

# The Complete Reference



## **Access 2002 Quick Reference**

This Quick Reference is intended to support your efforts in database management and database application development by supplying easily accessed, in-depth information arranged by activity. This isn't intended as a substitute for the step-by-step procedures described in the chapters in the main part of this book but, instead, as a tool for retrieving answers to specific questions.

For example, if you need help creating just the right filter to retrieve records from a table or query, refer to the "Retrieving and Distributing Information" section. If you need help with the syntax of a specific macro action, look in the "Programming with Macros and SQL" section. The following paragraphs briefly describe the contents of each section in this Quick Reference.

The first section, "Storing Information," provides details about creating the structure for storing, entering, and viewing data, including the following topics:

- Database templates available in Access 2002
- Database objects and properties
- Relationships and joins
- Tables and indexes, including data types and field properties
- Display formats and input masks

"User Interactions" addresses the ways the user can interact with Access objects to carry out actions and create forms for data management, including the following topics:

- Using built-in toolbar buttons
- Creating forms and reports, including lists of form, report, section, and control properties

"Retrieving and Distributing Information" discusses ways to extract specific records from a table by applying filters or running queries. It also includes help with creating expressions. This section includes the following specific topics:

- Filtering records
- Creating expressions
- Creating queries, including query properties, specifications, and aggregate functions
- Printing reports, including setting page options and controlling the print process

"Information Exchange" discusses the ways you can exchange information with other Access databases or other applications, including the following topics:

- Using compatible external file formats
- Setting import and export specifications

“Changing the Access Environment” describes how to alter the Access workplace with custom features, including the following topics:

- Describing the components in a Typical Office installation and components that can be added later by running Setup
- Using wizards, builders, and add-ins
- Setting default options
- Setting startup options

“Programming with Macros and SQL” discusses the basic aspects of two programming languages you can use within Access: macros and SQL. Specifically, the topics covered in this section include the following:

- Macro actions and their arguments
- SQL syntax, including statements, clauses, operations, and other elements

## Storing Information

This section contains lookup information relevant to the topics covered in Chapters 1 through 6. You can find information about such subjects as database specifications and templates; database and table properties; the definition and illustration of relationships and joins; the rules that govern table construction and field definition; and a complete inventory of toolbars, toolbar buttons, and shortcut keys.

## Database Specifications

Access places certain maximums on several database attributes. Table QR-1 lists the imposed limits.

Attribute	Maximum Permitted
File size (.mdb file)	2 gigabytes, or limited by available storage space if you have linking tables
Total number of objects in the database, including tables, queries, forms, reports, data access pages, macros, and modules	32,768 objects
<b>Table QR-1.</b> <i>Database Specifications</i>	

Attribute	Maximum Permitted
Number of modules, including the number of forms and reports with Has Module properties set to True, whether procedures exist or not	1,000 modules
Number of characters in an object name	64 characters
Number of characters in a password	14 characters
Number of characters in a user or group name	20 characters
Number of concurrent users	255 users

**Table QR-1.** *Database Specifications (continued)*

## Database Templates

Access provides ten predesigned database templates you can use to create a new database. Table QR-2 describes the contents of these database templates.

Database	Contents
Asset Tracking	Asset information with depreciation and maintenance history. Employee, department, and vendor information.
Contact Management	Contact and call information, including contact type and date.
Event Management	Event type, attendee, and registration information. Employee and pricing information.
Expenses	Employee expense reports containing expense details and categories with the employee information.
Inventory Control	Product information, including product categories, buying and selling data, and employee and customer records.

**Table QR-2.** *Predesigned Database Templates*

Database	Contents
Ledger	Complete accounting of transactions, accounts, and classification of account numbers.
Order Entry	Customer and order information with order details. Payment, product, and company information.
Resource Scheduling	Information about the scheduling of company resources, including details of the specific resources and customer activities.
Service Call Management	Information about customers and their work orders. Details of work orders include time and material costs, as well as payment information. Also includes employee and part information.
Time and Billing	Time card information for billing clients for time spent on projects. Also includes employee, client, payment, and project information.

**Table QR-2.** *Predesigned Database Templates* (continued)

## Database Objects

A *database* is an organized collection of related information used for a specific purpose. Access is an object-oriented database management program in which a database contains six types of objects:

- *Tables* contain all the data in the database and are related to form a complete source of information for an organization.
- *Queries* extract specific data from a specific set of records from one or more tables.
- *Forms* are used to view and enter data in an organized and often graphical way.
- *Reports* are used to present printed information, often grouped and organized to provide summary and analytical information.
- *Pages* are Web pages used to view, enter, or edit current data from the Web browser.
- *Macros* carry out actions in response to specific events.
- *Modules* are programs written in Visual Basic that carry out actions in response to specific events.

## Object Naming Rules

When you name an Access object, you must follow these rules:

- No two objects of the same type can have the same name in the same database.
- A table cannot have the same name as a query.
- A field, control, or object cannot have the same name as a property, built-in function, or other reserved word in the Access vocabulary.
- A name can include any combination of letters, numbers, and spaces, up to 64 characters.
- A name can include most punctuation marks, except for periods (.), exclamation marks (!), accents grave (`), and brackets ([ ]).
- A name cannot include any ASCII control characters, ASCII 00 through ASCII 31.
- If you plan to program with Visual Basic, don't include spaces in object names. You have to replace them with underscore (\_) characters in the code.

## Database Properties

Database properties are useful in locating a specific database in a large system.

Database properties fall into five categories:

- *General* properties include the filename, type, location, size, and the dates the database was created, last modified, and most recently accessed.
- *Summary* properties include descriptive information such as title, subject, author, keywords, and category, which are entered by the user and the hyperlink base for the database.
- *Statistics* properties include the same items as General properties plus editing information, such as revision number, total editing time, and the name of the user who last saved the file.
- *Contents* properties include the names of all the objects in the database grouped by type.
- *Custom* properties include 27 database properties, some of which the user can choose and set to a value that can help locate the database using the Search feature.

To set database properties, open the database and choose File | Database Properties and click the appropriate tab. Figure QR-1 shows the Summary tab of the Database Properties dialog box and Figure QR-2 shows the Custom tab.

The screenshot shows the 'Home Tech Repair Properties' dialog box with the 'Summary' tab selected. The fields are filled with the following information:

- Title: Home Tech Repair
- Subject: Customer Service Bids and Workorders
- Author: Virginia Andersen
- Manager: Richard Aaronson
- Company: Home Technical Repair Company
- Category: Small Business
- Keywords: service, repair
- Comments: This database maintains records of current bids for home technical repair such as plumbing, electrical, carpentry, painting and
- Hyperlink base: None
- Template:

Buttons at the bottom: OK, Cancel.

**Figure QR-1.** *The Summary database properties*

The screenshot shows the 'Home Tech Repair Properties' dialog box with the 'Custom' tab selected. The fields are filled with the following information:

- Name: (empty)
- Checked by: Client
- Date completed: (empty)
- Department: (empty)
- Disposition: (empty)
- Type: Text
- Value: (empty)
- Link to content: ☐

Buttons: Add, Delete.

Properties table:

Name	Value	Type
Replicate...	Yes	Yes or no
Purpose	Track Work...	Text
Checked by	Virginia	Text
Date com...	6/30/01	Text
Client	John Johnson	Text
Editor	Edward Call...	Text
Status	Ongoing	Text

Buttons at the bottom: OK, Cancel.

**Figure QR-2.** *The Custom database properties*

## Relationships and Joins

Tables in an Access database can be related in one of three different ways:

- *One-to-many*, in which one record in one table, the “parent” table, can have many matching records in a second table, the “child” table. The most common type of relationship.
- *One-to-one*, in which each record in one table has one and only one matching record in the second table. Used mostly for lookup.
- *Many-to-many*, in which many records in one table can have many matching records in a second table. Implemented in Access by creating a third table to act as a junction table between the original two with one-to-many relationships to both. The primary key in the junction table is the combination of the primary keys of the two related tables.

*Referential integrity* is a set of rules that preserve the defined relationships between tables. For example, one rule prevents the user from deleting a record from the one side of a one-to-many relationship while matching records are still in the table on the many side.

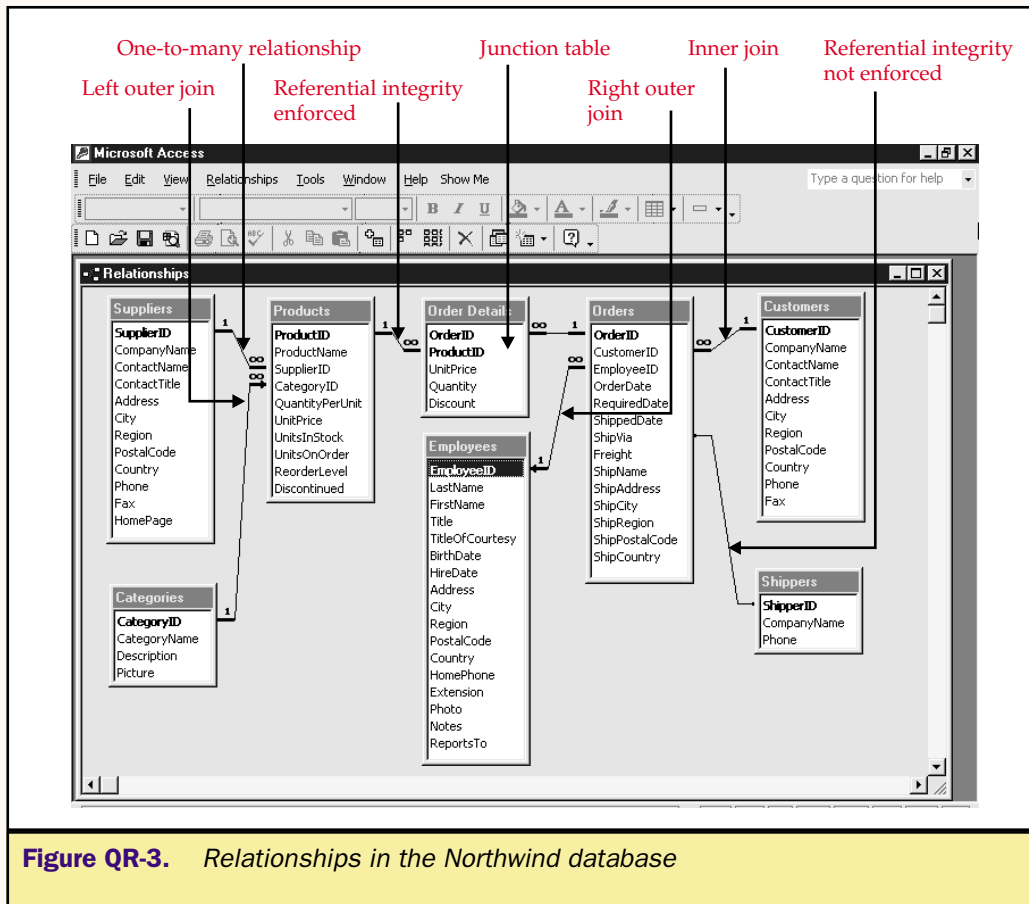
Figure QR-3 shows the relationships in the Northwind sample database. Relationship lines with the 1 and infinity ( $\infty$ ) symbols at the ends are specified to enforce referential integrity. The relationship between the Orders table and the Shippers table doesn’t enforce referential integrity, as you can see by the lack of symbols on the line. The primary keys, which ensure each record is unique, appear in bold in the table field lists.

