File ➤ Close. As usual, any users on the network must also close the database.
2. Use the Explorer to make a backup copy of the database.
3. Choose Tools ➤ Database Utilities ➤ Repair Database.
4. Choose the drive, folder, and name of the database you want to repair, then choose Repair.

Once the repair is done, choose OK to clear the message that appears. You should now be able to open the database with the usual File ➤ Open Database commands.

If you were editing data when Access shut down unexpectedly, your last change may be lost after you repair the database. Return to the form or datasheet you were working with; if necessary, reenter your changes. Also check any other objects you were working on when the system shut down and redo any changes that didn't make it into the database.

When Repair Doesn't Solve the Problem

Sometimes hard disk errors will prevent Access from repairing the database properly, or they may prevent Access from running at all. For these types of problems, you'll first need to run a hard disk repair utility (such as ScanDisk, which comes with Windows 95). Then try running Access and repairing the database again. If Access won't run at all, you'll need to reinstall it with the Setup program, as explained in Appendix A. If you can't repair the database satisfactorily, you must restore it from a backup copy.

You can find online information about repairing databases by searching for *Repair* with the Office Assistant. To learn about ScanDisk, search Windows 95 Help for *ScanDisk*.

Viewing Information about Your Database

Once you have created a database of objects, you may want to review the attributes of those objects from time to time. Access provides you two means of examining the properties associated with objects in a database. First, you can click on any object in the Database window and then select Properties from the View menu. This action opens a Properties dialog box like the one shown in Figure 17.1. This dialog box tells you what the object is, when it was created, when it was last modified, who owns it, and whether it has the hidden or replicated attributes. You can enter further documentation into the Description text box if you desire to do so. In this way, you can store a description of each object in the database.

FIGURE 17.1

The Properties dialog box for a table appears when you choose View ➤ Properties.

Database Tuning and Administration
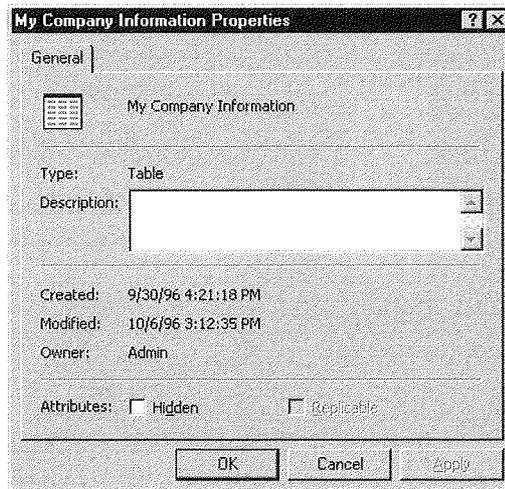
You can also view information about the database in general, as well as store additional information that documents the database and helps you to locate it. To view this information, select File ➤ Database Properties. The properties dialog box shown in Figure 17.2 appears. The General tab displays the attributes of the database file. The Contents tab provides a list of all the objects in the database. The Statistics tab provides some summary information about how the database has been used.

The most useful tabs, however, are the Summary and Custom tabs. The Summary tab allows you to record information about who created the database and who owns it. You can also enter a description on this tab, as well as keywords to aid in searching for the file. The Custom tab allows you to define special properties for the database that help in searching for the file if you cannot remember its file name. Use the Name drop-down combination box to enter a name for the property. Select a type from the Type drop-down list box. Then enter a value for the property in the Value text box. To add to the list of custom properties for the database select the Add button. You can use the Summary and Custom tabs to record a lot of information that documents your database. You can also search for a database file using the summary information and custom properties called up by choosing the Advanced button in any file dialog box.

FIGURE 17.2

The Properties dialog box for an entire database.
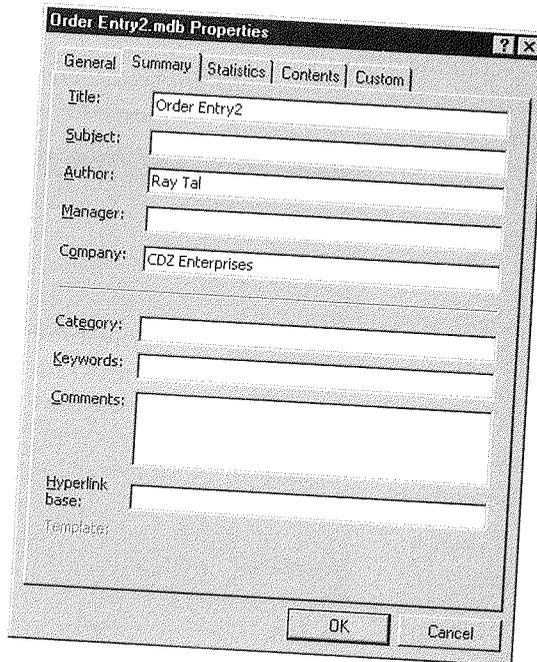
Documenting Your Database

When developing applications or sharing your database with other users, a helpful step is to include documentation about the various design elements in the database objects. For instance, you can preview or print a report of the properties, code, and permissions associated with controls on a form or report. Access makes it easy to produce database documentation for a single object, or for several objects at once.

To document an object or a set of objects, follow these steps:

1. Choose Tools ➤ Analyze ➤ Documenter. You'll see a Documenter dialog box, as in Figure 17.3.

> **TIP**
>
> The Documenter does not usually install when you install Access. You may have to install it using the Add/Remove Programs icon in the Control Panel.

FIGURE 17.3

The Documenter dialog box lets you choose which information to include in the object definition report.

PART

III

Database Tuning and Administration
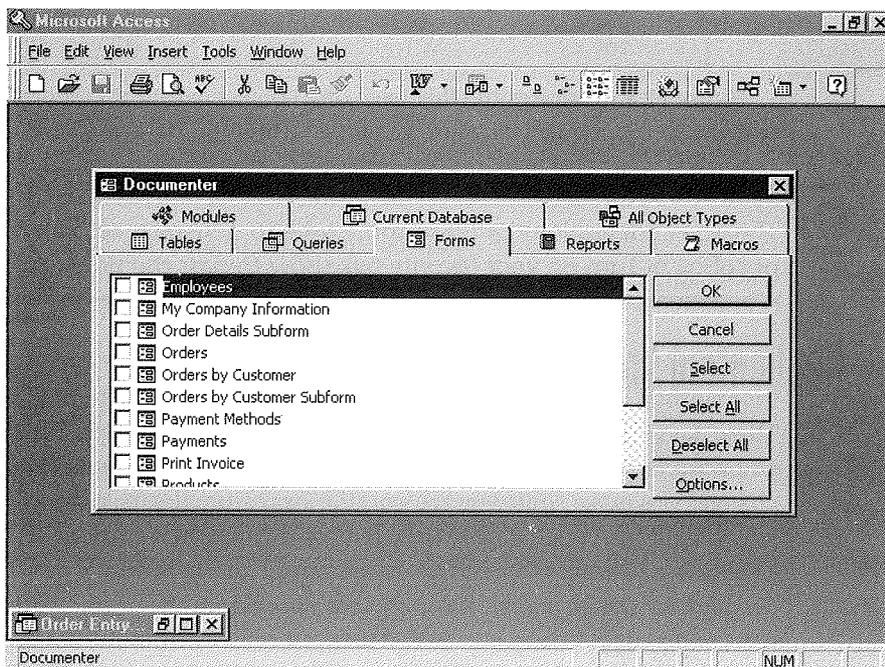
2. Select the tab for the type of object you want to document. (Choose All Object Types to document the entire database.) Select the specific objects you want to document by clicking on their checkboxes. Use the Select All and Deselect All buttons to simplify this process.

3. (Optional) Click on the Options button if you'd like to select which properties are documented for an object, then select any properties you want by using the option buttons presented, and click on OK.

4. Choose OK to generate the object definition. After a few moments, the Object Definition report appears in a print preview window.

5. Do any of the following:

   • To view the report, scroll through or zoom out or in as you would in any print preview window.
   • To print the report, click on the Print toolbar button or choose File ➤ Print.
   • To save the report as a table or as an external file, choose File ➤ Save As Table or File ➤ Output To. If you choose the former, Access 97 will create a table called Object Definition. If you use Output To, choose a file format (HTML, Microsoft Excel, MS-DOS Text, or Rich Text Format) and choose OK. Enter a name in the Output To dialog box and click on OK.

6. Click on the Close Window toolbar button or choose File ➤ Close.

Figure 17.4 illustrates the first page of an object definition report for the Customers table in an order entry database generated using the Database Wizard.

WARNING

The object definitions can take some time to generate, so be patient. Grab a cup of coffee or turn on your favorite talk show to pass the time.

Replicating Your Database

These days almost everyone takes work with them on the road. What do you do when you want to take a copy of your database with you to work on? How do you manage changes you make while you are working away from the master copy? Access 97 allows you to replicate your database in its entirety or a selected portion. When it is replicated, the database contains special tables and properties that enable Access to distinguish between the *design master*, the copy that determines the overall structure of the database, and a copy. Changes in design take place only within the design master, and tools are available that allow you to synchronize all of the copies of the data.

An object defi-nition report's first page for the Customers table in an order entry database.
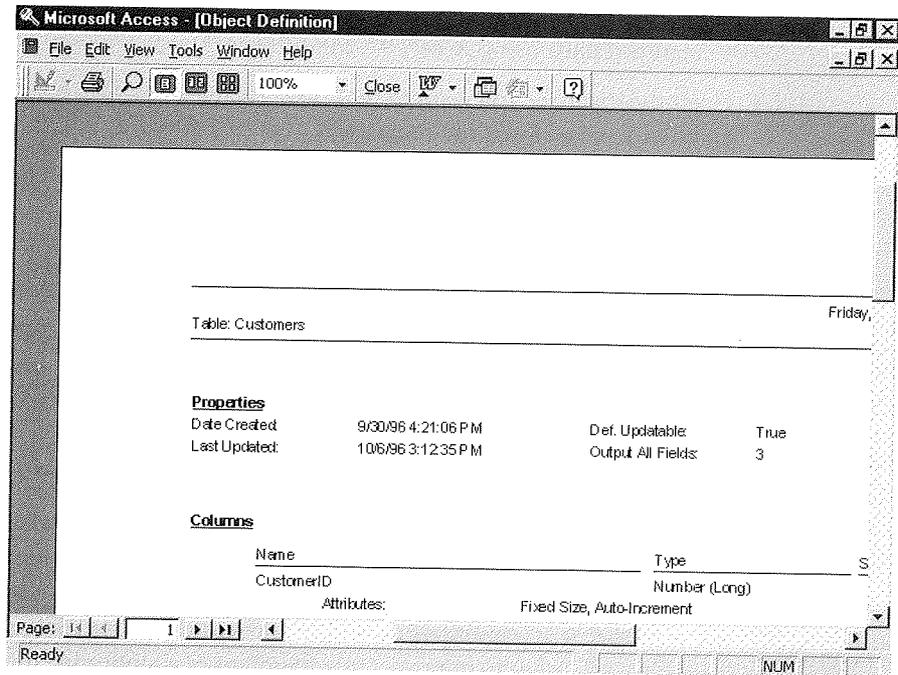
Creating a Replica

Replicas can be managed either through Access or the Windows 95 Briefcase. You always have a choice of which you prefer to use to create and synchronize your replicas. Before creating a replica, you need to take three steps:

1. Remove the database password using Tools ➤ Security ➤ Unset Database Password.

2. Be certain the Briefcase is installed. (If it is not, use the Add/Remove Programs icon in Control Panel to install it.)

3. Be certain that Briefcase Replication was installed with Access. (If not, visit the Control Panel again.)

NOTE
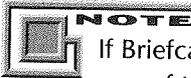
If Briefcase Replication is not installed, Access will present a dialog box informing you of this fact when you try to create a replica the first time.

PART

III

Database Tuning and Administration

Then open the Explorer and drag the database to the Briefcase. When you drop the database file on the Briefcase, Access automatically converts it for replication.

To create a replica using Access 97, follow these steps:

1. Open the database you want to replicate and make sure all users of the database on a network have closed the database.
2. Select Tools ➤ Replication ➤ Create Replica.
3. Choose Yes in the dialog box to close the database.
4. Choose either Yes or No in the next dialog box to make a backup of the database.
5. Use the file dialog box presented to select a location for the replica and click on OK.

> **WARNING**
>
> Converting to a replicable database is a one-way process. The only way to make it nonreplicable is to create a new database and import the data from one of the replicas.

You can make as many replicas of your design master as you wish. In fact, you can even make replicas from a replica. The total group of replicas you make is known as the *replica set* for the database. You add to the replica set by creating a new replica as described above. You remove replicas from the replica set by deleting the database file for the replica you want to remove. Only members of a replica set and their design master can synchronize their data.

Creating a Partial Replica

A partial replica includes a subset of the records in a database. For example, you might want to give a salesperson a replica of a database that includes records for their territory only. Neither the Access menu nor toolbar commands give you an easy way to create a partial replica, but you can create a partial replica with a VBA program.

For information on creating a partial replica, search for *Replicate* with Office Assistant and click on *Create Partial Replicas*.

Updating a Replica

How do you synchronize all of the changes made in your replica with the design master or with other replicas? The process is easy. Just follow these steps:

1. Open the Briefcase and select the database file.
2. Select Update Selection from the Briefcase menu. (You could also select Update All.)

The Briefcase then automatically merges the changes with the copy of the database, either design master or replica, available on your desktop computer. If you would rather manage synchronization from Access, follow these steps instead:

1. Open the database to synchronize.
2. Select Tools ➤ Replication ➤ Synchronize Now.
3. Select either the design master or another replica using the file dialog box and then choose OK.
4. Click on Yes when prompted to close the database.

If members of a replica set develop synchronization conflicts, Access prompts you to resolve them when you open the replica that has the conflicts. Selecting Resolve in this dialog box causes Access to lead you step by step through the process of conflict resolution. You are offered the chance to copy fields or delete the conflicting record in order to resolve conflicts.

You may encounter a situation in which you feel that a replica has been updated so significantly that you would rather have it as the design master. You can convert any member of a replica set into a design master using this procedure:

1. Open the replica that will become the new design master.
2. Select Tools ➤ Replication ➤ Synchronize Now.
3. Select the current design master using the File dialog box and check the *Make Filename the Design Master* checkbox. (Access fills in *Filename* with the name of the file you opened in step 1.)
4. Choose OK to create the new design master.

You might also encounter a situation in which a well-meaning user has deleted the design master. In this case choose the replica you want to use to replace the design master. Preferably this replica would be the most recently synchronized copy. Then synchronize this replica with as many others as you feel necessary to build an accurate master copy of the data. Finally, open the replica that will replace the design master and choose Tools ➤ Replication ➤ Recover Design Master. Click on the Yes button when Access prompts you to confirm that you have synchronized this replica with all others.