The Order Details table is the junction table that relates the Products table to the Orders table. The primary key of the Order Details table is the combination of the OrderID (primary key field of the Orders table) and ProductID (primary key field of the Products table).

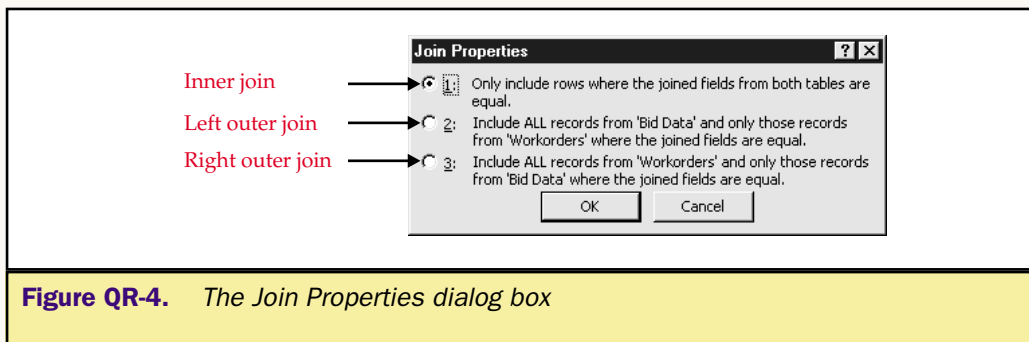
The type of join that links the related tables determines which records from each table to include in the relationship. Figure QR-4 shows the Join Properties dialog box with a choice of three types of join. The types of joins are

- *Inner join*, which includes only records where the joined fields from both tables are equal. The most common type of join. Also called *equi-join*.
- *Left outer join*, which includes all the records from the “one” side of the relation and only those records from the “many” side where the joined fields are equal.
- *Right outer join*, which includes all the records from the “many” side of the relation and only those records from the “one” side where the joined fields are equal.
- *Self join*, which allows Access to look up a field value in the same table.

The appearance of the relationship line in the Relationships window indicates the type of join. A line with no arrows indicates an inner join. The line joining the Categories table with the Products table has an arrow at the “many” end of the line, which indicates a left outer join. The relationship line between the Employees and the Orders tables shows an arrow at the “one” end of the line, which indicates a right outer join.



**Figure QR-3.** Relationships in the Northwind database



**Figure QR-4.** The Join Properties dialog box

## Table Specifications

To keep databases within limits, Access has placed certain restrictions on table characteristics. Table QR-3 describes these limitations.

## Table and Index Properties

Setting table and index properties can help maintain database integrity and screen data for viewing. Table QR-4 describes table properties and Table QR-5 describes index properties.

Attribute	Maximum Allowed
Number of characters in the table name	64 characters
Number of characters in a field name	64 characters
Number of fields	255 fields
Number of tables open at one time	2,048 or less
Table size	1 gigabyte
Number of characters in a text field	255 characters
Number of characters in a memo field	65,535 manually, 1 gigabyte programmatically
OLE Object field size	1 gigabyte
Number of indexes	32 indexes
Number of fields in one index	10 fields
Number of characters in a validation message	255 characters
Number of characters in a validation rule	2,048 characters
Number of characters in a table or field description	255 characters
Number of characters in a single record, excluding Memo and OLE Object fields	2,000 characters
Number of characters in a field property	255 characters

**Table QR-3.** *Table Specifications*

Property	Description
Default View	The view used when the table opens. Choice of Datasheet, PivotTable, or PivotChart. Default is Datasheet.
Description	A more informative description of the table than the table name. Can help identify the table and its uses. Up to 255 characters.
Filter	The filter expression saved with the table. Can be applied when table data is used as the basis for a form or report.
Link Child Fields	The field or fields in the child table that link it to the master table.
Link Master Fields	The field or fields in the master table that link it to the child table.
Order By	The sort order saved with the table. Can be applied when table data is used as the basis for a form or report.
Orientation	The reading order, alignment, and visual appearance of bidirectional text and documents. Default is Left-to-Right.
Subdatasheet Expanded	Automatically displays the subdatasheet without clicking the plus (+) sign. Default No.
Subdatasheet Height	The default height measure for displaying the subdatasheet with the master datasheet. Default 2".
Subdatasheet Name	The name of a related subdatasheet, if any. Default Auto. Also None or choose from the list of tables in the database.
Validation Rule	Defines a rule that applies to a complete record. Often used to compare values in two or more fields in the same record. Up to 2,048 characters.
Validation Text	Message displayed in the status bar when the validation rule is violated. Up to 255 characters.

**Table QR-4.** *Table Properties*

Property	Description
Field Name	Name of the field to be indexed. Choose the field name from the drop-down list.
Ignore Nulls	Set to Yes to exclude records with Null values from the index.
Index Name	Name of index. Multiple field indexes may contain up to ten fields. If left blank, the field named in Field Name column is assumed to be part of the index named previously.
Primary	Set to Yes if this index is the primary key for the table.
Sort Order	Order of indexed fields in the index. Choose Ascending or Descending.
Unique	Set to Yes if every value in the index must be unique.

**Table QR-5.** *Index Properties*

## Table Fields

Field names can contain up to 64 characters including spaces and must follow all the naming rules listed in the “Database Objects” section of this Quick Reference. Each table can contain up to 255 fields of the types described next.

## Data Types

Table QR-6 lists the nine data types provided by Access. An additional option in the Data Types drop-down list is Lookup Wizard, which you can use to create a lookup field. The data type of the lookup field must be compatible with the bound column with which it’s associated.

## Field Properties

Table QR-7 describes the field properties and Table QR-8 indicates the correlation between data types and field properties. A field property setting that requires text can include up to 255 characters.

<b>Data Type</b>	<b>Size</b>	<b>Used to Store</b>
AutoNumber	Size depends on selected field size: Long Integer—4 bytes Replication ID—16 bytes	Access-generated unique value for each record.
Currency	8 bytes	Monetary values.
Date/Time	8 bytes	Date and/or time values to be used in calculations or sorted chronologically.
Hyperlink	Up to 64,000 characters	Hyperlink address, UNC path, or URL.
Lookup	Depends on values in list	A limited list of valid values for the field. Activates the Lookup Wizard.
Memo	Up to 65,536 characters	Long and variable text relating to other field data.
Number	Size depends on selected field size: Byte—1 byte Integer—2 bytes Long integer—4 bytes Single—8 bytes Double—16 bytes ReplicationID—16 bytes Decimal—Size depends on Precision and Scale settings	Number values to be used in calculations or sorted by numeric value.
OLE Object	Up to 1 gigabyte, depending on available disk space	Objects from another source, such as graphics, sound, or a spreadsheet.
Text	Up to 255 characters	Values with combinations of letters and numbers.
Yes/No	1 bit	True or False values.

**Table QR-6.** Access Data Types

Field Property	Effect
Allow Zero Length	Differentiates between a blank field and a field containing an empty string of text (""). If set to Yes, allows an empty string, even if the Required property is also set to Yes.
Caption	Displays an alternative name for the field in datasheets, forms, reports, and data access pages.
Decimal Places	Specifies the number of digits to the right of the decimal point in a numeric field. Choose Auto to let the Format property set the number of decimal places.
Default Value	Automatically inserts the specified value in the field. Default for a Text field is an empty string; for Number or Currency, 0.
Field Size	Specifies the number of characters allowed in the field. Default is 50 for Text fields, but may be up to 255 characters. Number field size depends on Format setting. AutoNumber field size depends on New Value property setting.
Format	Determines the display appearance.
IME Mode	Sets the Input Method Editor (IME) mode for a field when focus is moved to it. IME is a program that enters East Asian text into programs by converting keystrokes into complex East Asian characters. Default No Control.
IME Sentence Mode	Sets the type of IME sentence. Default is Phrase Predict.
Indexed	Indicates the table is indexed on the field.
Input Mask	Provides a template for data conforming to a pattern and adds literal characters, if desired.

**Table QR-7.** *Description of Field Properties*

Field Property	Effect
New Values	Specifies the method of building the AutoNumber sequence.
Precision	Specifies the total number of digits to store and the total of digits on both sides of the decimal point. Applies only to number fields with Field Size property set to Decimal.
Required	Requires a value in the field. Default No.
Scale	Specifies the number of digits on the right side of the decimal point. Applies only to number fields with Field Size property set to Decimal.
Unicode Compression	Allows compression of Unicode character representation. Default Yes.
Validation Rule	Limits the field value to specific values or a range of values.
Validation Text	The text to display when the field violates the validation rule.

**Table QR-7.** *Description of Field Properties (continued)*

Property	T	M	N	D/T	C	AN	Y/N	OLE	HL
Allow Zero-Length	X	X							X
Caption	X	X	X	X	X	X	X	X	X
Decimal Places			X		X				
Default Value	X	X	X	X	X		X		X
Field Size	X		X			X			
Format	X	X	X	X	X	X	X		X
IME Mode	X	X		X					X
IME Sentence Mode	X	X		X					X

**Table QR-8.** *Field Properties and Associated Data Types*

Property	T	M	N	D/T	C	AN	Y/N	OLE	HL
Indexed	X	X	X	X	X	X	X		X
Input Mask	X		X	X	X				
New Values						X			
Precision			X						
Required	X	X	X	X	X		X	X	X
Scale			X						
Unicode Compression	X	X							X
Validation Rule	X	X	X	X	X		X		X
Validation Text	X	X	X	X	X		X		X
<b>Legend:</b> T = Text                      D/T = Date/Time                      Y/N = Yes/No M = Memo                    C = Currency                      OLE = OLE Object N = Number                  AN = AutoNumber                  HL = Hyperlink									
<b>Table QR-8.</b> <i>Field Properties and Associated Data Types (continued)</i>									

## Display Formats

The Format field property determines the appearance of the data when displayed in a datasheet, form, or report. Access provides many built-in formats for Number, Currency, and Date/Time data types. Special formatting symbols are also available for creating custom display formats. Table QR-9 describes the predefined Number, AutoNumber, and Currency format settings. Table QR-10 describes the predefined settings for Date/Time fields.

## Custom Formatting Symbols

Special symbols can be used to create custom formats for many data types. Table QR-11 describes the global symbols that can be used with all data types. Table QR-12 describes the symbols used with Number and Currency fields. Table QR-13 lists the symbols used with Date/Time fields and Table QR-14 lists those used with Text and Memo fields.

Setting	Effect
General Number	Displays number as entered. Default format for Number fields. Example: 1234.567
Currency	Displays number with currency symbol and thousands separator with a default of two decimal places. Negative values appear in parentheses. Default format for Currency fields. Example: \$1,234.56
Euro	Same as Currency, except displays with Euro currency symbol. Example: €123.45
Fixed	Displays at least one digit with a default of two decimal places. Example: 0.12
Standard	Displays thousands separator with a default of two decimal places. Example: 1,234.56
Percent	Displays value multiplied by 100 with added percent sign (%) and a default of two decimal places. Example: 12.34%
Scientific	Uses standard scientific notation with exponents. Example: 243 displays as 2.43E+02

**Table QR-9.** *Number, AutoNumber, and Currency Predefined Format Settings*

Setting	Effect
General Date	(Default format.) Combination of Short Date and Long Time settings. If no time value, displays only the date; if no date value, displays only the time. Examples: 5/21/02 3:30:00 PM (US) 21/5/02 15:30:00 (UK)
Long Date	Uses Long Date setting. Examples: Tuesday, May 21, 2002 (US) Tuesday, 21 May 2002 (UK)

**Table QR-10.** *Date/Time Predefined Format Settings*

Setting	Effect
Medium Date	Uses Medium Date setting. Example: 21-May-02
Short Date	Uses Short Date setting. Examples: 5/21/02 (US) 21/5/02 (UK)
Long Time	Uses Long Time setting. Example: 3:30:00 PM
Medium Time	Uses Medium Time setting. Example: 3:30 PM
Short Time	Uses Short Time setting. Example: 15:30

**Table QR-10.** *Date/Time Predefined Format Settings (continued)*

Symbol	Effect
!	Fills placeholders from left to right instead of right to left, forcing left alignment.
(Space)	Enters a space as a literal character when SPACEBAR is pressed.
"xyz"	Displays the characters or symbols within the quotation marks.
*	Fills available space with the character that follows.
\	Indicates the following reserved symbol or character is to be treated as a literal character.
[color]	Displays the field data in the color contained within the brackets. You can use black, blue, green, cyan, red, magenta, yellow, or white.

**Table QR-11.** *Custom Formatting Symbols Used with All Data Types*

Symbol	Effect
.	Indicates the decimal point that separates the integer and fractional parts of a number.
,	Used as the thousands separator.
0	A digit placeholder that displays a digit if one is there or zero if none.
#	A digit placeholder that displays a digit if one is there or closes up the adjoining digits if none.
\$	Displays a dollar sign.
%	Multiplies the value by 100 and adds a percent sign.
E- or e-	Displays numbers in scientific notation with a minus (-) sign before negative exponents, but no sign before positive exponents.
E+ or e+	Same as the previous except displays either plus or minus sign before the exponent.

**Table QR-12.** *Number and Currency Custom Formatting Symbols*

Symbol	Effect
:	Separates hour and minute values as set in the Windows Regional Settings Properties dialog box.
/	Separates date components.
C	Applies General Date predefined format as set in the Windows Regional Settings Properties dialog box.
d	Displays day of the month in one or two digits, as required (1 to 31).
dd	Displays day of the month in two digits (01 to 31).
ddd	Displays first three letters of the day of the week (Sun to Sat).

**Table QR-13.** *Date/Time Formatting Symbols*

Symbol	Effect
dddd	Displays full weekday name (Sunday through Saturday).
dddddd	Same as Short Date format.
dddddd	Same as Long Date format.
w	Displays day of the week by number (1 to 7).
ww	Displays week of the year by number (1 to 52).
m	Displays month in one or two digits, as needed (1 to 12).
mm	Displays month in two digits (01 to 12).
mmm	Displays first three letters of month name (Jan to Dec).
mmmm	Displays full name of the month (January to December).
q	Displays quarter of the year (1 to 4).
y	Displays number of the day in the year (1 to 366).
yy	Displays last two digits of year (01 to 99).
yyyy	Displays full year (0100 to 9999).
h, n, s	Displays hour, minute, or second in one or two digits, as needed (0 to 23, 1 to 59).
hh, nn, ss	Displays hour, minute, or second in two digits (01 to 23, 01 to 59).
ttt	Same as Long Time.
AM/PM, am/pm	Displays 12-hour clock with two-character uppercase or lowercase designators.
A/P, a/p	Displays 12-hour clock with one-character uppercase or lowercase designators.
AMPM	Displays 12-hour clock with morning/afternoon designators, as specified in Windows Regional Settings Properties dialog box.

**Table QR-13.** *Date/Time Formatting Symbols (continued)*

Symbol	Effect
@	Indicates a character or a space is required.
&	Indicates a character or a space is optional.
<	Converts all characters that follow to lowercase.
>	Converts all characters that follow to uppercase.

**Table QR-14.** *Text and Memo Formatting Symbols*

## Custom Format Strings

Custom Number and Currency format strings can contain up to four sections, each applying to a different type of value. The sections are separated by semicolons.

- The first section specifies the format for positive numbers.
- The second section specifies the format for negative numbers.
- The third section specifies the format for zero values.
- The fourth section specifies the format for Null values.

For example, the custom currency format

L 1-1

```
$#,##0.00 [blue]; ($#,##0.00) [red]; "Zero"; "No value"
```

displays positive values in blue, negative values in red, and enclosed in parentheses, the word “Zero” for zero values, and “No value” for Null values. Both positive and negative values display at least one digit to the left of the decimal point and two digits to the right.

Date/Time format strings can also combine the special formatting symbols with text to produce custom display formats. Spaces, commas, and other literal characters must be enclosed in quotation marks. For example, the format string:

L 1-2

```
"Today is " dddd ", " mmm d ", " yyyy " in week number " ww
```

applied to the value 11/2/02 displays

L 1-3

```
Today is Saturday, Nov 2, 2002 in week number 44
```

## Input Masks

*Input masks* display literal characters in the field with fill-in blanks before any data is entered. They ensure the data entered can fit in the format you specify. Many predefined input masks are available for Text and Date fields by using the Input Mask Wizard or you can create your own custom input mask. If you want an input mask for a Number or Currency field, you must enter the string directly in the field Input Mask property in the table design.

The symbols used in an input mask can specify the type of character to be entered in that position and also indicate whether the entry is required. Table QR-15 describes the input mask symbols. Some of the symbols have the same usage as in a format string.

Input mask strings can contain up to three sections separated by semicolons:

- The first contains the mask itself.
- The second determines whether to store the literal characters with the data. Enter 0 in this section to store the literal characters with the data; enter 1 or leave blank to store only the characters entered in the fill-in spaces.
- The third specifies the character to use as the blank fill-in spaces in the displayed mask. For example, type "+" to use plus signs in place of the default underline character. If you want to leave the fill-in spaces blank, type " " (with a space between the double quotation marks).

For example, the following input mask string can be used in a ZIP code field to require the first five characters, provide for the four additional optional characters, store the hyphen with the data, and display plus signs in the fill-in spaces:

L 1-4

00000-9999;0;"+"

Symbol	Entry	Entry Required?
0	Digit (0 through 9) with no + or – sign. Blanks display as zeros.	Yes
9	Digit with no + or – sign. Blanks display as spaces.	No
#	Same as 9, but allows +/– signs.	No
L	Letter.	Yes

Table QR-15. Input Mask Symbols

Symbol	Entry	Entry Required?
?	Letter.	No
A	Letter or digit.	Yes
a	Letter or digit.	No
&	Any character or space.	Yes
C	Any character or space.	No
.,:;- /	Decimal placeholder, thousands separator, date and time separators.	N/A
<	Converts letters to lowercase.	N/A
>	Converts letters to uppercase.	N/A
!	Input mask displays from right to left, rather than from left to right. Characters typed into the mask fill it from left to right. Symbol can appear anywhere in the mask.	N/A
\	Next character is treated as a literal.	N/A
Password	Creates a password entry box. Characters typed in the text box are stored as entered, but displayed as asterisks (*).	N/A















**Table QR-15.** *Input Mask Symbols (continued)*

## User Interactions














This section begins by describing the built-in toolbar buttons. Subsequent paragraphs detail form, report, and data access page specifications and properties, followed by detailed lists of control types and their properties.

### Built-in Toolbars














Access provides more than 20 built-in toolbars for use with databases that automatically display as you work in different windows. Some toolbar buttons, such as the Cut, Copy, and Paste buttons appear on more than one toolbar. Table QR-16 illustrates the toolbar buttons you commonly use. Additional, more advanced buttons can be found on the PivotTable and PivotChart toolbars.

Button	Name	What It Does
	New	Opens the New dialog box to start a new database.
	Open	Opens the Open dialog box to start an existing database.
	Save	Saves the current object.
	Search	Opens the Basic Search pane you can use to help locate a file.
	Print	Sends the current object directly to the printer.
	Print Preview	Opens the current or selected object in Print Preview.
	Spelling	Starts spell checking of the text fields in the selected or current object.
	Cut	Places the currently selected object or text on the clipboard.
	Copy	Copies the currently selected object or text to the clipboard.
	Paste	Pastes the contents of the clipboard to the position of the insertion point in the current document.
	Undo	Reverses recent actions.
	Redo	Repeats reversed action.
	OfficeLinks	Displays a drop-down list of links to other Office programs.
	Analyze	Displays a drop-down list of table and performance analysis tools and the Database Documenter.














**Table QR-16.** *Built-in Toolbar Buttons*

Button	Name	What It Does
	Visual Basic Editor	Opens the Visual Basic Editor window showing the code for the form or report currently appearing in Design view.
	Microsoft Script Editor	Opens the Microsoft Script Editor where you can view or edit the HTML code for a Web page.
	Large Icons	Displays the object names in the Database window in rows accompanied by large object type icons.
	Small Icons	Displays the object names in the Database window in rows accompanied by small object type icons.
	List	Displays the object names in the Database window as a columnar list.
	Details	Displays the objects in the Database window with other related information.
	Delete	Deletes the currently selected object in the Database window. Prompts for confirmation before deleting the object.
	Properties or Format (Object)	Opens the property sheet for the currently selected object or control. Displays the Format dialog box for the selected object in the Graph window.
	Relationships	Displays the Relationships window for the current database.
	New Object: AutoForm	Creates a new AutoForm for the currently selected or active table or query.
	Microsoft Access Help	Starts the Office Assistant, if you haven't disabled it, or opens the Help window.
	More Buttons	Displays a list of buttons currently appearing in the toolbar with the option of deleting individual buttons or adding more buttons.
	Show Direct Relationships	Displays only the tables in the Relationships window directly related to the currently selected table.