Where to Go from Here

You have just learned quite a bit about administering a database in either a single-user or a multiuser environment. In discussing administration, we have covered topics that imply that your database resides on a network. The next chapter deals more fully with the issues of networking and security and expands upon some of the issues dealt with briefly here.

What's New in the Access Zoo?

You've just taken a look at many of the features that make Access 97 for Windows 95 easy for database administrators to use. These features include

- The ability to replicate a database so that multiple users can work with copies of the data

- The ability to convert Access 1.x, 2.0, and Access 95 databases to the Access 97 for Windows 95 format.

- Assistance with documenting your databases.
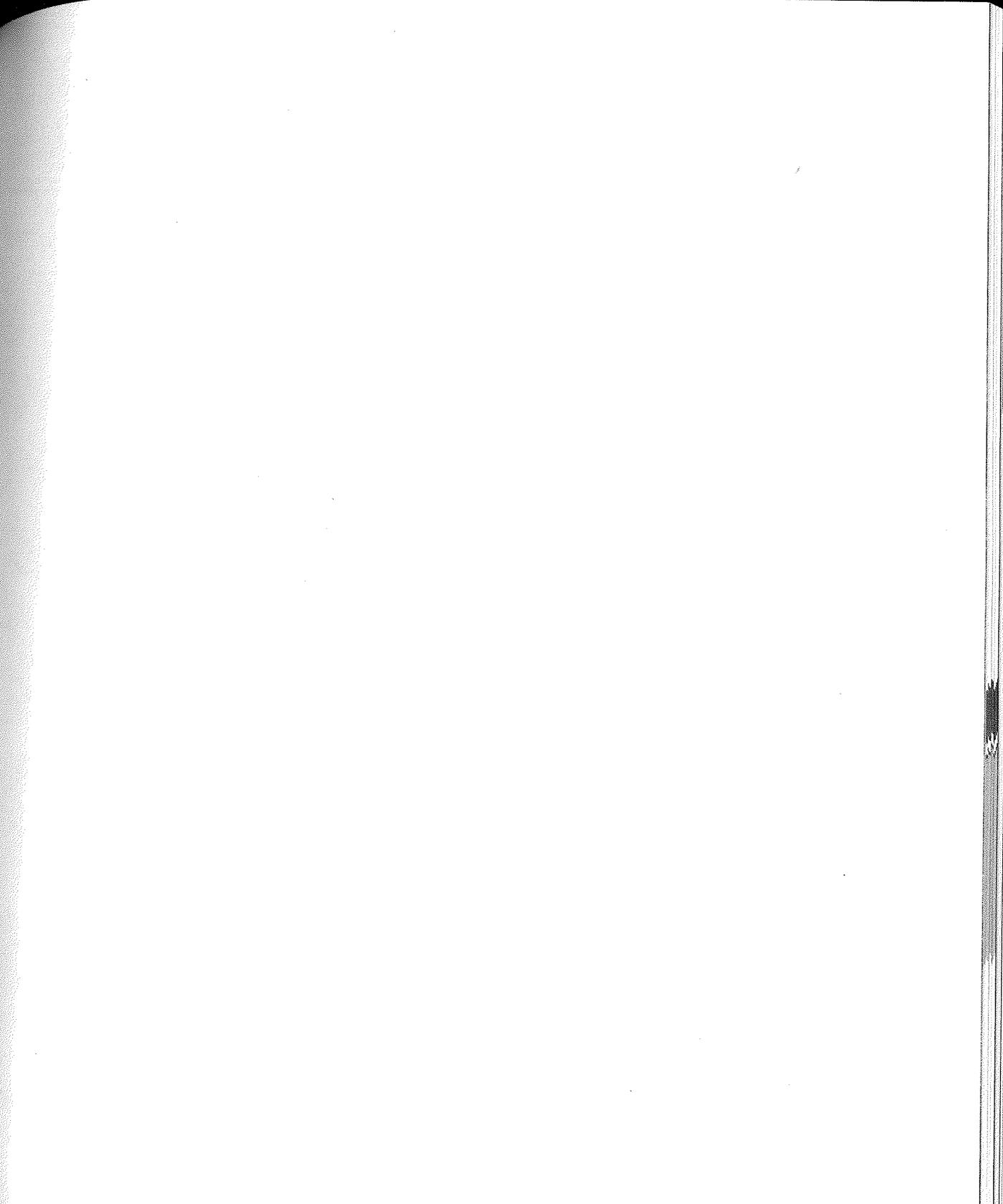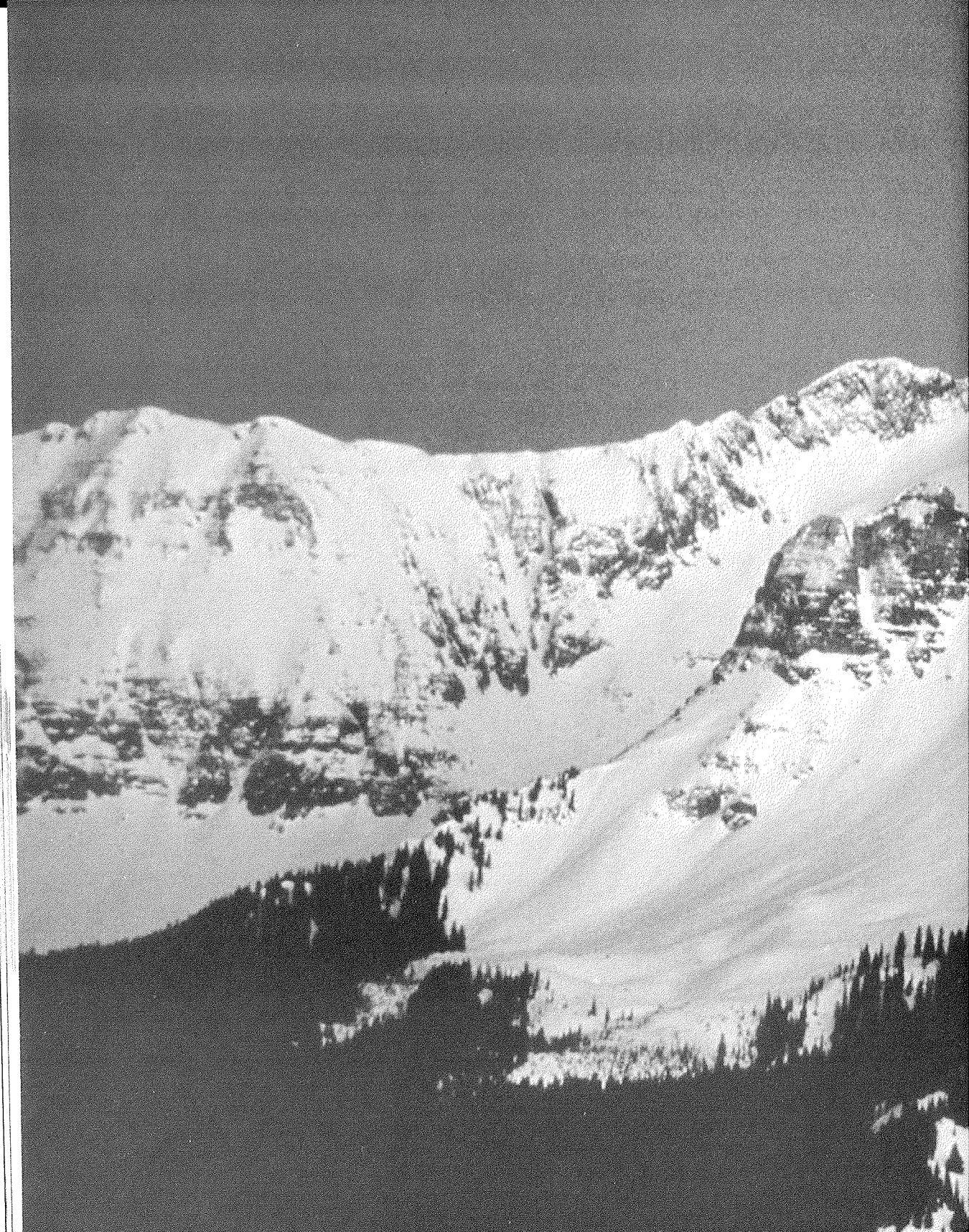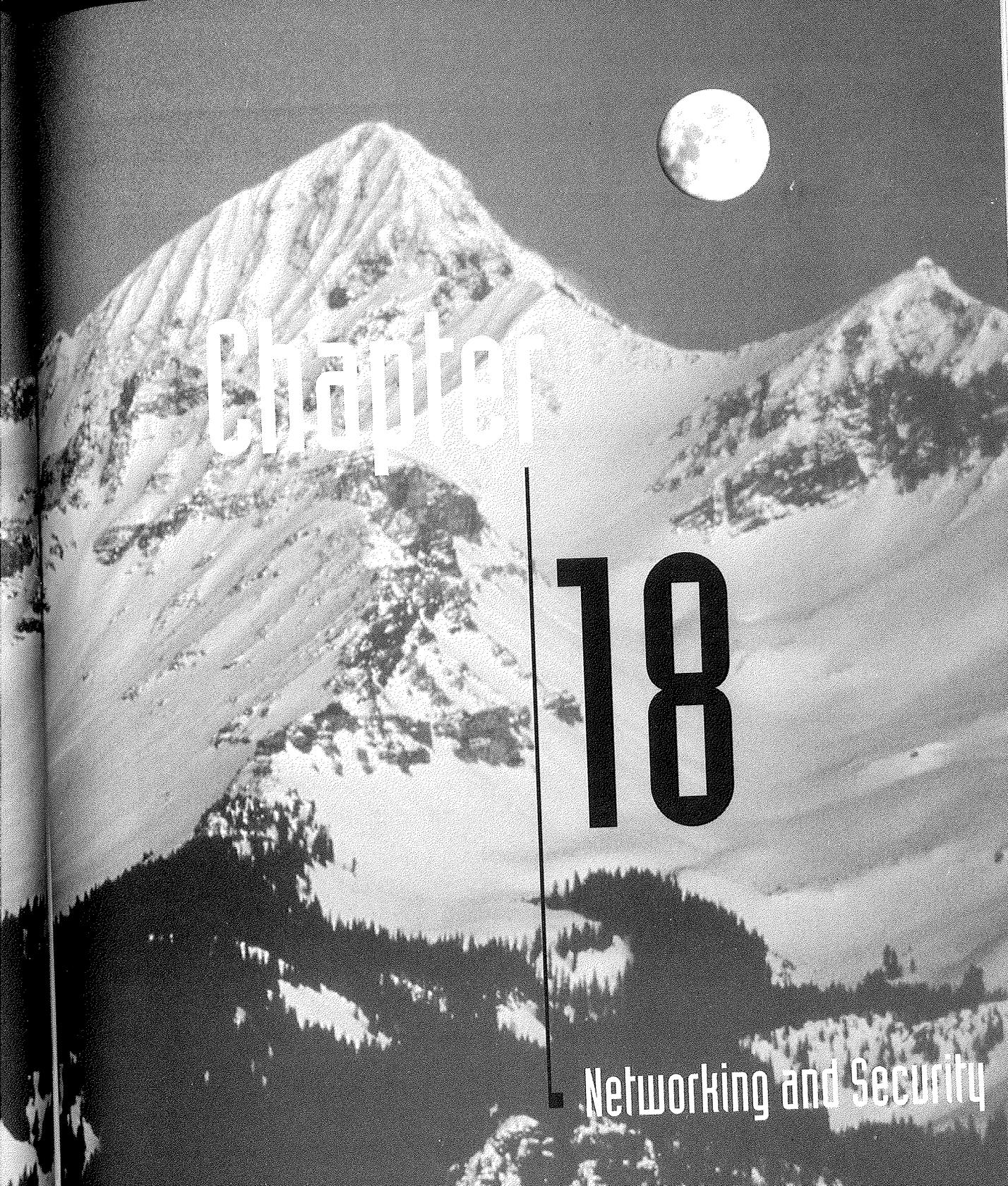
Chapter

18

Networking and Security

FEATURING

18
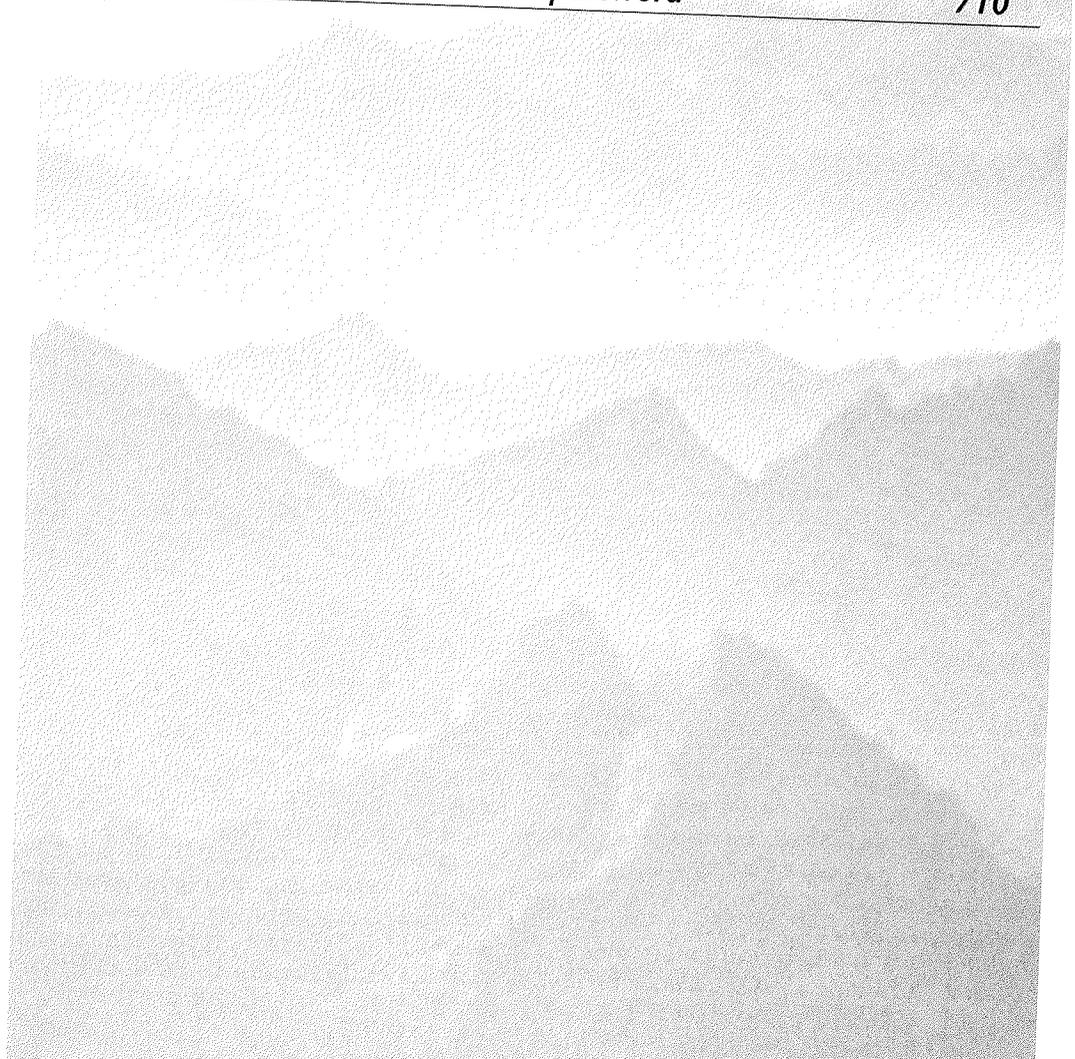
Networking and Security

This chapter covers two issues that will be of interest to anyone responsible for an Access installation on a network. The first is the one on most network administrators' minds: how to get peak performance from Access on a network. The second topic is setting up a security scheme to prevent unauthorized users from accidentally or deliberately harming objects within your Access applications.