**Table QR-16.** *Built-in Toolbar Buttons (continued)*

Button	Name	What It Does
	Show All Relationships	Displays all established relationships defined in the current database.
	Clear Layout or Clear Grid	Removes all tables from the Relationships window or all entries from the Filter By Form grid.
	View (Design)	Switches to table, query, form, report, or page Design view.
	Sort Ascending	Sorts records in a datasheet or form in ascending order of current field.
	Sort Descending	Sorts records in a datasheet or form in descending order of current field.
	Filter By Selection	In a datasheet or form, displays only the records with matching values in one field.
	Filter By Form	Opens the Filter By Form grid for creating a filter.
	Remove Filter	Removes the applied filter from records in a datasheet or form.
	Apply Filter	Applies a filter to the records in a datasheet or form.
	Find	Opens the Find and Replace dialog box.
	New Record	Moves insertion point to new record at the end of a datasheet or in a form.
	Delete Record	Deletes current record.
	Database Window	Displays the Database window.













**Table QR-16.** *Built-in Toolbar Buttons (continued)*

Button	Name	What It Does
	Go To Field	Displays a drop-down list of field names in the current datasheet. In a form, report, or page design button displays a list of elements of the design for selection.
	Font	Displays a drop-down list of available fonts from which to choose.
	Font Size	Displays a drop-down list of font sizes from which to choose or enter a font size number.
	Bold	Toggles bold appearance for selected text or begins adding bold for new text.
	Italic	Toggles italic appearance for selected text or begins adding italic for new text.
	Underline	Toggles underlining for selected text or begins adding underlining for new text.
	Fill/Back Color	Displays a palette of colors for a datasheet or chart background or for selected objects in form and report designs.
	Font/Fore Color	Displays a palette of colors for text in a datasheet or selected objects in form and report designs.
	Line/Border Color	Displays a palette of colors to apply to datasheet gridlines or to the selected objects in a report or form design.
	Gridlines	Displays, hides, or changes the appearance of the gridlines in a datasheet.
	Special Effect	Displays a palette of special effects for applying to a datasheet or controls in a form or report design.
	Load From Query	Loads a query design into the Filter By Form grid.
	Save As Query	Saves the current Filter By Form design as a separate query object.














**Table QR-16.** Built-in Toolbar Buttons (continued)

Button	Name	What It Does
	View (Datasheet)	Switches from table or query Design view to Datasheet view.
	Primary Key	Sets the currently selected field or fields in table design as the primary key.
	Indexes	Opens the Indexes dialog box in a table Design window.
	Insert Rows	Inserts one or more rows in a table or macro design.
	Delete Rows	Deletes selected row or rows from a table or macro design.
	Build	Opens one of the Access Builders: Field Builder from table Design view; Expression builder from query, form, or report Design view; Code Builder or Macro Builder from form or report Design view.
	Query Type	Displays a drop-down list of query types for a new query.
	Run	Runs the current query or macro.
	Show Table	Opens the Show Table dialog box with a list of tables and queries in the current database.
	Totals	Adds or removes the Totals row in a query design grid.
	Top Values	Displays a drop-down list of quantities and percentages for limiting the query results to a specific range of values.
	New Object: Table	Opens the New Table dialog box.















**Table QR-16.** *Built-in Toolbar Buttons (continued)*

Button	Name	What It Does
	View (Form)	Switches to Form view.
	Format Painter	Copies the formatting from one control to another.
	Insert Hyperlink	Opens the Insert Hyperlink dialog box for specifying the hyperlink address and other features.
	Field List	Displays the field list box for the underlying record source of a form, report, or page design.
	Toolbox	Displays the Toolbox toolbar.
	Auto Format	Opens the AutoFormat dialog box for selecting or customizing form or report styles.
	Select Objects	Enables you to add controls to a form, report, or page design using the control buttons on the Toolbox toolbar.
	Control Wizards	When pressed, starts the appropriate Control Wizard when the control is added to a form, report, or page design.
	Label	Adds a label control to a form, report, or page design.
	Text Box	Adds a bound or unbound text box control to a form, report, or page design.
	Option Group	Adds an option group control to a form, report, or page design. Starts the Option Group Wizard if the Control Wizard's button is pressed.
	Toggle Button	Adds a toggle button to a form or report design.















**Table QR-16.** *Built-in Toolbar Buttons (continued)*

Button	Name	What It Does
	Option Button	Adds an option button to a form, report, or page design.
	Check Box	Adds a check box to a form, report, or page design.
	Combo Box	Adds a combo box to a form, report, or page design. Starts the Combo Box Wizard if the Control Wizard's button is pressed.
	List Box	Adds a list box to a form, report, or page design. Starts the List Box Wizard if the Control Wizard's button is pressed.
	Command Button	Adds a command button to a form, report, or page design. Starts the Command Button Wizard if the Control Wizard's button is pressed.
	Image	Opens the Insert Image dialog box for adding an image control to a form, report, or page design.
	Unbound Object Frame	Adds an unbound object frame to a form or report design.
	Bound Object Frame	Adds a bound object frame to a form or report design.
	Page Break	Adds a page break to a form or report design.
	Tab Control	Adds a tab control to a form design.
	Subform/ Subreport	Adds a subform to a form or a subreport to a report design. Starts the Subform or Subreport Wizard if the Control Wizard's button is pressed.
	Line	Enables you to draw a line to a form, report, or page design.
	Rectangle	Enables you to draw a rectangle in a form, report, or page design.















**Table QR-16.** *Built-in Toolbar Buttons (continued)*

Button	Name	What It Does
	More Controls	Opens a list containing more controls available for a form, report, or page design.
	Bound Span	Adds a bound Span control that you can use to display data from a field in the database or the results of an expression.
	Scrolling Text	Displays moving or scrolling text. Also called a <i>marquee</i> .
	Expand	Adds a control that expands and collapses groups of records in a page.
	Record Navigation	Adds a record navigation bar with record management and navigation buttons.
	Office PivotTable	Adds a PivotTable based on a current Access or SQL Server database from an external data source.
	Office Chart	Adds an Office Chart control to a page with help from the Chart Wizard.
	Office Spreadsheet	Add an Office spreadsheet control to provide many of the capabilities of Excel.
	Hotspot Image	Adds an image that displays another Web page when you click it by means of an inserted hyperlink.
	Movie	Inserts an animated movie file.
	E Mail Recipient	Starts Access e-mail message program for sending the data access page to a recipient.
	Promote	Groups records in a page based on values in the selected table or query field.
	Group By Table	Groups records on the table or query on the “one” side of a relationship.
	Demote	Removes the group level from the page.













**Table QR-16.** Built-in Toolbar Buttons (continued)

Button	Name	What It Does
	Align Left	Aligns selected text at the left margin or begins left alignment.
	Center	Aligns selected text horizontally in the center of the page or begins center alignment.
	Align Right	Aligns selected text at the right margin or begins right alignment.
	Line/Border Width	Displays a drop-down list of seven line widths to apply to the selected control.
	Zoom	Zooms into or out of a portion of the preview.
	One Page	Displays one page in Print Preview window.
	Two Pages	Displays two pages in Print Preview window.
	Multiple Pages	Displays up to 20 pages in Print Preview window.
	Zoom	Increases or decreases magnification of a form or report in Print Preview window.
	Sorting and Grouping	Opens the Sorting and Grouping dialog box in report Design view.
	Import File	Imports data from Excel or Lotus 1-2-3 or a text file.
	View Datasheet	Switches to the underlying table or query Datasheet window.
	By Row	Displays the data series in rows on a chart.
	By Column	Displays the data series in columns on a chart.









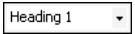





**Table QR-16.** Built-in Toolbar Buttons (continued)

Button	Name	What It Does
	Data Table	Adds data to the grid at the bottom of the chart.
	Chart Type	Displays a palette of chart types.
	Category Axis Gridlines	Displays gridlines on a chart upward from the Category (X) axis.
	Value Axis Gridlines	Displays gridlines across a chart from the Value (Y) axis.
	Legend	Displays the legend with a chart.
	Drawing	Opens the Drawing window.
	Currency Style	Adds currency symbols to the selected axis numeric values.
	Percent Style	Adds percent signs to the selected axis numeric values.
	Comma Style	Uses commas as the thousands separator.
	Increase Decimal	Adds one decimal place to the right of the decimal point.
	Decrease Decimal	Removes the rightmost decimal place.
	Angle Clockwise	Tilts selected text downward 45 degrees.
	Angle Counter-clockwise	Tilts selected text upward 45 degrees.
	Macro Names	Displays the Macro Names column in the macro design.

**Table QR-16.** Built-in Toolbar Buttons (continued)

Button	Name	What It Does
	Conditions	Displays the Conditions column in the macro design.
	Single Step	Runs the current macro, one action at a time.
	View Microsoft Access	Toggles between Access and the active Visual Basic document.
	Insert Module	Inserts a new module, a class module, or a stored procedure into the current module.
	Run Sub/ User Form	Runs the current procedure if the cursor is in a procedure, runs the active UserForm, or runs a macro if no procedure or UserForm is active.
	Break	Stops running the current program and switches to Break mode.
	Reset	Resets the project and clears the execution stack.
	Design Mode	Toggles Design mode off and on.
	Project Explorer	Displays the Project Explorer, which displays a hierarchical list of the currently open projects and their contents.
	Object Browser	Displays the Object Browser, which lists the object libraries, the type library, classes, methods, properties, events, and constants you can use in code, as well as the modules and procedures you already defined for your project.
	Back	Returns to the previous Web page.
	Forward	Moves back to the Web page in which you clicked Back.

**Table QR-16.** *Built-in Toolbar Buttons (continued)*

Button	Name	What It Does
	Stop	Stops downloading the Web page.
	Refresh	Updates the current page.
	Start Page	Displays the start or home Web page.
	Search the Web	Starts your Internet search engine.
	Favorites	Enables you to open or add to the Favorites folder. Also displays a list of favorite folders.
	Go	Opens a menu list of options, including some actions initiated by other Web toolbar buttons.
	Show Only Web Toolbar	Removes all other toolbars from the screen.
	Address	Enters or selects a destination Web address.
	Style	Opens a list of data access page styles.
	Decrease Indent	Decreases the amount text is indented in a data access page.
	Increase Indent	Increases the amount text is indented in a data access page.
	Numbering	Adds numbers to a textual list in a data access page.
	Bullets	Adds bullets to a textual list in a data access page.
	Align Left	Aligns selected controls with left-most control in form, report, or page design.

**Table QR-16.** Built-in Toolbar Buttons (continued)







Button	Name	What It Does
	Align Right	Aligns selected controls with right-most control in form, report, or page design.
	Align Top	Aligns selected controls with top-most control in form, report, or page design.
	Align Bottom	Aligns selected controls with bottom-most control in form, report, or page design.
	Size Height	Enables you to increase or decrease the height of a control.
	Size Width	Enables you to increase or decrease the width of a control.
	Size Height/ Width	Enables you to change the height and width of a control at the same time.

Table QR-16. Built-in Toolbar Buttons (continued)

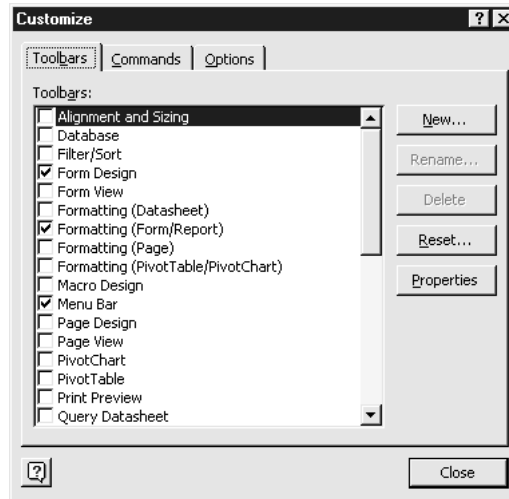
The specific built-in toolbar that appears automatically depends on the current activity. You can display any additional toolbars by right-clicking an empty spot on a toolbar and choosing **Customize** or choosing **Tools | Customize**. Then select the one you want from the **Toolbars** tab of the **Customize** dialog box (see Figure QR-5) and choose **OK**. (When you check an additional toolbar, the **Close** button changes to **OK**.)

## Form and Report Design

Designing a form or report is a process of adding controls of various types to the design and setting properties that determine the behavior and appearance of the form or report itself, as well as the controls in the design. The following sections are devoted to describing the properties of forms and reports, of their individual sections, and of the controls in the forms and reports. The properties are grouped by the same categories as in the property sheets and are listed in alphabetical order within each group. Default values and settings, if any, appear in bold.

### Form and Report Specifications

Certain limitations apply to forms and reports, such as the number of characters in a label, the height of a section, and the number of printed pages in a report. Table QR-17 lists the form and report attributes together with their maximum capacities.



**Figure QR-5.** *The Toolbars tab of the Customize dialog box*

### Attribute

### Maximum Capacity

Number of characters in a label	2,048 characters
Number of characters in a text box	65,535 characters
Form or report width	22 inches (55.87 centimeters)
Section height	22 inches (55.87 centimeters)
Height of all sections, including section headers	200 inches (508 centimeters)
Number of nested for or report levels	7 levels
Number of fields or expressions sorted on or grouped by	10 fields or expressions
Number of headers and footers in a report	1 report header/footer, 1 page header/footer, 10 group headers/footers
Number of printed pages in a report	65,536 pages

**Table QR-17.** *Form and Report Specifications*

Attribute	Maximum Capacity
Total number of controls and sections added to a form or report	754 controls and sections
Number of characters in a SQL statement used as the Record Source or as the Row Source for a control	32,750 characters

**Table QR-17.** *Form and Report Specifications* (continued)

## Form and Report Format Properties

Table QR-18 describes the Format properties of forms and reports that determine the object's appearance on the screen or when printed.

Property	Description	Applies To	Allowed Values*
Allow Form View	Permits Form view.	Forms	Yes/No
Allow Datasheet View	Permits Datasheet view.	Forms	Yes/No
Allow PivotChart View	Permits PivotChart view.	Forms	Yes/No
Allow PivotTable View	Permits PivotTable view.	Forms	Yes/No
Auto Center	Centers the form automatically on screen.	Forms and reports	Yes/No
Auto Resize	Resizes form to display a complete record.	Forms and reports	Yes/No
Border Style	Sets the form window border style.	Forms and reports	None, Thin, Sizable, Dialog

**Table QR-18.** *Form and Report Format Properties*

Property	Description	Applies To	Allowed Values*
Caption	Text that appears in title bar.	Forms and reports	Text optional
Close Button	Displays or hides the Close button (X).	Forms and reports	Yes/No
Control Box	Displays or hides the control menu.	Forms and reports	Yes/No
Default View	Specifies the Default view.	Forms	<b>Single Form,</b> Continuous Forms, Datasheet, PivotTable, PivotChart
Dividing Lines	Displays or hides dividing lines between records in Form view.	Forms	Yes/No
Grid X	Number of subdivisions per unit of measurement on the horizontal grid.	Forms and reports	Integer 1 through 64, default <b>24</b> .
Grid Y	Number of subdivisions per unit of measurement on the vertical grid.	Forms and reports	Integer 1 through 64, default <b>24</b> .
Grp Keep Together	Specifies whether to keep groups together by page or by column in a multiple column report.	Reports	<b>Per Column,</b> Per Page
Layout for Print	Uses printer fonts in design.	Forms and reports	<b>No</b> default for forms, <b>Yes</b> default for reports.

**Table QR-18.** *Form and Report Format Properties* (continued)

Property	Description	Applies To	Allowed Values*
Min Max Buttons	Displays or hides one or both min/max buttons.	Forms and reports	None, Min Enabled, Max Enabled, <b>Both Enabled</b>
Moveable	Permits moving object about the screen.	Forms and reports	<b>Yes/No</b>
Navigation Buttons	Displays or hides navigation buttons.	Forms	<b>Yes/No</b>
Orientation	Enables right-to-left features if using language version of Office.	Forms and reports	<b>Left-to-Right/Right-to-Left</b>
Page Footer	Determines which report pages show the page footer information.	Reports	<b>All Pages</b> , Not with Rpt Hdr, Not with Rpt Ftr, Not with RptHdr/Ftr
Page Header	Determines which report pages show the page header information.	Reports	Same as Page Footer
Palette Source	Chooses the palette of colors to use in the design.	Forms and reports	<b>(Default)</b> or valid path or filename.
Picture	Path or filename of picture to use as form or report background.	Forms and reports	<b>(none)</b> , path, or filename.
Picture Alignment	Aligns the picture in the frame.	Forms and reports	Top Left, Top Right, <b>Center</b> , Bottom Left, Bottom Right, Form Center (forms only)

**Table QR-18.** *Form and Report Format Properties* (continued)

Property	Description	Applies To	Allowed Values*
Picture Pages	Determines which pages show the background picture.	Reports	<b>All Pages</b> , First Page, No Pages
Picture Size Mode	Controls how the contents of the object frame or graph are displayed.	Forms and reports	<b>Clip</b> , Stretch, Zoom
Picture Tiling	Tiles the picture in the frame.	Forms and reports	Yes/ <b>No</b>
Picture Type	Links or embeds the background picture.	Forms and reports	<b>Embedded</b> , Linked
Record Selectors	Displays or hides record selectors.	Forms	<b>Yes</b> / <b>No</b>
Scroll Bars	Displays or hides scroll bars.	Forms	Horizontal Only, Vertical Only, <b>Both</b> , Neither
Subdatasheet Height	Specifies the default height of an expanded subdatasheet.	Forms	Height in inches
Subdatasheet Expanded	Automatically displays all subdatasheets expanded.	Forms	Yes/ <b>No</b>
What's This Button	Shows question mark button in title bar.	Forms	Yes/ <b>No</b>
Width	Width of all sections.	Forms and reports	Width in unit of measure set in Regional Settings.
* Default settings indicated in boldface.			
<b>Table QR-18.</b> <i>Form and Report Format Properties</i> (continued)			

## Form and Report Data Properties

The data properties of both forms and reports determine the source of the data to be used in the object and specify any filter or sort order. In addition, the form data properties specify the types of actions the user may perform on the data in the form. Table QR-19 describes these properties.

Property	Description	Applies To	Allowed Values*
Allow Additions	Permits or prohibits adding new records.	Forms	Yes/No
Allow Deletions	Permits or prohibits deleting records.	Forms	Yes/No
Allow Edits	Permits or prohibits editing records.	Forms	Yes/No
Allow Filters	Permits or prohibits filtering records.	Forms	Yes/No
Commit On Close	Accepts the edits when the form closes.	Forms	Yes/No
Data Entry	Opens form only for adding new records. Existing records are not displayed.	Forms	Yes/No
Fetch Defaults	Retrieves default values.	Forms	Yes/No
Filter	Filter expression automatically loaded with form or report.	Forms and reports	Any valid filter expression
Filter On	Applies filter at report startup.	Reports	Yes/No
Order By	Sort order automatically loaded with form or report.	Forms and reports	Valid field name

**Table QR-19.** *Form and Report Data Properties*

Property	Description	Applies To	Allowed Values*
Order By On	Applies sort order at report startup.	Reports	Yes/No
Record Locks	Determines whether and how records in the underlying record source are locked.	Forms	<b>No Locks</b> , All Records, Edited Record
Record Source	Table, query, or SQL statement on which the form or report is based.	Forms and reports	Table or query name or valid SQL statement
Recordset Type	Determines which tables may be edited.	Forms	<b>Dynaset</b> , Dynaset (Inconsistent Updates), Snapshot
* Default option indicated in boldface.			
<b>Table QR-19.</b> <i>Form and Report Data Properties (continued)</i>			

## Form and Report Event Properties

All event properties relate to an event that can occur to the object or control. For example, the On Current event property setting determines the behavior of the form or report when it becomes active. Event properties specify the action to take when the event occurs. The action is in the form of an expression, a macro, or a Visual Basic event procedure. Event properties have no default or allowed values.

Table QR-20 lists the event properties that apply to forms and reports.

### Note

*Additional event properties apply exclusively to forms in interactive PivotTable or PivotChart views.*

## Form and Report Other Properties

The properties listed on the Other tab of a form property sheet include settings you can use to create pop-up forms and dialog boxes. Other properties specify custom menu bars, shortcut menus, or toolbars to be used with the form or report. Table QR-21 describes these properties.