Allowing Users to Share Data

In many organizations multiple users must have simultaneous access to the same data. Access is designed to support multiuser databases "out of the box," but you will need to consider a few factors carefully. The first is where to store the application itself. You can set up your database in either of two ways to allow multiple users to share data and other objects, as discussed in the sections that follow.

Option 1: Put the Entire Database on the Server

One way to give multiple users access to a database is simply to put the entire database (that is, the entire Access .mdb file) on the server, as shown in Figure 18.1. With this approach, there's no difference between a single-user database and a multiuser one; you just transfer the database to a shared drive and tell your users where to find it.

The one advantage to this approach is that all users share all the same objects. Thus a change to any object, including a form, report, or macro, is instantly accessible to all users. Data changes—such as adding, editing, or deleting records from a table—are also immediately visible.

> **NOTE**
>
> You must be extremely careful when changing the design of any object in a shared database. If two users are doing design work in the same database simultaneously, the database may become corrupted if one saves changes to an object the other has already modified. For safety, do not allow more than one user at a time to modify objects and always keep a backup of any networked database. Make sure everyone logs off before you back up the database so you know it's in a consistent state.

FIGURE 18.1

If you put the entire Access .mdb file on the server, all users will share all objects.

Workstation

Server

Workstation

ALL.MDB
Tables
Queries
Forms
Reports
Macros
Modules
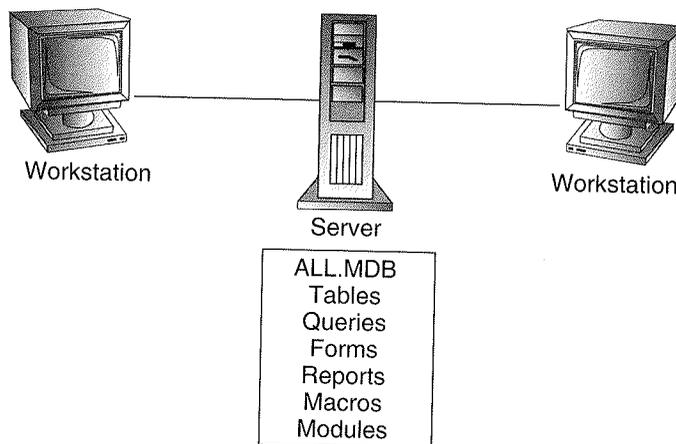
Option 2: Put Only Shared Data on the Server

The downside to putting the entire database on the server is that you end up with a lot of network traffic. Virtually every object that each user opens needs to come across the network. This includes forms and reports, which are normally static in an application in use, as well as the changeable tables. As an alternative, you can put just the shared tables on the server in a "data" database. Then set up a database that contains all objects except those shared tables, and put a copy of that "application" database on each workstation, as in the example shown in Figure 18.2. You can then use the File ➤ Get External Data ➤ Link Tables menu item to link the tables in the data database to those in the application database so that all users can see the shared data.

For more information on linked tables, see Chapter 7.

This approach has both an upside and a downside:

- It reduces network traffic because only shared table data is transmitted across the network. Forms, reports, and other objects are read from each user's local hard drive.
- The network administrator can more easily back up just the tables in the database because the tables are stored independently of the other objects.
- If a user changes some other object (such as a form, report, or macro), that change affects only his or her workstation. Other users never see that change.

(The last item in the list can be either a curse or a blessing, depending on whether the user improves or destroys the modified object.)

FIGURE 18.2

Splitting a database into a data database and an application database.

Workstation   Server   Workstation

| CODE.MDB	DATA.MDB	CODE.MDB
Queries Forms Reports Macros Modules	Tables	Queries Forms Reports Macros Modules
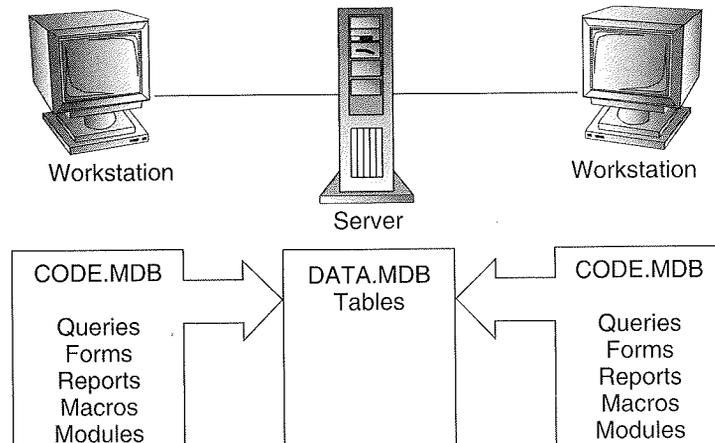
> **NOTE**
> To prevent users from changing objects, you'll need to use Access security features to protect your database objects (see "Securing Your Database," later in this chapter).

Separating the Tables

Putting just the shared tables on the network is easier than ever in Access 97, thanks to the Database Splitter Wizard. Here we'll take you through an example using our Order Entry database generated using the Database Wizard.

To create the database of shared tables, you need to do the following (you should already know how to use the Windows Explorer or the MS-DOS prompt to copy files and create directories):

1. Make a backup copy of the entire Order Entry database and give this copy a new name. (In the case of this example, the original database is named Order Entry1.mdb. We made a copy called OrderEntryBackup.mdb. Long file names are useful.) This copy will provide a safety net in case you later decide that you didn't really want to split the database after all.
2. Open the database that you want to split. Hold down the Shift key when you open the database so the Switchboard form won't open.
3. Select Tools ➤ Add-ins ➤ Database Splitter. This action starts the Database Splitter Wizard, shown here.
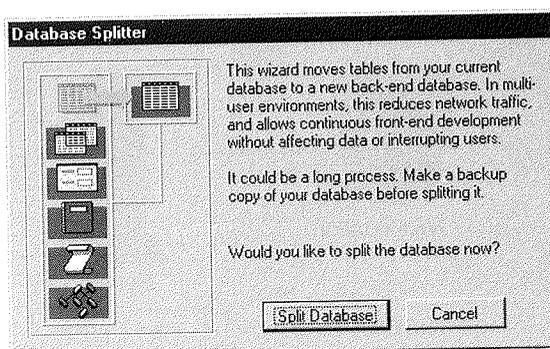
4. Read the information on the Wizard screen and then click on the Split Database button.
5. Enter a name for your back-end database in the File name text box of the Create Back-end Database dialog box. Make sure that the directory is the correct directory on the network drive. Then click on the Split button.

> **WARNING**
>
> Be sure to close all open objects (Tables, Queries, Forms, and Reports) before splitting your database. Otherwise, the Database Splitter will not be able to properly export and reattach the tables.

6. Click on the OK button when you see a dialog box announcing that the database was successfully split. You now have two versions of the database, the back-end version containing just the tables and the original version containing all the rest of the objects and links to the tables in the back-end version.

7. Close the open version of the database.

At this point, the server holds a copy of the database tables (in their own .mdb file) that you want the users to share. By checking the Contents tab of the File ➤ Database Properties dialog box, you can see that this back-end database contains only the tables from the original database, as shown in Figure 18.3.

The original Order Entry1.mdb file contains all of the other database objects plus links to the tables in the Order Entry1_be.mdb database. The names of linked tables are now marked with an icon in the local database, as shown in Figure 18.4.

FIGURE 18.3

Order Entry1_be.mdb contains only the tables from the original database.

Order Entry1_be.mdb Properties

General | Summary | Statistics | Contents | Custom |

Document Contents:

Tables
  All Fields
  Customers
  Employees
  Employees With Supervisors
  My Company Information
  My Customers
  My Orders
  Order Details
  Orders
  OrdHist
  Payment Methods
  Payments
  Products
  Shipping Methods
  Switchboard Items
Queries
Forms
Reports
Macros
Modules

OK   Cancel
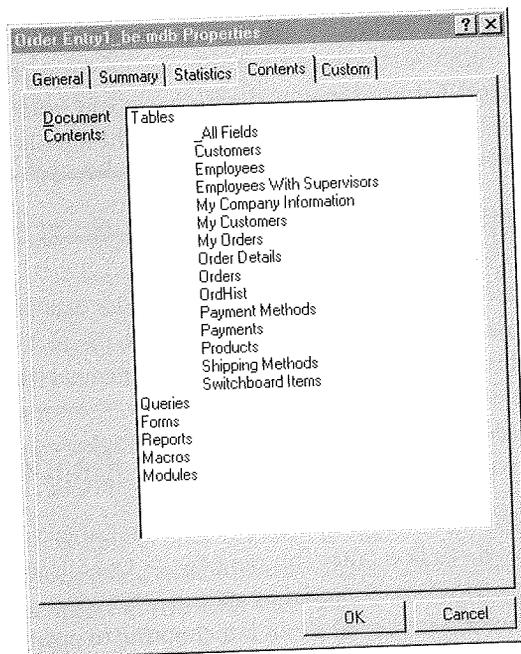
FIGURE 18.4

The Order
Entry1.mdb
*database, after
splitting, show-
ing the tables
linked to* Order
Entry1_be.mdb.
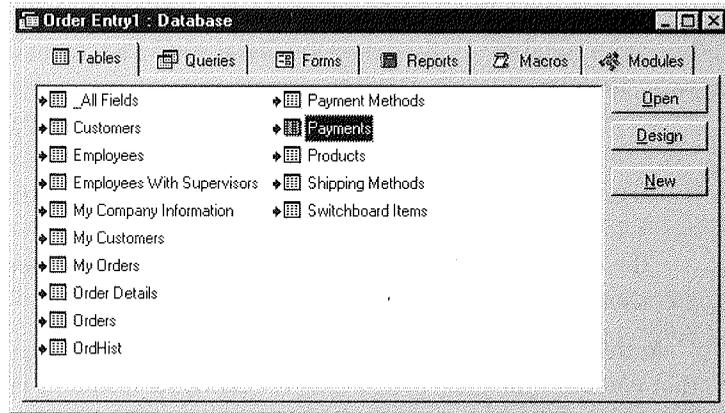
Now you can put a copy of the local database on every user's workstation. When the user opens the local copy of the database, Access will automatically link to the shared tables on the server and handle any conflicts that arise when two or more users try to edit the same data. (See "Editing on a Network" later in this chapter.)

> **TIP**
>
> If you ever need to change the links to the tables, select Tools ➤ Add-ins ➤ Linked Table Manager. Check the Always prompt for new location checkbox in the Linked Table Manager dialog box, and you will have the opportunity to edit the link information using a standard file dialog box.

Preventing Exclusive Access

When users will be sharing data in an Access database, you need to make sure that no single user opens the database in Exclusive mode. Otherwise, no other users can open that database. Access for Windows 95 has changed its default behavior to support shared access more directly than previous versions. The default values for most settings support shared access. To make certain that use of Exclusive mode is discouraged or prevented, you can take these three steps:

- Instruct all users to make certain the Exclusive checkbox is cleared in the Open Database dialog box (after choosing File ➤ Open Database) before opening the database. (This checkbox is cleared by default. This approach assumes, of course, that all users will be conscientious about not choosing to open a database in Exclusive mode.)

- Choose Tools ➤ Options from the Access menu bar, select the Advanced tab, and make sure the Default Open Mode option is set to Shared, its default value. This setting automatically clears the Exclusive checkbox when the user first gets to the Open Database dialog box.
- Set up a security system (discussed later in this chapter) that denies the Open Exclusive permissions to selected users. This is the strictest control, since it doesn't even let users open the database exclusively.

Of course, you'll need to grant yourself and other administrative users the right to open the database in Exclusive mode so that you can perform operations that require exclusive use, such as backing up, compacting, and repairing the database.

For more information on compacting and repairing, see Chapter 17.

Creating Upgradeable Custom Applications

Separating the tables from the other database objects is also a good strategy if you plan to market a custom application that you've created or if you need to maintain a database that you've already distributed on a network to multiple users.

You can put all the tables for an application in one database, and then put all the other objects in a separate database. Use the Database Splitter Wizard, as in the example above, to split all the tables in the separate database.

Be sure to distribute both databases to first-time buyers or users. When you release an upgraded version of your product, send the upgraders only the database (.mdb) file that contains the objects, not the database containing tables. That way, you don't have to worry about users overwriting their existing data when they install your upgraded version. Instead, they'll just link the new front-end database to their existing tables.

> **WARNING**
>
> Avoid changing the structure of tables after the initial release of your application. Otherwise, you'll need to ship the revised tables, and you'll need to provide a convenient way for users to put their data into your newly structured tables. This procedure can be a nuisance for both you and the upgraders.

Editing Data on a Network

Access uses a simple, common-sense strategy for handling conflicts that occur when two or more users edit the same data. The way Access handles such conflicts depends on the Record Locks property of the form your users are using to do the edits, as shown in Figure 18.5.

Choices for the Record Locks property.
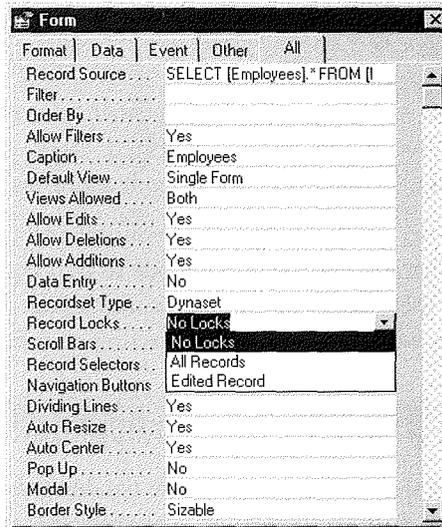
> **NOTE**
>
> We'll discuss conflict handling in datasheets a little later, since most often you'll have your network users working via forms.

If the Record Locks property is set to Edited Record, when one user is editing a record (so that the pencil symbol appears in that record's selector) and another user tries to edit that same record, the second user sees an international No symbol, indicating that the record is locked by another user.

> **TIP**
>
> Access may take up to 60 seconds to display the No symbol when another user is editing a record. You can change this interval on the Advanced tab of the Tools ➤ Options dialog box. Set the Refresh Interval to the maximum number of seconds you want Access to wait before updating a record's locking status.

When the first user saves the changes, the No symbol disappears, Access updates the view of the record on both machines, and the second user can then view and change that same record. Figure 18.6 shows the situation where one user has "locked out" another user by editing a record.

FIGURE 18.6

With Edited Record Locking, only one user can edit a record at a time. Other users are "locked out" of the record.
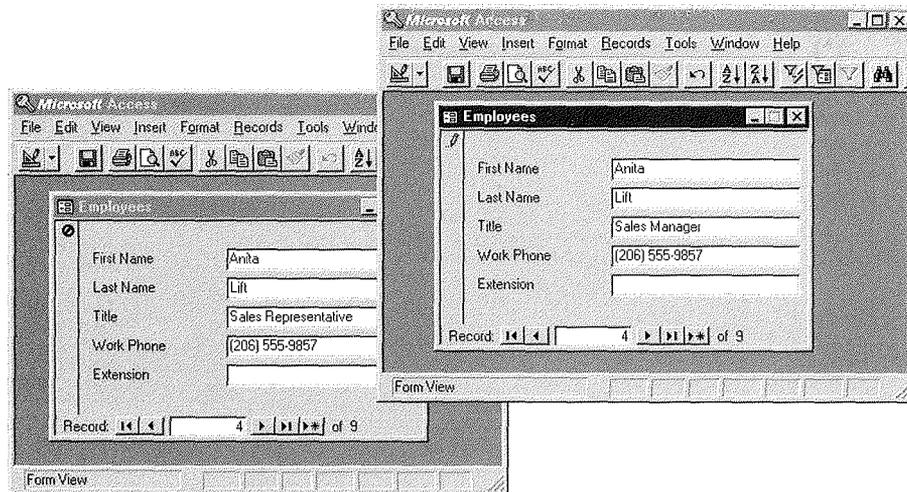
NOTE

Access saves the changes to a record whenever you move the cursor to another record or choose Records ➤ Save Record or press Shift+Enter.


If Record Locks is set to No Locks, both users will be allowed to edit the record. However, when the second user tries to save the changes after the first user has done so, Access offers the second user the chance to overwrite the first user's changes, copy the record to the Clipboard for pasting into the table later, or discard the changes, with the dialog box shown in Figure 18.7.

If you get this dialog box on your screen, it means you have tried to modify a record that another user has already changed. You have three choices for dealing with this situation:

- **Choose Save Record** to have your changes overwrite whatever the other user saved, without inspecting the records.
- **Choose Drop Changes** to leave the other user's record alone and discard any changes you have made.
- **Choose Copy to Clipboard** to leave the other user's record alone but place your own changes on the Windows Clipboard. When you do this, your form will be updated to show the other user's changes. If you decide you'd rather keep your version, simply click on the form's record selector to select the whole record, and choose Edit ➤ Paste or press Ctrl+V to return your changes to the form. Then save your record again.

PART III

Database Tuning and Administration

With No Locks,
you'll get a
Write Conflict
warning when
you try to
change data
that someone
else has edited.
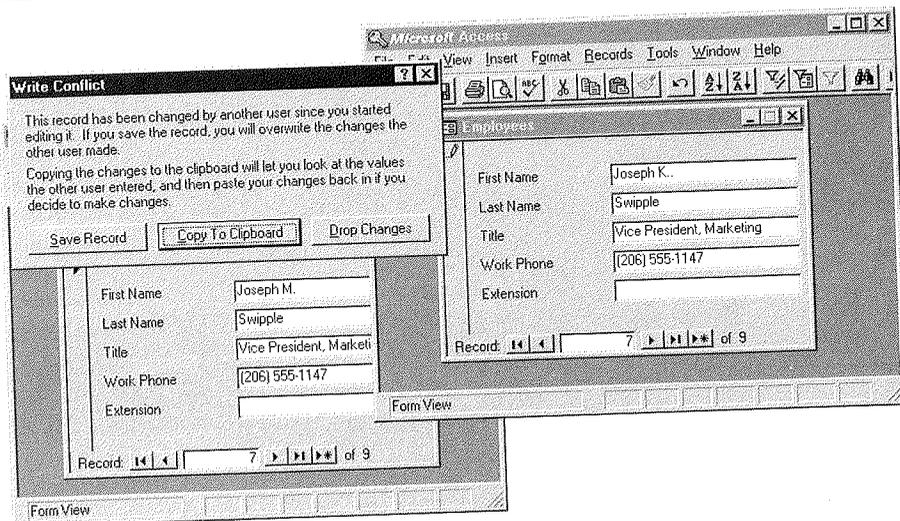
Refreshing Network Data

Access automatically refreshes each user's screen at regular intervals, to help ensure that each user is seeing current data. However, you can force Access to refresh your data at any time by choosing Records ➤ Refresh.

When Access refreshes the current form or datasheet, it updates changes and indicates deleted records. However, it does not reorder records, show new records, or update a dynaset to show or hide records that no longer meet the underlying query's selection criteria. To force Access to refresh a dynaset completely, press Requery (Shift+F9).

Tweaking Multiuser Settings

Access does not support a single network strategy that works perfectly for all situations. You may need to experiment with some of the default settings to achieve maximum performance with minimal conflicts on your own network. Here's how:

1. Choose Tools ➤ Options from the Access menu bar.

2. Click on the Advanced tab to view the multiuser and ODBC settings, as below.
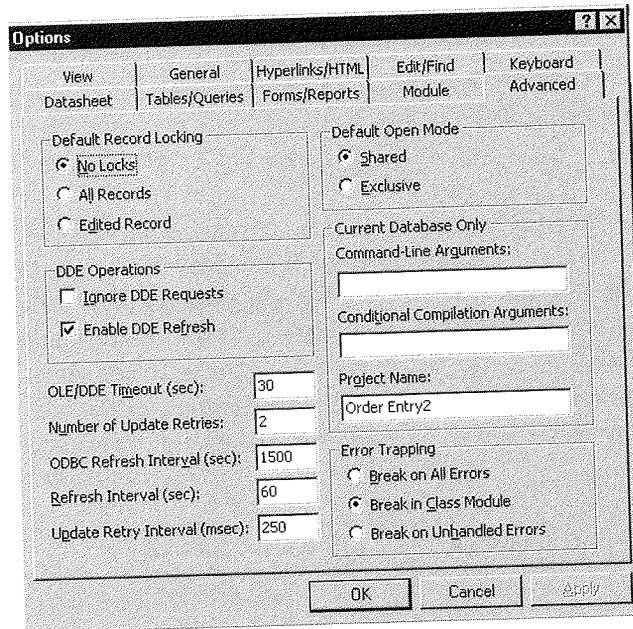
3. Use Table 18.1 (and the built-in help) to choose new settings.

TABLE 18.1: MULTIUSER OPTIONS AND SETTINGS

OPTION	SETTING	RESULT
Default Record Locking	No Locks (default)	Records are not locked during edits.
	All Records	All records underlying a particular object (e.g., a form) are locked when that object is open.
	Edited Records	Only the record being edited is locked.

TABLE 18.1: MULTIUSER OPTIONS AND SETTINGS (CONTINUED)

OPTION	SETTING	RESULT
Default Open Mode	Shared (default)	Database is open for shared use by default.
	Exclusive	Database is open for exclusive use.
Refresh Interval	1 to 32,766 seconds (default = 60)	Updates your screen at the specified interval.
Update Retry Interval (see the section "Minimizing Conflicts")	0 to 1,000 milliseconds (default = 250)	Waits for the specified time before trying again to save a locked record.
Number of Update Retries	0 to 10 (default = 2)	Number of times Access will automatically try to save a change to a record that another user has locked.
ODBC Refresh Interval	1 to 3,600 seconds	Updates your screen at the specified interval when you're accessing a database using ODBC.
Ignore DDE Requests	Default is No (unchecked)	Determines whether Access responds to DDE requests from other applications.
Enable DDE Refresh	Default is Yes (checked)	Determines whether DDE links are refreshed whenever the screen is updated.
OLE/DDE Timeout	0 to 300 seconds (default = 30)	Determines how long Access waits for an OLE or DDE operation to complete.

4. Choose OK when you're done.

Record-Locking Strategies

The Record Locks property applies only to forms. The Default Record Locking setting in the Advanced options tab applies to datasheet views of tables and queries and to dynasets opened in Basic. The same rules for resolving write conflicts apply in all cases. If you

encounter a record-locking conflict in a Visual Basic procedure, Access generates a custom error that you can trap and respond to.

For more information on dealing with errors in your Visual Basic code, see Chapter 25 or search for *Errors* with the Office Assistant.

Now that you know the various record-locking settings, how do you choose among them? It depends on how your users use the data and how much training you can give them. Let's look at the pros and cons of each strategy.

No Locks Strategy

As we explained above, when you use the No Locks strategy (sometimes called *optimistic locking*), records are not locked while being edited. Two users can edit the record at the same time. When you try to save your changes to a record that somebody else has also changed, you'll be given the option to overwrite the other user's changes, copy your version of the record to the Clipboard, or discard your changes, as discussed above.

Although the No Locks strategy offers the most flexibility, it also creates two potentially unpleasant situations:

- After you make changes to a record, another user can easily overwrite those changes.
- Another user can lock a record that you're editing. You won't be able to save your changes until the other user unlocks the record.

An alternative to the No Locks strategy is to automatically lock whatever record is being edited.

Edited Record Strategy

When you choose the Edited Record locking strategy (sometimes called *pessimistic locking*), any record that's currently being edited by one user is locked and unavailable to all other users. No two people can edit the same record at the same time, which means:

- On the upside, Access automatically ensures that no two users edit the same record at the same time. And you can be sure that once you start editing a record you'll be able to save your changes.
- On the downside, other users may start getting irritated if you keep a particular record locked for too long. Even worse, a record lock in Access nearly always affects more than one record, since Access locks records in 2048-byte pages. This means that users can be locked out of records that no one else is editing, as shown in Figure 18.8.

PART

III

Database Tuning and Administration

FIGURE 18.8

A record locked
by editing
another record.
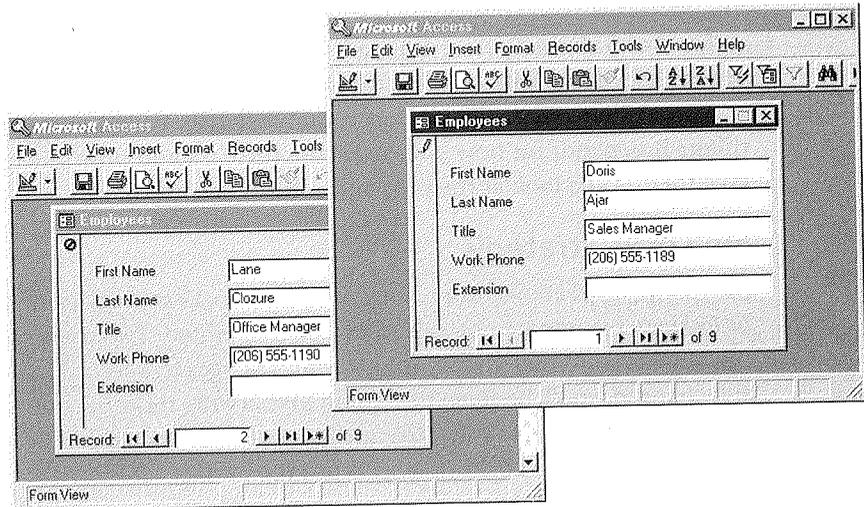
> **NOTE**
>
> When you're attached to a SQL database via ODBC, the rules of the SQL database govern locking. Access always acts as if you've selected the No Locks (optimistic locking) strategy.

The solution to the problem, of course, is to practice good network citizenship and make sure that you always save a record immediately after you've made your changes. That way, other users will have instant access to the modified record.

All Records Strategy

The most restrictive locking option is All Records. Once a user opens a form or datasheet, that user has a lock on all its records. No other users can change any records in the table as long as that person is using the table. Use this method only if you're absolutely sure that you want only one person at a time to be able to make changes to a table. The need for this option is generally limited to administrative table changes that have to be completed without interference from other users.

Choosing a Locking Strategy

Which locking strategy should you use? The answer depends on your data and your application, of course. But for almost all networked Access applications, we've found that the benefits of the No Locks strategy far outweigh its disadvantages. Although you'll have to train your users to deal with the occasional write conflict errors that may occur, the gain in performance more than balances this inconvenience.

In addition, in most workplaces you can use the natural workflow to reduce or eliminate record-locking conflicts. If Joe is responsible for customers whose last names start with A through M and Mary is responsible for those from N through Z, they won't even be trying to edit the same records at the same time.

Minimizing Locking Conflicts

When Access encounters a locking conflict, it will make several tries to save the record before giving up and showing an error message to the user. Access waits for whatever period of time is specified in the Update Retry Interval multiuser setting and then tries to save the record again. It repeats this process as many times as you've specified in the Number of Update Retries setting. If it can't resolve the conflict after that number of tries, then it displays a locking conflict error message.

You can minimize update conflicts and error messages by tweaking those two settings. For example, if users frequently get locking error messages, and you think it's because too many people are trying to save data at the same moment, then *increase* both settings. Access will wait longer, and try more times, before showing the error message. Of course, if many locking conflicts occur, this setting will make your application appear to be more sluggish as it makes multiple futile retries to save the data.

On the other hand, if you want Access to display a locking error message as soon as a conflict occurs, set the Number of Update Retries option to zero.

Securing Your Database

Access allows you to implement security on your database objects as you need it. By default, security is completely invisible to both the designers and the users of an Access database. As your needs require it, you can secure individual objects so that, for example, most users can't modify a particular form. If you are extremely concerned about security, you can use Access to remove all but a few ways to retrieve data from your tables. In networked applications, a well-designed security system can help make the application more maintainable by eliminating many sources of potential disaster.

PART

III

Database Tuning and
Administration

Security Concepts

To understand Access security, you'll need to grasp four basic security concepts: *users* and *groups* have *permissions* on *objects*.

- An Access *user* represents a single person who uses an Access application. Users are distinguished by their user name, password, and a unique secret identifier called the Personal Identifier (PID). To use a secured Access application, a user has to type in her user name and password to be able to get to any objects.
- An Access *group* is a collection of users. You can use groups to represent parts of your organization, such as Development and Accounting, or simply security levels, such as High and Low. Often you'll find that assigning users to groups, and permissions directly to those groups, makes a security system more maintainable.
- An Access *permission* is the right to perform a single operation on an object. For example, a user can be granted read data permission on a table, allowing that user to retrieve data from that table. Both users and groups can be assigned permissions.
- An Access security *object* is any one of the main database container objects (table, query, form, report, macro, or module) or a database itself.