Property	When Event Occurs	Applies To
After Del Confirm	After responding Yes or No to the deletion confirmation message.	Forms
After Final Render	After the final generation of the graphical preparation of data.	Forms (PivotChart)
After Insert	After a new record has been added to the database.	Forms
After Layout	After the data is arranged in the PivotChart.	Forms (PivotChart)
After Render	After generating the graphical representation of the data.	Forms (PivotChart)
After Update	After the data in a control or record is updated.	Forms
Before Del Confirm	After one or more records are deleted, but before the confirmation message appears.	Forms
Before Insert	When new data is typed into a new record, but before the record is added to the database.	Forms
Before Query	Before running the query that extracts data for the form.	Forms (PivotTable)
Before Render	Before generating the graphical image from the data.	Forms (PivotChart)
Before ScreenTip	When mouse pointer moves to object, but before ScreenTip is displayed.	Forms (PivotTable/ PivotChart)
Before Update	Before a control or record is updated with modified data.	Forms
Key Preview	Specifies the form-level keyboard event procedures are invoked before the control-level keyboard event procedures.	Forms

**Table QR-20.** *Form and Report Event Properties*

Property	When Event Occurs	Applies To
On Activate	Object becomes active by opening or clicking it or by clicking a control on a form.	Forms, reports
On Apply Filter	Apply a filter to or remove a filter from the data in the form by one of the filter methods.	Forms
On Click	Press and release the left mouse button on a record selector, or outside a section or control on a form.	Forms, form sections
On Close	Form or report is closed and no longer appears on the screen.	Forms, reports
On Current	Focus moves to a record and it becomes current.	Forms
On Dbl Click	Press and release the left mouse button twice on a record selector, or outside a section or control on a form.	Forms, form sections
On Deactivate	A different Access window replaces the form or report as the active window, but before it becomes the active window.	Forms, reports
On Delete	A record is deleted, but before the deletion is confirmed and actually carried out.	Forms
On Dirty	A record has been modified, but not yet saved.	Forms
On Error	A Microsoft Jet Database Engine error occurs.	Forms, reports
On Filter	The Filter By Form or Advanced Filter/Sort window opens.	Forms

**Table QR-20.** *Form and Report Event Properties* (continued)

Property	When Event Occurs	Applies To
On Format	Access determines what data goes in each report section, before the section is formatted for preview or print.	Report sections
On Got Focus	A control on the form receives focus, or a form with no active or enabled controls receives focus.	Forms
On Key Down	Press any key when the form has focus or send a keystroke with a macro or a VB procedure.	Forms
On Key Press	Press and release a key or key combination when the form has focus.	Forms
On Key Up	Release a pressed key when a form has focus.	Forms
On Load	A form is opened and records appear on the screen.	Forms
On Lost Focus	A form loses focus.	Forms
On Mouse Down	Press the left mouse button.	Forms, form sections
On Mouse Move	Move the mouse pointer over a form or form section.	Forms, form sections
On Mouse Up	Release the mouse button while the pointer is on a form or form section.	Forms, form sections
On Mouse Wheel	When the mouse wheel moves on the screen.	Forms

**Table QR-20.** *Form and Report Event Properties* (continued)

Property	When Event Occurs	Applies To
On No Data	After Access formats a report for preview or print and discovers the report is based on an empty recordset.	Reports
On Open	A form opens, but before the first record is displayed. A report opens, but before printing begins.	Forms, reports
On Page	After a report is formatted, but before printing.	Reports
On Print	After section data is formatted, but before printing.	Report sections
On Record Exit	Just before the record becomes no longer current.	Forms
On Resize	The size of a form changes or when the form is first displayed and expanded to its previously saved size.	Forms
On Retreat	Access has to back up one or more report sections to perform additional formatting passes.	Report sections except page header/footer
On Timer	Time interval specified in the Time Interval property has expired.	Forms
On Undo	All edits on the form are reversed.	Forms
On View Change	The current view changes.	Forms (PivotTable)
On Unload	Form is closed and records are unloaded, but before it leaves the screen.	Forms
Timer Interval	Sets the length of time for the form's Timer event.	Forms

**Table QR-20.** *Form and Report Event Properties (continued)*

Property	Description	Applies To	Allowed Values*
Allow Design Changes	Gives the user the capability to make design changes in any view.	Forms	<b>All Views,</b> Design View Only
Cycle	Specifies how the TAB key behaves when reaching the last control on the current record.	Forms	<b>All Records,</b> Current Record, Current Page
Date Grouping	Specifies how to group date values.	Reports	<b>Use System Settings,</b> U.S. Default
Fast Laser Printing	Allows replacing lines and rectangles with text character lines.	Forms and reports	<b>Yes/No</b>
Has Module	Object has a Visual Basic class module.	Forms and reports	<b>Yes/No</b>
Help Context ID	Identifies Help topic within the custom Help file.	Forms and reports	Long integer value representing the context ID of the custom Help topic. <b>0</b> is default
Help File	Specifies custom Help file.	Forms and reports	Path and filename of a custom Help file
Menu Bar	Names a custom menu bar or menu macro.	Forms and reports	Name of custom menu bar
Modal	Keeps form in focus until closed.	Forms	<b>Yes/No</b>

**Table QR-21.** *Form and Report Other Properties*

Property	Description	Applies To	Allowed Values*
Pop Up	Defines the form as a pop-up form that remains on top of other windows.	Forms and reports	Yes/No
Record Locks	Locks records while the report is printing.	Reports	<b>No locks</b> , All Records
Shortcut Menu	Allows display of shortcut menu in Browse mode by right-clicking.	Forms	<b>Yes</b> /No
Shortcut Menu Bar	Displays custom shortcut menu bar or menu-bar macro.	Forms and reports	Name of command bar whose Type property is Popup or the name of the macro
Tag	Any extra information about the form or report.	Forms and reports	<b>"" (zero-length string)</b> , any string up to 2,048 characters.
Toolbar	Displays a custom toolbar when the form or report opens.	Forms and reports	Name of the custom toolbar
* Default option indicated in boldface.			
<b>Table QR-21.</b> <i>Form and Report Other Properties</i> (continued)			

## Form and Report Section Properties

Each section of a form or report has specific properties that govern its appearance and behavior. Forms and reports both have a detail section, header and footer sections, and page header and footer sections. Reports can also have group header and footer sections with some unique properties. Table QR-22 describes the section properties. Refer to Table QR-20 for a list of the form and report section event properties.

Property	Description	Applies To	Allowed Values*
Back Color	Sets the background color.	All sections	Any standard or custom color number
Can Grow	Expands the section vertically when printed to accommodate entire record.	All sections except Page Header and Footer	Yes/ <b>No</b>
Can Shrink	Shrinks the section vertically when printed to eliminate blank lines.	All sections except Page Header and Footer	Yes/ <b>No</b>
Display When	Specifies when to show section.	Form Detail, Header and Footer	<b>Always</b> , Print Only, Screen Only
Force New Page	Specifies where to begin printing the section.	All sections except Page Header and Footer	<b>None</b> , Before Section, After Section, Before & After
Height	Height of section in the design.	All sections	Height in inches or in unit of measure set in Regional Settings
Keep Together	Keeps all information in the section on one page.	All sections except Page Header and Footer	Yes/ <b>No</b>
Name	Identifier name assigned to the section used by expressions, macros, and procedures.	All sections	A string expression up to 64 characters. Must conform to Access naming conventions. Default is section name.

**Table QR-22.** *Form and Report Section Properties*

Property	Description	Applies To	Allowed Values*
New Row Or Col	Specifies where to start printing the section in a multiple-column layout.	All sections except Page Header and Footer	<b>None</b> , Before Section, After Section, Before & After
Repeat Section	Repeats the section at top of each page.	Group Header	Yes/ <b>No</b>
Special Effect	Gives section a 3-D appearance.	All sections	<b>Flat</b> , Raised, Sunken
Tag	Any extra information about the form or report.	All sections	<b>"" (zero-length string)</b> , any string up to 2,048 characters.
Visible	Displays or hides the section.	All sections	<b>Yes</b> / <b>No</b>

\* Default option indicated in boldface.

**Table QR-22.** *Form and Report Section Properties (continued)*

## Dialog Box and Pop-up Form Property Settings

By setting a certain combination of form properties, you can create a pop-up form to display information or a dialog box, which can receive user input. Most of the form properties are set to remove any data manipulation capability, such as selecting or navigating through records. Because pop-up forms and dialog boxes don't contain record data, these properties aren't necessary.

You also shouldn't permit the user to maximize or minimize the form, or to switch to Datasheet view. To require user input to close the box—even if it is only to cancel the form—remove the Close button (the one with the X). You can leave the Control Menu box as an emergency exit, especially during form design. Setting the form's Border Style removes the Close button, but retains the Control Menu.

Table QR-23 lists the relevant properties and their settings.

## Controls and Control Properties

Most of the control properties can be set in the control's property sheet. Others can be set only by using a macro or a Visual Basic procedure. This section describes the control properties that can be specified in the property sheet and indicates the controls to which they apply.

Property	Setting	Purpose
Allow Form View	Yes	Keeps the form in Form view. Sets the other Allow view properties to No.
Auto Center	Yes	Centers the form automatically when it opens. If you want the form to appear in a special place, set to No.
Border Style	Dialog	Form has a thick border and includes only a title bar with a Control Menu box.
Caption	Prompt for user input or other helpful text	Displays text in title bar in Form view instead of form name.
Control Box	Yes	Displays the control-menu box in the title bar in Form view, so the user can close the form.
Dividing Lines	No	Removes horizontal lines from the form.
MinMax Buttons	None	Prevents the user from resizing the form in Form view.
Modal	Yes	Form retains focus until it's closed.
Navigation Buttons	No	Removes navigation buttons from the form.
PopUp	Yes	Form remains on top of other windows.
Record Selectors	No	Removes record selectors from the form.
Scroll Bars	Neither	Removes scroll bars from the form.

**Table QR-23.** *Form Property Settings for Pop-up Forms and Dialog Boxes*

### Note

*If you want to know more about a property, click the property box on the property sheet and press F1.*

Several properties apply to all controls in both forms and reports:

- The Height and Width properties determine the dimensions of the control and apply to all controls except page breaks. The size is measured in inches or in the unit of measure specified in the Regional Settings Properties dialog box.
- The Left and Top properties determine the placement of the control in the form or report design relative to the upper-left corner of the window. This doesn't apply to page breaks, which use the same unit of measure as the Height and Width properties.
- All controls have the Name property, which specifies an identifier used by expressions, macros, and Visual Basic procedures. The default is the control name followed by an integer, for example, Label4.
- All controls have the Tag property, which contains additional information about the control. The tag is a string expression containing up to 2,048 characters. The default value is a zero-length string.
- The Visible property applies to all controls, except page breaks, and specifies whether the control is shown or hidden. The default is Yes.
- The Display When property applies to all controls on forms except tab pages. The property determines when the control is displayed: Always (default), Print Only, Screen Only.
- Five event properties concerning mouse activities apply to all controls except subforms, subreports, and lines: On Click, On Dbl-Click, On Mouse Down, On Mouse Move, On Mouse Up, and On Mouse Wheel. The MouseDown event occurs when the left mouse button is pressed and the MouseUp event occurs when the button is released. The MouseMove event occurs when the mouse pointer is moved over a control. The MouseWheel event occurs when the wheel is used to move the pointer. The two click events apply to standalone option buttons and check boxes only, not to controls in an option group.
- No event properties are associated with Page Break or Line controls.