WARNING

Because both users and groups can have permissions, you may have to check several places to determine a user's actual permissions. The user's actual permissions are the *least restrictive* combination of the user's own permissions (called explicit permissions) and the permissions of all groups the user belongs to (called implicit permissions). So if Mary does not have permission to open the Accounting form, but she's a member of the Supervisors group that does have permission to open that form, she will be able to open the form.

Permissions Granted

Access includes a rich set of permissions that you can assign to groups and individuals on an object-by-object basis. You can grant any of the permissions listed in Table 18.2 to any group or to any individual user in a group.

Access Logons

Every single time you start Access, you must supply a valid user name and password. Surprised? Think you've got a special copy of Access that doesn't require this step? That's because Access does its best to be helpful. When you launch Access, it automatically tries to log you on as a user named Admin with a blank password. If this process works—and you

PERMISSION	PERMITS USER TO	CAN BE APPLIED TO
TABLE 18.2: PERMISSIONS YOU CAN ASSIGN TO INDIVIDUAL USERS AND GROUPS OF USERS		
Open/Run	Open a database, form, report, or run a macro	Databases, forms, reports, macros
Open Exclusive	Open a database with exclusive access	Databases
Read Design	Look at an object in design view	All object types
Modify Design	View, change, and delete objects	All object types
Administer	Full access, including the right to assign permissions to users	All objects and the security system
Read Data	View, but not alter, data	Tables and queries
Update Data	View and change data, but not insert or delete	Tables and queries
Insert Data	View and add data, but not modify or delete	Tables and queries
Delete Data	View and delete data, but not add or modify	Tables and queries

haven't activated your security system by assigning a password to the Admin user—Access suppresses the logon dialog box completely.

To be able to log on as any other user, you'll need to assign a password to the Admin user, as discussed below. The next time you start Access, you'll see this logon dialog box:

If for some reason you decide to deactivate security, you can suppress the logon dialog box by changing the Admin user's password back to a blank.

Workgroup Files

Access stores security information in a workgroup file, which is named system.mdw by default. Access includes a tool, called the Workgroup Administrator, to create new workgroup files. To create a new workgroup file, follow these steps:

1. Locate the Workgroup Administrator (wrkgadm.exe) item in Explorer and open it, as shown below.

Workgroup Administrator

Name: Mike Gunderloy
Company: Pyramid Computers
Workgroup   C:\MSOFFICE\ACCESS\SYSTEM.MDW

Your workgroup is defined by the workgroup information file that is used at startup. You can create a new workgroup by creating a new information file, or join an existing workgroup by changing the information file that is used at startup.

[Create...]   [Join...]   [Exit]
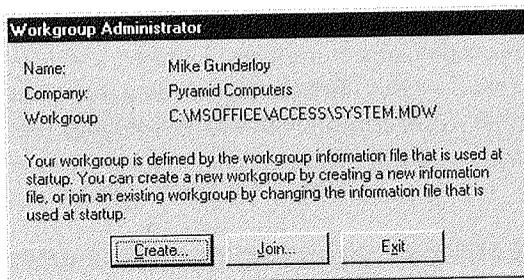
2. Click on Create.
3. Supply a name, organization, and unique Workgroup ID (WID). The WID is used by Access to make sure that your workgroup is unique. Store this information in a safe place—you'll need it if you ever need to re-create your original workgroup.

Workgroup Owner Information

The new workgroup information file is identified by the name, organization, and case-sensitive workgroup ID you specify.

Use the name and organization information below, or enter a different name or organization. If you want to ensure that your workgroup is unique, also enter a unique workgroup ID of up to 20 numbers or letters.

Name: Mike Gunderloy
Organization: Sybex
Workgroup ID: 224em78N95

[OK]   [Cancel]

4. Supply a path and file name for the new Workgroup file. You should use the .mdw extension for this file.

Workgroup Information File

Use the path and name below, or enter a different path and name for the new workgroup information file.

Database: OSOFT OFFICE 97\OFFICE\SYBEX.MDW   Browse...

OK   Cancel
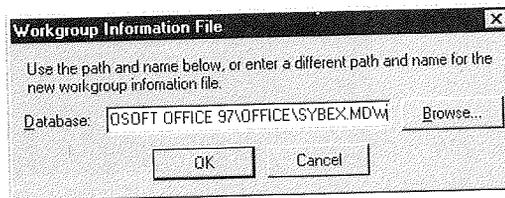
5. Click on OK three times to create the new workgroup, confirm its information, and return to the main Workgroup Administrator screen.
6. Click on Exit to close the Workgroup Administrator.

WARNING

The original workgroup file created when you install Access is *not secure* because Access creates it for you using the user name and organization name you used for the Access install and a blank WID. Anyone who can get to your computer and use Help ➤ About in any Office application can recover this information and so re-create your original workgroup file. Armed with this file, an intruder can break any security scheme you design.

To learn more about workgroups and the workgroup information file, search for *Workgroup File* with the Office Assistant and click on *Create A New Microsoft Access Workgroup Information File*.

You can also use Workgroup Administrator to switch from one workgroup file to another. You'll need to do this if you have secured databases from two different sources. To switch workgroups, follow these steps:

1. Locate the Workgroup Administrator (wrkgadm.exe) item in Explorer and open it.
2. Click on the Join button.
3. Type in the name of the workgroup you want to join

Or

Use the Browse button to locate the file on your drive.

4. Click on the OK button twice to join the new workgroup and confirm the information message.

Workgroup Administrator

You have successfully joined the workgroup defined by the workgroup information file C:\MSOFFICE\ACCESS\SYSTEM.MDW

OK
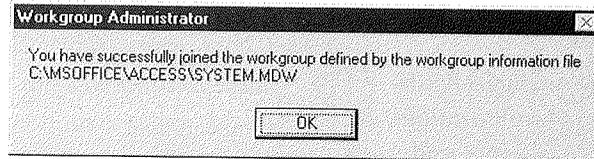
5. Click on Exit to close the Workgroup Administrator.

Built-in User and Groups

Every Access workgroup comes with the built-in user and groups listed in Table 18.3 and Table 18.4. Access created this user and these groups to provide a bare bones security system.

TABLE 18.3: DEFAULT ACCESS USER

USER	MEMBER OF	COMMENTS
Admin	Admins, Users	Default logon user

TABLE 18.4: DEFAULT ACCESS GROUPS

GROUP	CONTAINS	COMMENTS
Admins	Admin	Any member has full permissions on all objects, regardless of security.
Users	Admin	Members by default have permissions on all objects.

The most important thing to realize about the built-in user and groups is that most of them are not secure and cannot be made secure. The Admin user and the Users group are identical in every single workgroup file ever created. If you assign permissions to Admin or Users, you are in effect making those permissions available to any Access user.

Since the Admin user has full permissions on all objects by default, and everyone is logged in as the Admin user unless they've activated their security (that is, placed a password on the database), this system ensures that all users can swap databases without worrying about security.

Ownership: The Super Permission

Another important security concept is the idea of *ownership*. Whoever creates an object in the first place, or imports it from another database, is the initial owner of the object. The owner can give ownership to another user or group, or any member of the Admins group can reassign the ownership of any object.

> **TIP**
> Assigning object ownership to a group such as Developers makes it easier for multiple developers to work with objects in a secured database.

The owner of an object always has Administer permission on that object, even if someone else tries to take it away—and in some cases, even if the interface erroneously reports that they don't have this permission. Therefore, an object's owner can do anything with that object, no matter how anyone else tries to limit the owner.

Working with Users and Groups

The first step for implementing a security system is to decide which users and groups you'll need. You'll need to keep at least one user—usually yourself—in the Admins group, since only members of the Admins group can create new users and perform other security tasks. Other users should be grouped by the tasks they need to perform so that you can assign permissions to groups. A security scheme for a small database might look like the diagram in Figure 18.9.

Select Tools ➤ Security ➤ User and Group Accounts from the Access menu to open the User and Group Accounts dialog box. From this dialog box you can create and delete users and groups, assign users to groups, and change your own password.

FIGURE 18.9

Plan for security in an Access database.
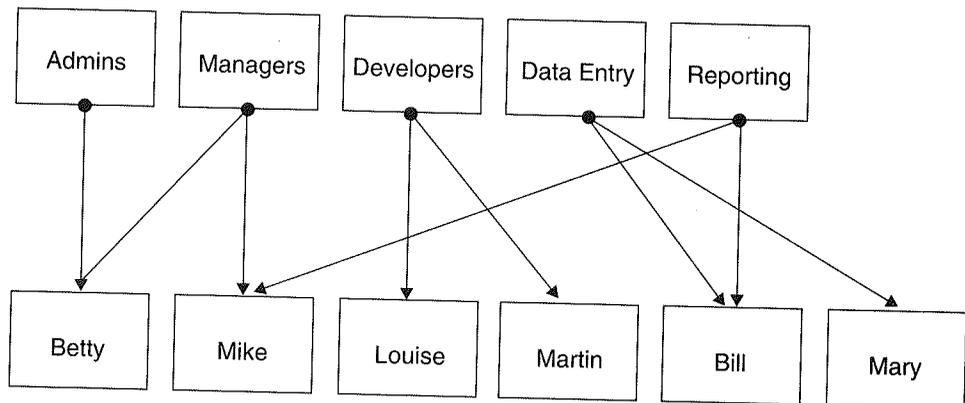
The Users Tab
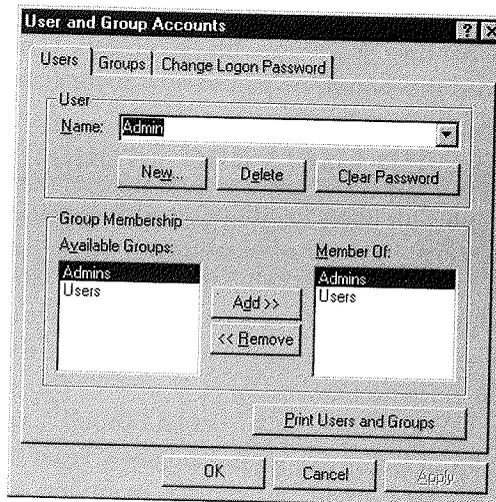
The Users tab has a combo box at the top where you can select any user in the system. The Group Membership section shows which groups this user is a member of.

• **To create a new user,** click on the New button. In the dialog box that appears, supply a unique name and Personal ID (PID) for the user. Click on the OK button to create the user. Access uses the PID to uniquely identify the user you've just created.

> **TIP**
> The PID is *not* a password. New users are already created without a password. To assign a password to a user, close Access, reopen it, log on as the new user, and use the User and Group Accounts dialog box to set that user's password.

- **To delete a user,** select the user in the combo box and click on the Delete button; then click on the Yes button to confirm the delete. You can't delete any of the built-in users.
- **To clear the password of a user who has forgotten his or her password,** click on the Clear Password button.
- **To add a user to a group,** select the group in the left list box and click on the Add>> button.
- **To remove a user from a group,** select the group in the right-hand list box and click on the <<Remove button.

> **NOTE**
> You can't remove any user from the Users group, and you can't remove the last member from the Admins group.

The Groups Tab
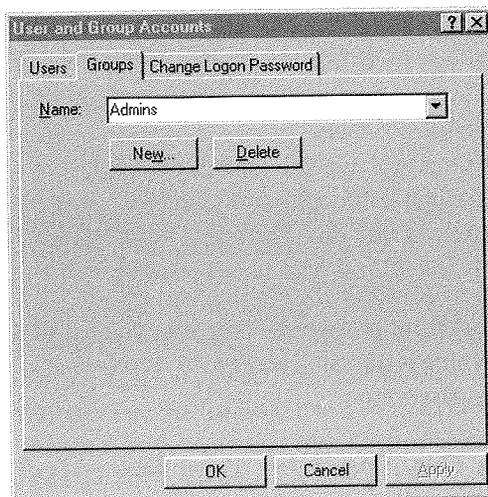
The Groups tab has a single combo box that shows you all of the existing groups in your database.

- **To create a new group,** click on the New button, supply a name and Personal ID (PID) for the new group, and click on the OK button. Access uses the PID to make this new group unique.

TIP

You should store all of the PIDs you use for both users and groups, along with the WID for your workgroup file. If your workgroup file is ever lost or corrupted, you can use this information to re-create the information it contains.

- **To delete a group,** select the group in the combo box, click on the Delete button, and click on the Yes button to confirm the deletion.

The Change Logon Password Tab
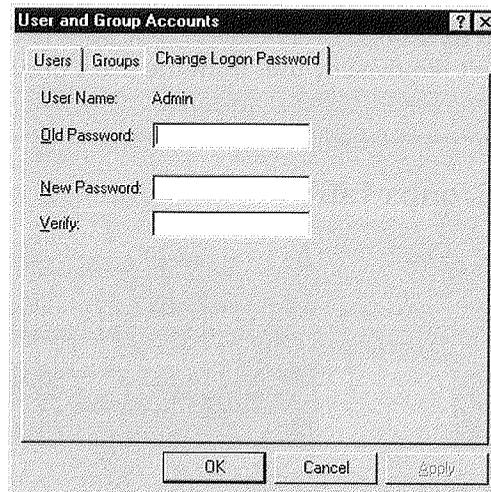
To change your password, enter your current password and then enter the new password, typing it the same way twice. Access checks that you didn't accidentally mistype the new password.

Viewing Ownership and Permissions

To modify object permissions and ownership, select Tools ➤ Security ➤ User and Group Permissions from the Access menus.

The Permissions Tab

To check the permissions by user for individual database objects, click on the Permissions tab. Then use the dialog box as follows:
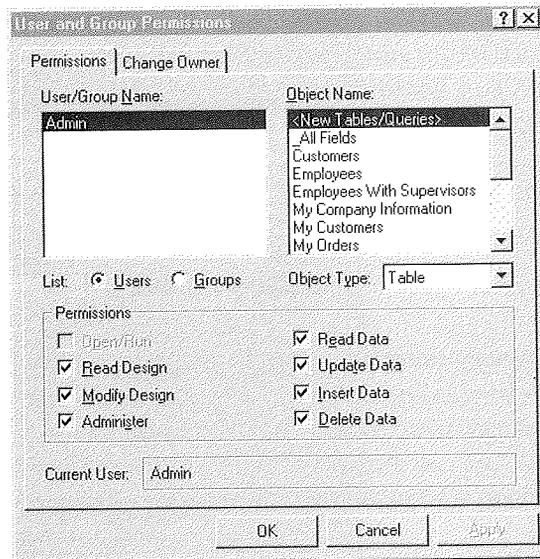
- **To view a user's permissions on any object,** first choose the Users radio button. Then click on the user whose permission you want to check in the list box. Select the type of the object from the combo box. Select the object in the object list box. The Permissions area will show the current explicit permissions for this user.
- **To view a group's permissions on any object,** first choose the Groups radio button. Then click on the group whose permission you want to check in the list box. Select the type of the object from the combo box. Select the object in the object list box. The Permissions area will show the current permissions for this group.
- **To change permissions on an object,** first choose the user or group you want to change permissions for, as above. Select the type of object from the combo box. Select one or more objects in the list box. Click in the Permissions checkboxes to select or deselect the various permissions. When the correct set of permissions is showing, click on the Apply button to make the changes.

PART

III

Database Tuning and
Administration

The Change Owner Tab

If you click on the Change Owner tab you can view the current owner of an object or change the owner.
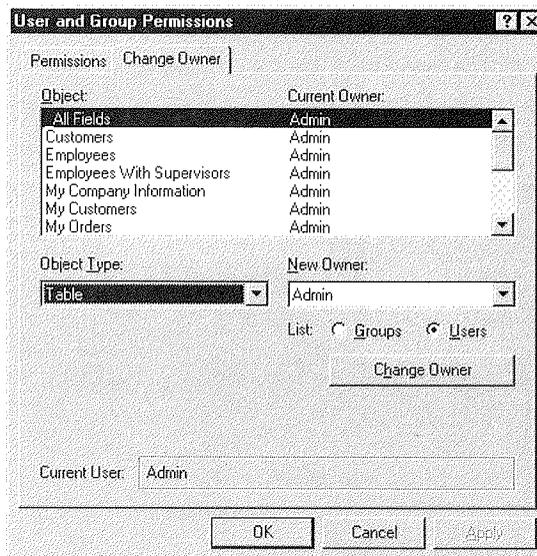
- **To view the current owner of an object**, select the Object Type in the left combo box. Select one or more objects. The New Owner combo box will show you the current owner of these objects. (If you select objects owned by more than one user or group, the box will remain blank.)
- **To change ownership**, select the Object Type in the left combo box. Select one or more objects. Select the New Owner from the combo box and click on Change Owner.

Securing Your Database

As you've seen so far, Access security can be a complex business. The interactions of users, groups, owners, objects, and permissions require careful study. However, following a few simple steps will help ensure the integrity of your security system.

1. (Optional) If you haven't done so already, use the Workgroup Administrator to create a new, unique Workgroup. Store the WID in a safe place.

2. Start Access and create a new user for yourself to use. Add this user to the Admins group.

3. Change the Admin user password to any nonblank string. Store this password in a safe place in case you later decide to desecure the database.

4. Exit and restart Access. Log in as your new user. Change the password on your new user to something known only to you.

5. Create any other users and groups you require. Store the PIDs in a safe place in case you ever need to re-create one of these users or groups.

6. Run the Access Security Wizard (described below) to remove permissions from the database.

7. Assign permissions to those users and groups you want to be able to work with objects.

The User-Level Security Wizard

Access includes a built-in User-Level Security Wizard to handle some of the tedium of securing a database. The User-Level Security Wizard makes a new copy of your database owned by the user who runs the Wizard, makes sure all objects in that database are owned by that user as well, and removes all permissions for the Admin user and the Users group from these objects. It also encrypts your database for protection from prying eyes armed with hex editors.

To use the User-Level Security Wizard, choose Tools ➤ Security ➤ User-Level Security Wizard from the menus. The Wizard starts by asking you which objects to secure, as shown in Figure 18.10. Most of the time you will want to secure all objects in your database.

When you proceed from this dialog box, Access will prompt you for a file name for your new secured database. The Wizard will then create this new database and make

FIGURE 18.10

When you launch the User-Level Security Wizard, you can choose exactly which objects in your database to secure.

User-Level Security Wizard

The Security Wizard creates a new secured database from your existing unsecured database. Your existing database isn't modified in any way. If you've never used Microsoft Access Security before, click Help for an overview.

What objects do you want to secure?

☑ Tables ☑ Forms ☑ Macros
☑ Queries ☑ Reports ☑ Modules

Current User: Admin

Workgroup File: C:\PROGRAM FILES\MICROSOFT OFFICE 97\0

OK
Cancel
Help

secured copies of your objects in it. The process ends with the congratulatory message shown here.
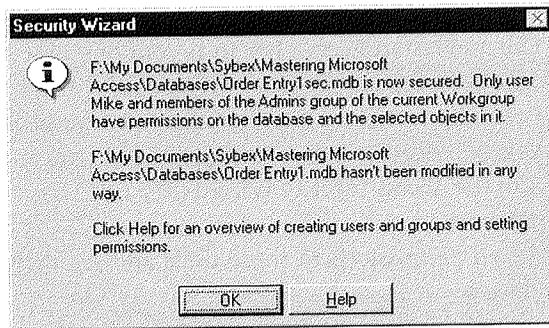
Here are some additional sources of information about security:

- From the Access menu bar, choose Help ➤ Contents and Index and click the Contents tab. Select *Securing A Database* and double-click on the topic you're interested in. You can then choose Options ➤ Print Topic from the Help window's button bar to print the topic as needed.
- For tips on planning database security, search for *Security* with the Office Assistant and then click on *Secure A Database*.
- You can also refer to Chapter 14 in the *Building Applications* manual that comes with your Access program.
- Clicking on Help from the User-Level Security Wizard will provide you with an overview of using Access security.

Skating Past the Logon Dialog Box

Once you've activated the login procedure for Access (which you do by setting up a password for the Admin user), you'll always be faced with this dialog box as soon as you start Access:
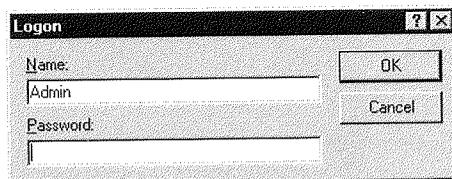
If you get tired of filling out the dialog box, you can put your user name and (optionally) your password into your startup command. That way, Access will fill in the dialog box automatically and take you right past it.

To set up a custom startup command, you can use any combination of these three custom startup switches:

<database name> If you want to create a shortcut to open a particular database when you start Access, follow the startup command with a blank space and the location and name of the database you want to open.

/User <user name> To supply a user name at startup, follow the startup command with a space, followed by /User, followed by a space and your user name.

/Pwd <password > To supply your password at startup, follow the startup command with a space, followed by /Pwd, followed by another space and your password.

You can set up a custom startup command by using Windows Explorer. The procedure we'll explain here doesn't change the way your original copy of Access works at all. Rather, it creates a new icon on your Windows desktop and associates it with your selected settings. Here are the exact steps:

1. Launch the Windows Explorer, make sure it doesn't fill the whole screen, and navigate to the folder containing the `msaccess.exe` program (usually the `c:\program files\msoffice\access` folder).
2. Drag this program out of Explorer by holding down the *right* mouse button and drop it on any blank area of your Windows desktop. Select Create Shortcut(s) Here from the context menu that appears when you drop the program.
3. Right-click on the icon you just created. Select Properties from the menu and click on the Shortcut tab in the Properties dialog box.
4. Enter the command line switches in the Target text box and choose OK.

Let's suppose that you've been assigned the user name Gondola and the password omnipotent. Furthermore, you want to have this shortcut automatically open the database named ContactManagement1.mdb in the `c:\contact` folder. In that case you'd want to change the startup command in the Command Line text box to:

```
C:\MSOFFICE\ACCESS\MSACCESS.EXE c:\contact\
ContactManagement1.mdb /User Gondola /Pwd omnipotent
```

The one risk here, of course, is that anyone who has access to your computer, and a little knowledge of shortcuts, can look up your password in about two seconds flat. If that's a risk you cannot afford to take, then you can leave the password out of the startup command (in my example, remove /Pwd omnipotent). If you choose this option, you'll have to provide the password each time you start Access.

PART

III

Database Tuning and Administration

For more information on custom Access startup commands, search for *Startup* with the Office Assistant and click on *Startup Command-Line Options*.

Password Security

As you've seen above, the full Access security model can be quite complex to implement and maintain. If you're interested only in protecting your own database from prying eyes, you can use the Database Password feature, which is a simpler way to lock up your data. This feature isn't really suitable for networked, multiuser applications, since it doesn't let you distinguish among individual users. But it can be an easy way to add some security to single-user databases.

To set a password on your database:

1. Open the database, being sure to check the Exclusive box on the File Open dialog box, and choose Tools ➤ Security ➤ Set Database Password.
2. Choose a password and type it into both the Password and Verify boxes (typing it twice is a precaution to prevent you from making an accidental mistake the first time).
3. Click on the OK button.

When you attempt to open this database in the future, you'll see the dialog box below. Enter the same password you chose in step 2 above to get into the database.
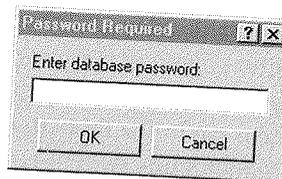
WARNING

If you ever forget your database password, all of your data will be lost forever. There's nothing anyone, including Microsoft, can do to bypass this password once it has been set. Be sure to pick something you'll remember and to record the password in a safe place.

Where to Go from Here

In this chapter we've introduced two of the most complex issues in Access: multiuser record locking and security. Now that you've learned about all the basic pieces you need to write useful Access databases, we're going to turn our attention to the elements that distinguish a finished application from just another database. Part Four shows you how to enhance your project with macros, toolbars, menus, and other tools to make your users' lives easier.

What's New in the Access Zoo?

Data sharing and security with Access 97 for Windows 95 works pretty much the same as in earlier versions of Access. The Security Wizard is now called the User-Level Security Wizard, but it works like its predecessor.
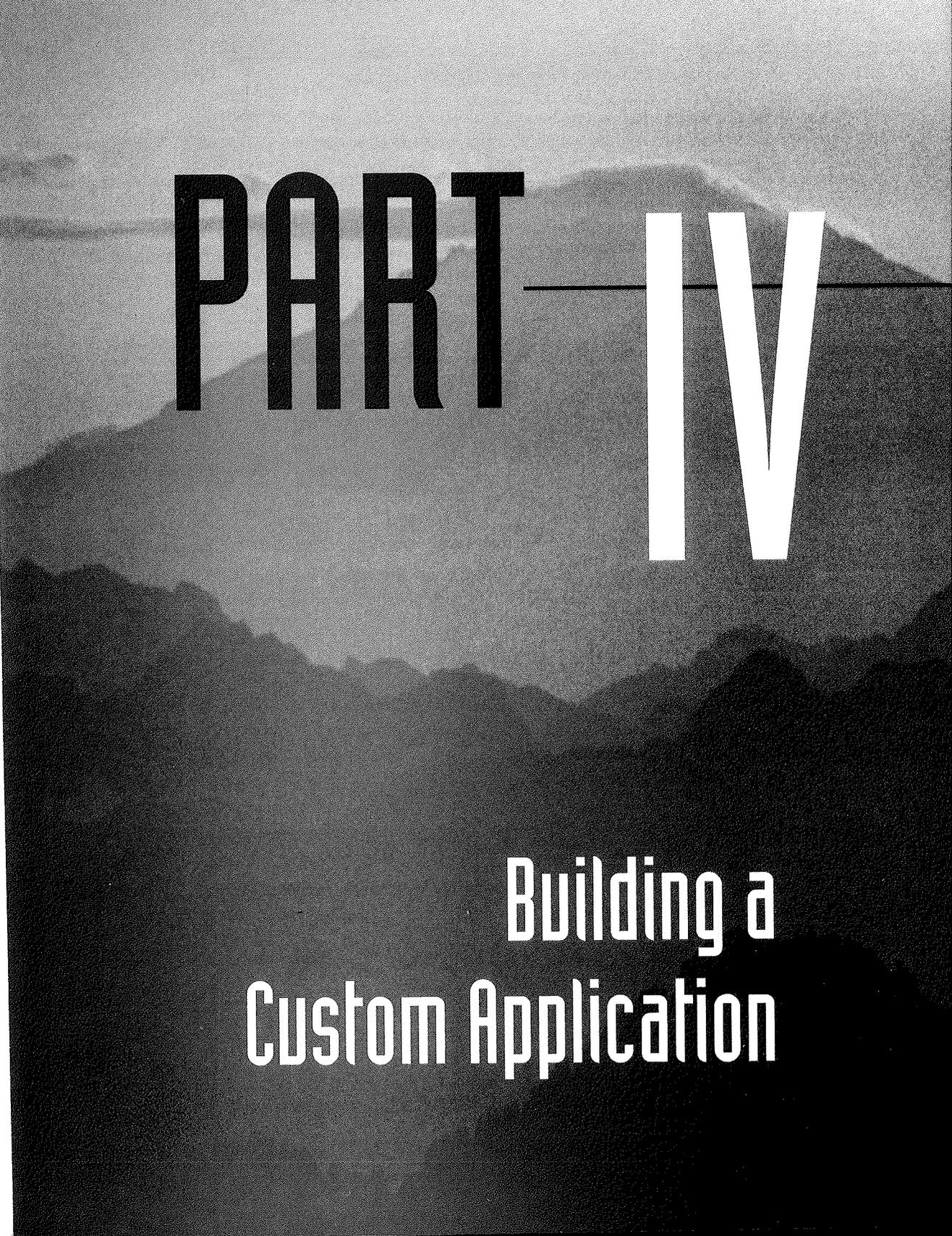
PART IV