Some of the user-interaction properties can be applied only to controls in form designs, but not in report designs. Table QR-24 lists the remaining control properties and identifies the controls to which they apply.

Property	Description <sup>1</sup>	Applies To
Add Colon <sup>2</sup>	<b>Yes/No.</b> Automatically adds a colon after the attached label text.	Default property setting for all controls except labels, images, unbound object frames, tabs, rectangles, and lines
Allow AutoCorrect	<b>Yes/No.</b> Entries are automatically corrected according to settings in the AutoCorrect dialog box.	Text boxes, combo boxes
Asian Line Break	<b>Yes/No.</b> Applies Asian word wrapping feature.	Text boxes
Auto Activate	Specifies how to activate an OLE Object: Manual, <b>Double-Click</b> , or Get Focus.	Unbound object frames, bound object frames
Auto Expand	<b>Yes/No.</b> Automatically fills in value that matches characters typed in a combo box.	Combo boxes
Auto Label <sup>2</sup>	<b>Yes/No.</b> Labels are automatically created and attached to new controls.	Default property setting for all controls except labels, images, unbound object frames, tabs, rectangles, and lines
Auto Repeat	<b>Yes/No.</b> Runs an event procedure or macro repeatedly while the button is pressed in.	Command buttons
AutoTab	<b>Yes/No.</b> Tabs to next tab stop when last allowable character in input mask is entered in a text box control.	Text boxes (forms)

**Table QR-24.** Control Properties

Property	Description <sup>1</sup>	Applies To
Back Color	Specifies the color of the interior or background of a control.	Labels, text boxes, option groups, combo boxes, list boxes, images, unbound object frames, bound object frames, rectangles
Back Style	Normal/Transparent. Specifies whether a control is transparent or shows the color specified by Back Color. Normal is default for combo box, tabs, unbound and bound object frame controls. Transparent is default for label, text box, option group, image, and rectangle controls.	Labels, text boxes, option groups, combo boxes, images, unbound object frames, bound object frames, tabs, rectangles
Border Color	A numeric expression that specifies the color of the control's border. 0 is default.	All controls except toggle buttons, command buttons
Border Style	Specifies the appearance of the control's border. Choices include Transparent, Solid, and a variety of dots and dashes. Transparent is the default for some controls, while Solid is the default for others.	All controls except toggle buttons, command buttons
Border Width	Specifies the width of the control's border. <b>Hairline</b> or a choice of 1-6 pts.	All controls except toggle buttons, command buttons
Bottom Margin	Specifies bottom margin for text within a control.	Labels, text boxes

**Table QR-24.** *Control Properties (continued)*

Property	Description <sup>1</sup>	Applies To
Bound Column	In a multicolumn control, specifies which column is bound to the underlying field specified in the Control Source property. <b>1</b> is default.	Combo boxes, list boxes
Can Grow	Yes/ <b>No</b> . Expands vertically so all data can be printed or previewed.	Text boxes, subforms/subreports
Can Shrink	Yes/ <b>No</b> . Shrinks vertically so data can be printed or previewed without blank lines.	Text boxes, subforms/subreports
Cancel	Yes/ <b>No</b> . Specifies the button pushed when the user presses ESC.	Command buttons
Caption	Specifies the text to display on the control. Default is control name followed by an index number. For example, Label1.	Labels, toggle buttons, command buttons, pages
Class	Specifies the class of an embedded OLE Object.	Unbound object frames, bound object frames
Column Count	Specifies the number of columns to display in a multicolumn control or to send to an OLE Object.	Combo boxes, list boxes, unbound object frames
Column Heads	Yes/ <b>No</b> . Displays field names from the underlying record source as the column heads.	Combo boxes, list boxes, unbound object frames

**Table QR-24.** *Control Properties (continued)*

Property	Description <sup>1</sup>	Applies To
Column Widths	Specifies width in inches of each column in a multicolumn control, separated by semicolons. 0 setting hides the column.	Combo boxes, list boxes
Control Source <sup>3</sup>	Specifies the data to appear in the control.	Text boxes, option groups, toggle buttons, option buttons, check boxes, combo boxes, list boxes, bound object frames
ControlTip Text	Specifies text to display when the mouse pointer rests on a control. Applies only to controls in forms.	All controls except tabs, subforms/subreports, lines, rectangles
Decimal Places	<b>Auto.</b> Specifies the number of digits to the right of the decimal point in numeric fields.	Text boxes, combo boxes
Default	Yes/ <b>No.</b> Specifies the button pressed when the user presses ENTER.	Command buttons
Default Value <sup>3</sup>	Specifies the value to be assigned to the Control Source when a new record is added in Form view.	Text boxes, option groups, toggle buttons, option buttons, check boxes, combo boxes, list boxes
Display Type	<b>Content</b> /Icon. Specifies whether the OLE Object displays the contents or only an icon.	Unbound object frames, bound object frames
Enabled	<b>Yes</b> /No. Specifies that a control can have focus. Applies only to controls on forms.	All controls except labels, images, lines, rectangles, pages

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
Enter Key Behavior	Specifies behavior of ENTER key: <b>Default</b> (as specified under Move After Enter on the Keyboard tab of the Options dialog box) or New Line in Field, which adds a new line and stays in the text box.	Text boxes on forms only
Filter Lookup	Never/ <b>Database Default</b> /Always. Specifies whether values appear in control when using the Filter By Form window.	Text boxes
Font Italic	Yes/ <b>No</b> . Text in control is italicized.	Labels, text boxes, toggle buttons, combo boxes, list boxes, command buttons, tabs
Font Name	Specifies font style for text in control.	Labels, text boxes, toggle buttons, combo boxes, list boxes, command buttons, tabs
Font Size	Specifies font size for text in control. <b>10</b> default for command buttons, <b>8</b> default for all others.	Labels, text boxes, toggle buttons, combo boxes, list boxes, command buttons, tabs
Font Underline	Yes/ <b>No</b> . Text in control is underlined.	Labels, text boxes, toggle buttons, combo boxes, list boxes, command buttons, tabs
Font Weight	<b>Normal</b> . Specifies thickness of text in control from Thin to Heavy.	Labels, text boxes, toggle buttons, combo boxes, list boxes, command buttons, tabs

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
Fore Color	Numeric value specifying the color of the text in control. <b>0</b> (black) is default.	Labels, text boxes, toggle buttons, combo boxes, list boxes, command buttons
Format	Specifies format for displaying numbers, dates, times, and yes/no values.	Text boxes, combo boxes
Help Context ID	Identifier for Help topic in a custom Help file. Numbers start with 0. Applies only to controls in forms.	All controls except subforms/subreports, lines, rectangles
Hyperlink Address	Path or URL to target document.	Command buttons, images
Hyperlink Subaddress	Location within Hyperlink Address target document.	Command buttons, images
IME Hold	Yes/ <b>No</b> . Keeps the setting of the IME mode for this field or control after the focus is moved away.	Text boxes, list boxes, combo boxes
IME Mode	Sets the IME mode you want to set when focus is moved to the control or field. <b>No Control</b> , On, Off, Disable, and four other options.	Text boxes, list boxes, combo boxes
IME Sentence Mode	Sets the IME sentence when focus moves to a control or field. <b>Phrase Predict</b> , Plural Clause, Conversation, None.	Text boxes, list boxes, combo boxes
Input Mask	Contains a pattern for data entered in the control.	Text boxes, combo boxes
Is Hyperlink	Yes/ <b>No</b> . Identifies control as hyperlink.	Text boxes, combo boxes

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
Keyboard Language	Overrides the keyboard language currently in use. <b>System</b> , English, or one of the foreign character sets.	Text boxes, combo boxes
Label Align <sup>2</sup>	Aligns text within attached label of a new control. Options are <b>General</b> , Left, Center, Right or Distribute.	Default property setting for all controls except labels, images, unbound object frames, tabs, rectangles, and lines
Label X <sup>2</sup>	Sets the horizontal placement of the attached label with respect to the upper-left corner of a new control. -1" places the label one inch to the left of the control.	Default property setting for all controls except labels, images, unbound object frames, tabs, rectangles, and lines
Label Y <sup>2</sup>	Sets the vertical placement of the attached label with respect to the upper-left corner of the control. 0" places the label on the same level as the new control.	Default property setting for all controls except labels, images, unbound object frames, tabs, rectangles, and lines
Left Margin	Specifies left margin for text within a control.	Labels, text boxes
Limit To List	Yes/ <b>No</b> . Prohibits (Yes) or allows (No) entered text that doesn't match a value in the list.	Combo boxes
Line Slant	Slants line from upper left to lower right (\) or from upper right to lower left (/).	Lines
Line Spacing	Specifies the line spacing for text within a control.	Labels, text boxes

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
Link Child Fields	Specifies field name(s) in the subordinate object.	Unbound object frames, subforms/subreports
Link Master Fields	Specifies field name(s) in the main form or report.	Unbound object frames, subforms/subreports
List Rows	Specifies the maximum number of rows to display in the drop-down list. Default is 8.	Combo boxes
List Width	<b>Auto.</b> Specifies the width of the drop-down list part of the combo box.	Combo boxes
Locked	Yes/ <b>No</b> . Prevents (Yes) or allows (No) editing data in controls in Form view.	All controls except labels, command buttons, images, lines, rectangles
Multi Row	Yes/ <b>No</b> . Allows tab control to display more than one row of tabs. If No, tabs are truncated to fit in a single row.	Tabs
Multi Select	<b>None</b> /Simple/Extended. Specifies whether user can make more than one selection in a list box and how to do it.	List boxes
Numerical Shapes (Arabic only)	Offers different representations of digit shapes. <b>System</b> , Arabic, National, Context.	Labels, text boxes, list boxes, combo boxes
OLE Class	Automatically set to a description of the OLE Object contained in the frame.	Unbound object frames
OLE Type	Determines whether the frame contains an OLE Object and whether it's embedded or linked.	Unbound object frames