Building a
Custom Application
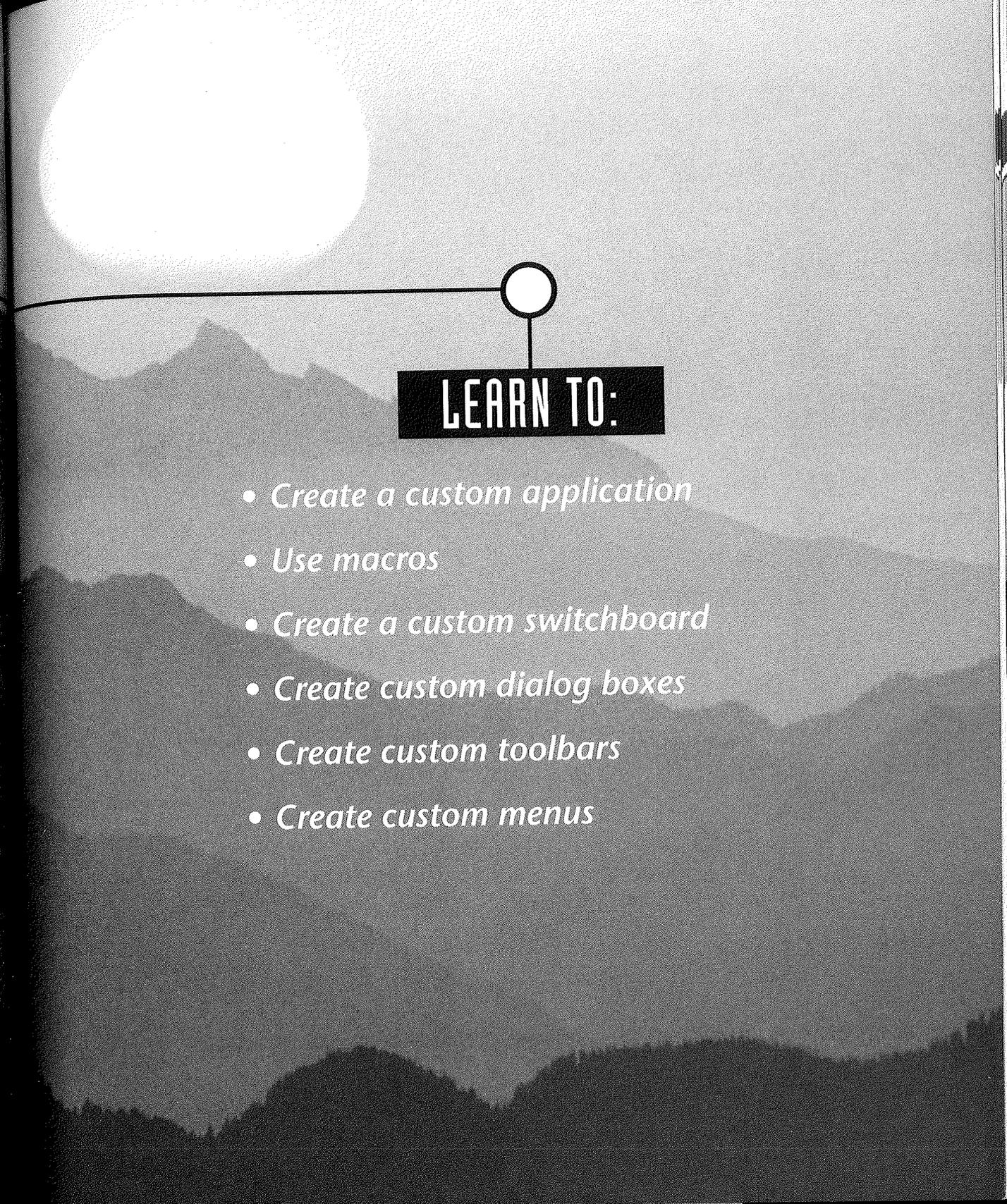
LEARN TO:

- *Create a custom application*

- *Use macros*

- *Create a custom switchboard*

- *Create custom dialog boxes*

- *Create custom toolbars*

- *Create custom menus*
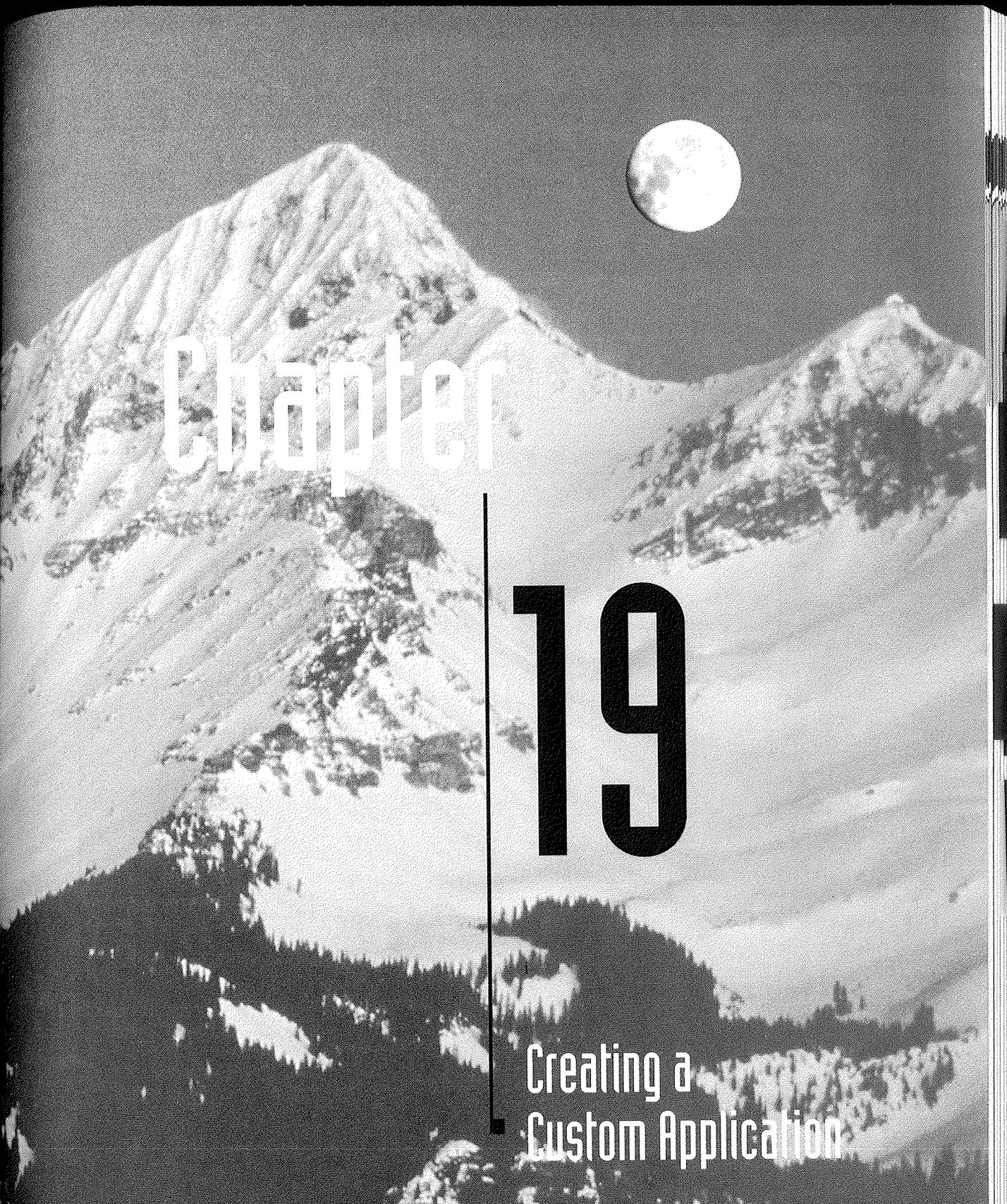
Chapter

19

Creating a
Custom Application
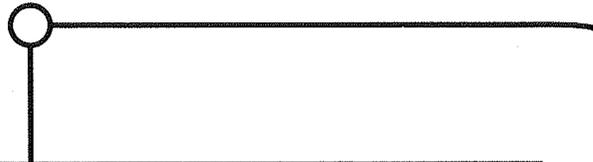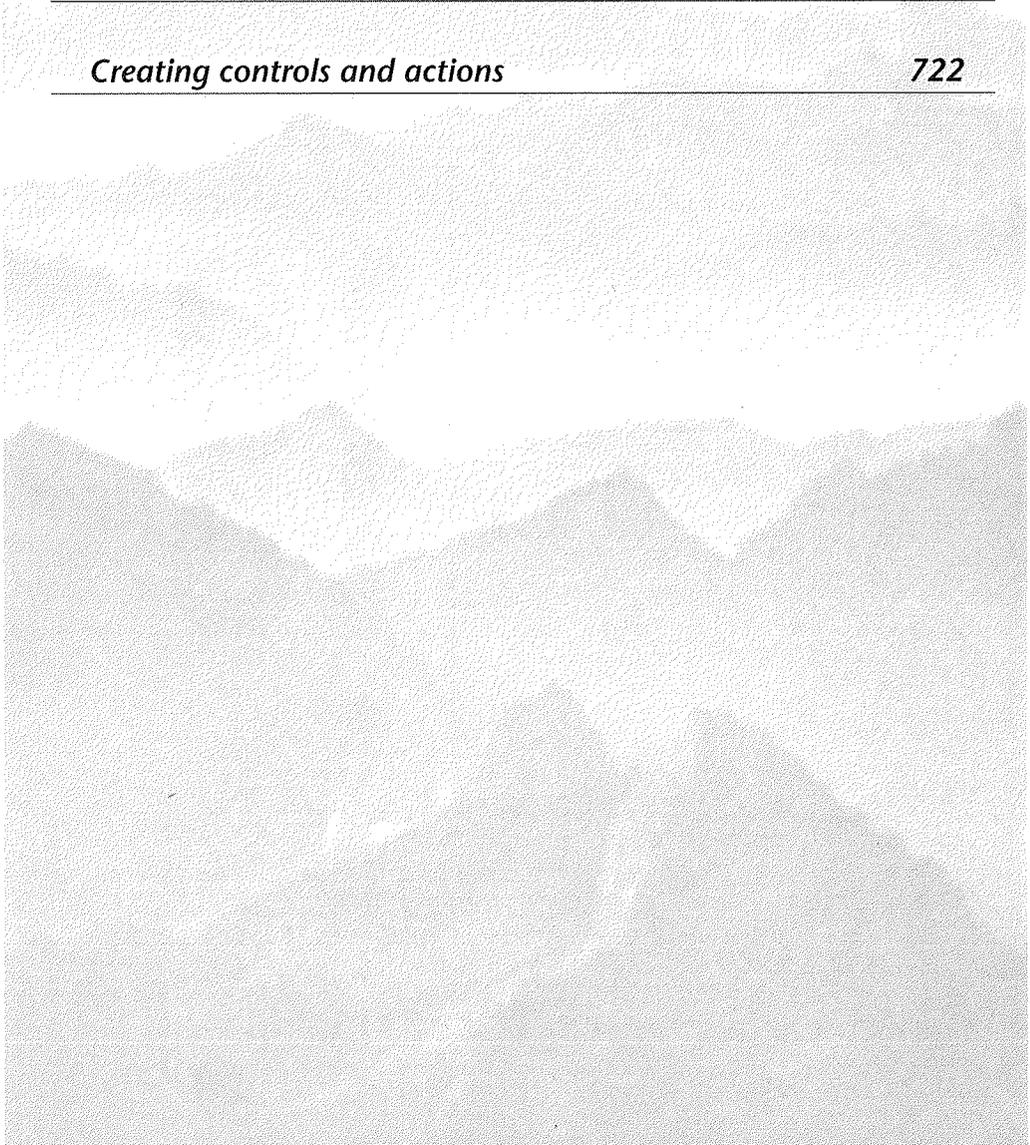
Creating a Custom Application

This chapter starts Part Four of this book, where we'll look at how to turn a database into an application (or app, for short). This chapter is also a transition for you, the reader, because you'll be going from the role of computer user to application developer. We'll explain what that's all about as we go along in this chapter.

What Is an Application?

An application is a database that's been automated, using menus, dialog boxes, and other familiar components of the Windows interface. The goal is to create a product that anyone—even people who know nothing about Microsoft Access—can use.

When you use the Database Wizard to design a database, the Wizard creates a simple application with forms, reports, and perhaps one or more switchboards. You can create much more elaborate applications than those that the Database Wizard creates by creating every database object from scratch. Or you can create all the database objects—tables, queries, forms, and reports—using the Database Wizard. Then you can create your own switchboards and dialog boxes to tie those objects together in a smooth, easy-to-use application.

Who's Who in Application Development

Before we begin our foray into applications development, you'll need to understand the terms *developer* and *user*:

Developer The person who creates the application—most likely yourself, since you're the one reading this book.

User The person, or people, who will be using the completed application. This person might be a computer neophyte.

This chapter marks your initiation into the ranks of application developers. As a developer your mission is to *create* applications that people with little or no computer experience or training can use.

How Much Programming Is Involved?

Historically, only people with advanced training and experience in computer programming were able to build custom programs (applications). But with Access, you can create very sophisticated custom applications with little or no programming. Why? Because the tables, queries, forms, and reports that you create using techniques from the preceding chapters make up at least 90 percent of the overall application.

The other 10 percent of the application will consist of hyperlinks, *macros*, and/or *Visual Basic procedures* that determine how the application behaves as the user interacts with the program. We'll talk about macros and procedures in upcoming chapters. First you need to understand *events*, which are the triggers that launch your custom macros and procedures into action.

What Are Events?

The custom applications that you create with Microsoft Access are *event driven*. In English that means that the application normally just sits there on the screen waiting for the user (the person using the mouse/keyboard) to do something. When the user does indeed do something, that action triggers an *event*, which the program then responds to.

Virtually every activity that occurs on the screen is an event. Here are some examples:

- Moving or clicking the mouse
- Pressing and releasing a key
- Moving the cursor to a control
- Changing the contents of a control
- Opening or closing a form
- Printing a report

For example, when you're using a form or switchboard and you click on a command button, your action generates a "button click" event. The application *responds* to the event by carrying out whatever *action* the command button tells the program to do. The action is defined, by you, in the form of a macro or by Visual Basic code.

Microsoft Access can detect many kinds of events. And you can assign a custom action to any one of these events. Before we talk about how to create actions, let's talk about how you go about finding the events to which you want to assign custom actions.

Finding Event Properties

You assign an action to an event by assigning a macro or procedure name to an *event property*. Every form, report, and control has its own set of events. To see the events, you need to open the form or report in design view and open the property sheet. Then Here are the exact steps:

1. Open a database and open the database window; click on the name of the form or report whose events you want to explore.
2. Click on the Design button to open that object in design view.

   - If you want to see events for the form as a whole, choose Edit ➤ Select Form or click in the square in the upper-left corner where the rulers meet.
   - If you want to see events for the report as a whole, choose Edit ➤ Select Report or click in the square in the upper-left corner where the rulers meet.
   - If you want to see events for a particular control, click on the specific control.

3. Open the property sheet (click on the Properties button or choose View ➤ Properties).

TIP

If you want to look at the events for a specific control, you can just right-click on the control and choose Properties from the shortcut menu. Then click on the Events tab.

---

4. Click on the Event tab.

The property sheet will show you all the events that you can assign actions to. The exact events that become available depend on which object is selected at the moment. For example, if you chose Edit ➤ Select Form under step 2, the property sheet would show event properties for the entire form, as in Figure 19.1.

If you click on a specific control before (or after) opening the property sheet, you'll see events for that particular control only. For example, Figure 19.2 shows the event properties for the currently selected command button, named Option1.

Event properties for an entire form.
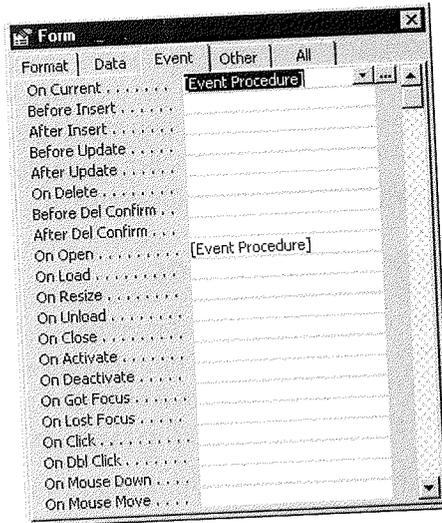
Event properties for a single control on a form.
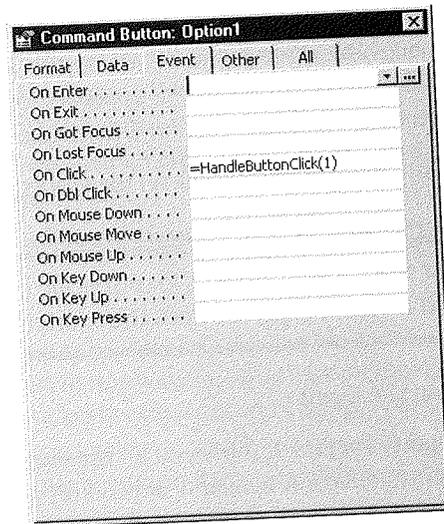
In Figures 19.1 and 19.2, you can see that some of the events have [Event Procedure] listed as the property. Behind that event procedure is the Visual Basic code that determines what happens when the event occurs. A little later in this chapter, we'll show you how to create a control and the action for that control using Control Wizards. But first, here's a quick overview of some of the many different types of events to which you can assign actions.

Sample Form Events

To see the event properties for a form as a whole, you open the form in design view, choose Edit ➤ Select Form, then open the property sheet, and select the Events tab, as we did back in Figure 19.1. You can assign actions to many events, but let's start by focusing on the events that occur when the user first opens a form. Here they are, in the order in which they occur:

Open ➤ Load ➤ Resize ➤ Activate ➤ Current

You can assign an action to any one of these events using the On Open, On Load, On Resize, On Activate, and On Current properties. But why so many different events for the simple act of opening a form? Because having lots of events to assign actions to gives you great freedom in customizing how your custom application will behave when the user opens the form. For example, you can assign an action to the On Open property and that action will play out first. You can assign a different action to the On Load event and that action will play out second. You can assign custom actions to as many, or as few, event properties as you wish.

> **TIP**
>
> As always, you can get more information about an event by clicking on the event name in the property sheet and then pressing the Help key F1.

When the user closes a form, three events occur:

Unload ➤ Deactivate ➤ Close

To assign actions to these events, you use the On Unload, On Deactivate, and On Close event properties for the form.

To illustrate just how specific you can be when assigning actions to events, let's suppose you want some special action to occur when the user switches from one open form to another. The On Open and On Close events wouldn't do you any good in this case. However, the Activate and Deactivate events do occur when switching from one open form to another, like this:

Deactivate (first form) ➤ Activate (second form)

Sample Control Events

Every control on a form has its own set of event properties to which you can assign actions. The exact event properties that are available to you depend on the type of control you're working with at the moment. For example, the event properties for a text box are different from the event properties for a combo box.

But virtually all controls have some simple events that occur when the user enters the control (by clicking on or tabbing to it). Those events properties are

Enter ➤ GotFocus

To assign actions to these events, you first need to select a specific control (still in design view), open the property sheet, and click on the Events tab, just as we did back in Figure 19.2.

When the user exits a control, these two events occur:

Exit ➤ LostFocus

Keep in mind that the events we've discussed here are just a few examples of the dozens of events that you can assign actions to. You'll see many, many more examples as we progress through this, and forthcoming, chapters. To get you started in creating your own controls and assigning actions to the events that those controls generate, we'll turn our attention now to the Control Wizards, the easiest way to create custom controls and actions.

Creating a Control and Action in One Step

The easiest way to create a control and to assign a custom action to it is via the Control Wizards, available in the forms design screen. Here are the basic steps for creating a control and action using the Control Wizards:

1. Open the form to which you want to add a control in design view.
2. Make sure the toolbox is open. (If not, click on the Toolbox toolbar button or choose View ➤ Toolbox.)
3. Make sure the Control Wizards button in the toolbox is pushed in, as shown below.

4. Click on the type of control you want to create. (The Command Button tool is a good one to cut your teeth on because it's easy to create and the Wizard offers many options.)

> **TIP**
>
> Remember, if you forget what type of control the various buttons in the toolbox create, you can just point to a button and wait for the ScreenTip to appear.

5. Click the location in the form where you want to put the control you're about to create.

6. If the control you are creating is supported by the Control Wizards, you'll see the first Wizard screen. Just follow the Wizard's instructions and make your selections as you would with any Wizard.

When you've finished, you'll see the control on your form, already selected with sizing handles in case you want to move or resize the control.

To test the new control, switch to form view. In form view, use the control as you normally would. For example, if you created a command button, just click on the command button. When you do, the action you chose while completing the Wizard will be played out.

Note that when you add a control to a form, you change the form. When you try to close the form, you'll be asked if you want to save the change. Choose Yes if you're happy with your new control and want to save it.

Using Control Wizards

Let's take a look at a specific example of using the Control Wizards to create a fairly simple control. Suppose that you used the Database Wizard to create the Order Entry database. You open up the My Company Information form (Figure 19.3) and decide that perhaps

FIGURE 19.3

We'll use the Control Wizards to add a Close button to this form.

My Company Information			
Enter your company's name and address information here. You will save the information by closing the form.			
Company	White Clover Markets	Default Terms	Net 10 days.
Address	305 - 14th Ave. S. Suite 3B	Invoice Descr	Thank you for placing your order with us.
City	Seattle		
State/Province	WA	Phone Number	(706) 555-4112
Postal Code	98128-	Fax Number	(706) 555-4115
Country	USA		
Sales Tax Rate	6.00%		

you'd like to add a command button to that form that will allow the user to close the form without clicking on the built-in Close button.

First, we need to close the form (click on its Close button), get to the database window, and reopen the form in design view. In this example we would click on the Forms tab, click on My Company Information as the name of the form to modify, and then click on the Design button. You're taken to the forms design window.

If the toolbox isn't open, click on the Toolbox button or choose View ➤ Toolbox. Then make sure the Control Wizards button in the toolbox is pushed in, as in Figure 19.4.

Now we can use the scroll bars surrounding the form to get down to the lower-right corner of the form, where we want to place the command button. We click on the Command Button tool in the toolbox and then click down near the lower-right corner of the form to place the button.

For a moment, we see an outline indicating where the button will appear. Then the Command Button Wizard kicks in automatically. The first Wizard window asks what we want this button to do. In this case we choose Form Operations under Categories and Close Form under Actions (since we want this button to close the form), as in Figure 19.5.

FIGURE 19.4

The My Company Information form in design view. The toolbox is open and the Control Wizards button is pushed in.
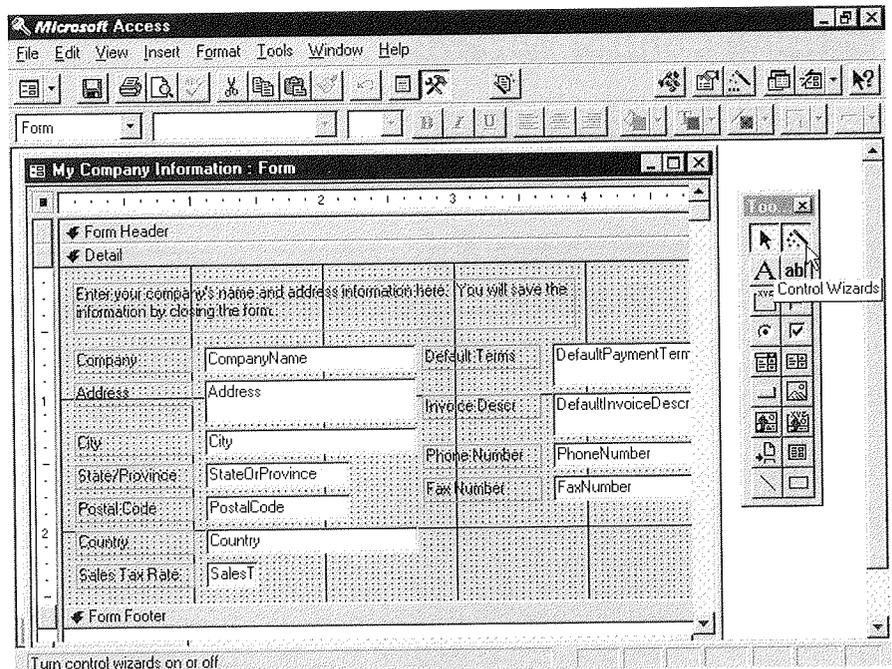
FIGURE 19.5

The first window in the Command Button Wizard asks what you want the button to do. The options are grouped into several categories.
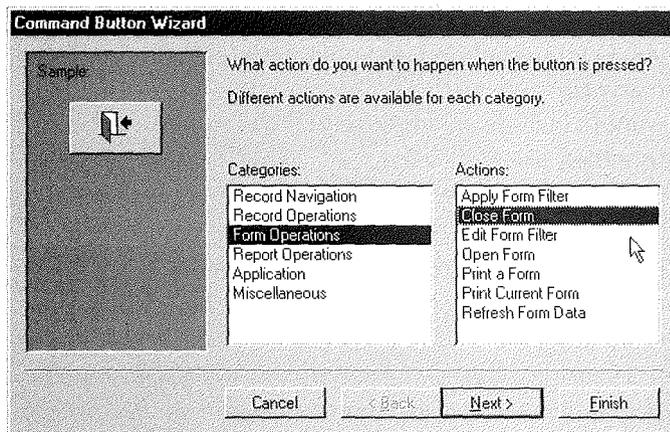
After making a selection, we click on the Next> button, and the second Wizard window asks how we want the button to look. It suggests using the Exit picture, which is a door with an arrow pointing the way out. But in this example, we decide we'd rather have the button just show the word Close (with the C underlined). So we click on the Text option button and type **&Close** in the text box, as in Figure 19.6.

FIGURE 19.6

Here we've opted to put the word Close, rather than a picture, on the command button we're creating. An ampersand in front of a letter means "underline the next letter."
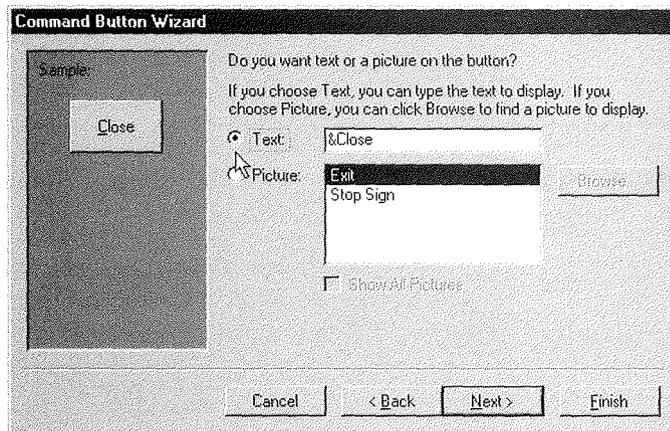
> **TIP**
>
> To underline a letter in a button's text, just put an ampersand in front of the letter you want underlined. As you'll see later in the book, the same technique applies to many controls, such as underlining hotkeys in your own custom menus. If you want to include an ampersand in the text on the button, just type two ampersands together, like this: &&.

We then press Next> to open the final Wizard window, which asks what we want to name this button. The Wizard will suggest a generic name, like Command23, but we can use a more descriptive one. In Figure 19.7 we've opted to name this button Close-CompanyInfo.

Finally, we choose Finish from the last Wizard window, and the Wizard disappears. Now we can see the new command button on the form. You can size and move this new button using the standard techniques. Figure 19.8 shows the new command button close to the lower-right corner of the form.

Now we can save the change and close the form. We can't use the new Close button to do that though because the controls you create work only in form view, not design view. So to close and save this form you can choose File ➤ Close from the menu bar or click on the form's Close button. When asked if you want to save the changes to the design of the form, choose Yes. You'll be returned to the database window.

FIGURE 19.7

Here we've opted to name the button CloseCompany-Info.

FIGURE 19.8

The new Close command button appears near the lower-right corner of the form.

Testing the New Control

To test the new control, you first need to open the form in form view (not design view). So in this example, we could just double-click on My Company Information in the database window. The form appears looking pretty much the same as it did back in Figure 19.3, except that now we can also see the new custom Close button, as in Figure 19.9.

To test the new command button, just click on it. The form should close, which is all that we wanted this particular button to do.

FIGURE 19.9

The My Company Information form in form view with the new Close button visible.

More Wizard-Created Controls

The command button to close a form is just one example of a control that you can create using Control Wizards. The Option Group, Combo Box, List Box, Command Button, and Subform/Subreport tools in the toolbox also offer Wizards to make creating those types of controls a bit easier. Your best bet is to simply experiment. Here are a few points to keep in mind as you do so:

- You can create controls only in design view.
- The Control Wizards will appear only if the Control Wizard button in the toolbox is pushed in before you start creating the control.
- If you change your mind while you are working, you can cancel the Wizard.
- If you create a control and then change your mind and want to get rid of it, just click on the control (in design view) and press Delete.
- The Control Wizards create the control and assign certain properties to it. To change the properties of a control that a Wizard has created, right-click on the control and choose Properties from the shortcut menu that appears.
- The action that a Control Wizard creates is written in Visual Basic, a topic we'll introduce in Chapter 25. If you want to take a peek at the code that the Wizard created, right-click on the control and choose Build Event from the shortcut menu that appears.
- To test the new control, you must be in form view, not design view.

Whenever you need to add a custom command button, combo box, or option group on a form, try using a Control Wizard. If you can't get the Control Wizard to create the action that you want the control to perform, your next best bet is to create a macro—the topic of our next chapter.

Where to Go from Here

Creating custom Access applications is a complex subject. Here are some pointers for finding specific topics of interest:

- To try out some custom applications, see Appendix B and Appendix C.
- To learn about using hyperlinks to a form to perform actions, see Chapter 13.
- To learn about using macros to define custom actions, see Chapter 20.
- To learn about creating custom switchboards and dialog boxes for an application, see Chapters 21 and 22.
- To learn about creating custom menus and toolbars, see Chapters 22 and 23.

What's New in the Access Zoo?

Here's what's new in application development:

- **Hyperlinks** can be used to perform actions like opening a form or report. In earlier versions of Access, you had to use a macro to perform these tasks. **New Tools/Macro commands** let you convert macros to Visual Basic, create menus from macros, create toolbars from macros, and create shortcut menus from macros.

- **The RunCommand macro action** replaces the DoMenuItem action.

- **Enhancements** to the Module window, Debug window, and Object-Browser make it easier to create Visual Basic for Applications modules.