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
OLE Type Allowed	Specifies the type of OLE Object the frame can contain: Linked, Embedded, or <b>Either</b> .	Unbound object frames, bound object frames
Option Value	Specifies the value to return when an option is selected. Applies only to controls in forms.	Option buttons, check boxes (in option groups only)
Page Index	Specifies the page position in the page collection in a tab control.	Pages
Picture	Path or filename for graphic to be loaded into control. Default is <b>(none)</b> .	Toggle buttons, command buttons, images, pages
Picture Alignment	Specifies the alignment of the image within the frame. Top Left, Top Right, <b>Center</b> , Bottom Left, Bottom Right.	Images
Picture Tiling	Yes/ <b>No</b> . Specifies whether picture is tiled across the entire image control.	Images
Picture Type	Specifies graphic as embedded or linked.	Toggle buttons, command buttons, images, pages
Reading Order	Determines the reading order of the control. <b>Context</b> , Left-to-Right, Right-to-Left.	Labels, text boxes, command buttons, check boxes, list boxes, combo boxes, option buttons, toggle buttons
Right Margin	Specifies right margin for text within a control.	Labels, text boxes
Row Source	Works with Row Source Type property to specify the table, query, SQL statement, field list, or value list as the row source.	Combo boxes, list boxes, unbound object frames

**Table QR-24.** *Control Properties* (continued)

Property	Description <sup>1</sup>	Applies To
Row Source Type	Specifies type of row source: <b>Table/Query</b> , Value List, or Field List.	Combo boxes, list boxes, unbound object frames
Scrollbar Align	Places the vertical scrollbar on the right or left of the screen, based on the text orientation. <b>System</b> , Right, or Left.	Text boxes, list boxes, combo boxes
Scroll Bars	<b>None</b> or Vertical. Displays or hides vertical scroll bar in Form view.	Text boxes
Shortcut Menu Bar	Specifies the name of a global custom shortcut menu to display when the control is right-clicked.	All controls except labels, subforms/subreports, lines, rectangles
Size Mode	Controls how the contents of the object frame or the image are displayed. <b>Clip</b> , Stretch, Zoom.	Images, unbound object frames, bound object frames
Source Doc	Specifies the file to create a link to or to embed in the frame.	Unbound object frames, bound object frames
Source Item	Specifies the data within the Source Doc file to be linked when you create a linked OLE object.	Unbound object frames, bound object frames
Source Object	Identifies the form or report that is the source of the subform or subreport.	Subforms/subreports
Special Effect	Creates a 3-D appearance. Flat, Raised, Sunken, Etched, Shadowed, or Chiseled. Default depends on control type.	All controls except toggle buttons, command buttons, pages

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
Status Bar Text	Specifies text to display in the status bar when the control is selected in Form view.	All controls except labels, images, lines, rectangles
Subdatasheet Height	2" Specifies the maximum height for an expanded subdatasheet.	Standalone subforms, subreports
Subdatasheet Expanded	Yes/ <b>No</b> . Displays subdatasheets automatically expanded with datasheet.	Standalone subforms, subreports
Style	Determines the tab style: <b>Tabs</b> , Buttons, or None.	Tabs
Tab Fixed Height	Specifies tab height. Default 0", which sizes tabs to fit contents.	Tabs
Tab Fixed Width	Specifies tab width. Default 0", which sizes tabs to fit contents.	Tabs
Tab Index <sup>3</sup>	Specifies control's place in the tab order on a form. Tab order begins with 0.	All controls except labels, option buttons, check boxes, images, lines, rectangles, pages
Tab Stop	<b>Yes</b> /No. Determines whether you can use TAB to move focus to a control in Form view.	All controls except labels, images, lines, rectangles, pages
Text Align	Determines placement of text in a control: <b>General</b> aligns text to the left, numbers and dates to the right. Left, Center, and Right options align all data types the same.	Labels, text boxes, combo boxes

**Table QR-24.** Control Properties (continued)

Property	Description <sup>1</sup>	Applies To
Top Margin	Specifies right margin for text within a control.	Labels, text boxes
Transparent	Yes/ <b>No</b> . Specifies the command button as solid or transparent.	Command buttons
Triple State <sup>3</sup>	Yes/ <b>No</b> . Specifies how a check box, toggle button, or option button displays Null values. If Yes, Null values appear dimmed. If No, Null values appear as a No value.	Toggle buttons, check boxes
Update Options	Specifies how a linked OLE object is updated. <b>Automatic</b> or Manual.	Unbound object frames, bound object frames
Validation Rule <sup>3</sup>	Specifies requirements for data entered into a control in Form view. If control is in an option group, the rule applies only to the group, not to individual options.	Text boxes, option groups, toggle buttons, option buttons, check boxes, combo boxes, list boxes
Validation Text <sup>3</sup>	Specifies text to display when the validation rule is violated in Form view.	Text boxes, option groups, toggle buttons, option buttons, check boxes, combo boxes, list boxes
Verb	Specifies the index number of the operation to perform when an OLE object is activated.	Unbound object frames, bound object frames
Vertical	Yes/ <b>No</b> . Displays characters vertically from top to bottom and right to left in control.	Labels, text boxes
<sup>1</sup> Default property settings indicated in boldface.		
<sup>2</sup> Can be set only as default control properties.		
<sup>3</sup> Does not apply to controls within option groups, only to standalone controls.		

**Table QR-24.** Control Properties (continued)

Table QR-25 lists the event properties that apply to form and report controls, and describes when the events occur.

Property	When Event Occurs	Applies To
*After Update	After the data in a control is updated.	Text boxes, option groups, toggle buttons, option buttons, check boxes, combo boxes, list boxes, bound object frames
*Before Update	Before a control is updated with modified data.	Text boxes, option groups, toggle buttons, option buttons, check boxes, combo boxes, list boxes, bound object frames
On Change	The content of a control changes.	Text boxes, combo boxes, tabs
On Dirty	A record has been modified, but not yet saved.	Text boxes, combo boxes
*On Enter	Before a control receives focus from another control or the first control in a newly opened form.	All controls except images, tabs, rectangles, pages
*On Exit	Before a control loses focus to another control on the same form.	All controls except images, tabs, rectangles, pages
On Got Focus	Control receives focus.	All controls except option groups, images, tabs, rectangles, pages, subforms/subreports
On Key Down	Press any key when control has focus.	All controls except option groups, images, unbound object frames, subform/subreports, tabs, rectangles, pages

**Table QR-25.** *Control Event Properties*

Property	When Event Occurs	Applies To
On Key Press	Press and release a key or key combination when control has focus.	All controls except option groups, images, unbound object frames, subform/subreports, tabs, rectangles, pages
On Key Up	Release a pressed key when control has focus.	All controls except option groups, images, unbound object frames, subform/subreports, tabs, rectangles, pages
On Lost Focus	Control loses focus.	All controls except option groups, images, tabs, rectangles, subforms/subreports, pages
On Not in List	User types an entry that isn't in the combo box list of values.	Combo boxes
On Undo	All edits in the form have been reversed.	Text boxes, combo boxes
On Updated	An OLE object's data has been updated by the source program.	Unbound and bound object frames
* Does not apply to controls within option groups, only to the groups themselves.		
<b>Table QR-25.</b> <i>Control Event Properties</i> (continued)		

## Retrieving and Distributing Information

The whole purpose of organizing and storing data is so you can quickly and efficiently retrieve only the information you want in the desired arrangement. After the data is filtered and sorted, it can be used as the basis for forms and reports to distribute outside the computer system.

## Filtering Records

Filtering records limits the records in the datasheet, form, or report. Access provides five methods of filtering records:

- *Filter By Selection* leaves only the records with the same value as the one you selected in a field in one of the records.
- *Filter Excluding Selection* leaves only the records that don't include the same value as the one you selected in one of the records.
- *Filter By Form* screens records using the criteria you enter into a table skeleton.
- *Filter For Input* displays a box where you enter the filter criteria directly.
- *Advanced Filter/Sort* gives you, in addition to filtering, the capability to sort the records by two or more fields using different orders: ascending or descending.

## Entering Filter Criteria

When you choose to use the Filter By Form, Filter For Input, or Advanced Filter/Sort methods, you enter a *filter criteria*, which is an expression defining the conditions under which the record is to be included when the filter is applied. If the expression evaluates to True, the record is included in the filtered recordset; if not, the record is excluded. The next section discusses expressions and their many uses in Access.

## Creating Expressions

*Expressions* are used for many purposes in Access: to create calculated fields, to impose validation rules, to specify default values, and to provide criteria for filters and queries. Expressions can contain elements such as field name identifiers, functions, literals, constants, and operators.

*Identifiers* are references to fields in expressions and may consist of more than one part, depending on the source of the field. If the field is in the active table, enclose the field name in brackets. If the field is in a related table, include the name of the table: [Alpha Entry]![DR]. The exclamation point (!) operator indicates that what follows—in this case, the field named DR—has been defined by the user. The period (.) operator indicates that what follows was named by Access.

Built-in *functions* can be used in an expression to return a value. Access provides over 160 built-in functions in 16 categories such as Database, Error Handling, Financial, Math, and Messages. All these functions are available in the Expression Builder. You can also use user-defined functions in expressions.

*Literals* are values Access uses exactly as you see them. For example, the string **"Welcome"**, the number **98**, and the date **#01-15-02#** are all literals. *String literals* are enclosed in quotation marks and *date literals* are enclosed in the pound sign (#) date delimiters.

*Constants* are string or numeric literals that don't change. True, False, and Null are examples of constants.

*Operators* are special characters or keywords used to perform calculations or make comparisons. *Arithmetic operators* are used in mathematical expressions; *comparison operators* are used to compare one field value with another, a constant, or a literal; *logical operators* are used to compare two expressions or to negate a single expression.

Arithmetic Operators

The arithmetic operators include the familiar symbols from algebra, plus a few more. Table QR-26 describes the arithmetic operators.

Comparison Operators

The result of an expression using a comparison operator is True, False, or Null. If either of the expressions being compared evaluate to Null, the result of the comparison is Null. Table QR-27 describes the comparison operators used in expressions.

The In and Between...And operators are used in criteria expressions to specify a collection of values or a range of values. For example, the expression

In("CA", "AZ", "NV")

Operator	Result
+	Adds two numbers or numeric expressions.
-	Finds the difference between two numbers or numeric expressions. If only one number or numeric expression, changes the sign.
*	Multiplies two numbers or numeric expressions.
/	Divides two numbers or numeric expressions and returns a floating point result.
\	Divides two numbers or numeric expressions and returns only the integer portion of the quotient.
Mod	Divides two numbers or numeric expressions and returns only the remainder portion of the quotient.
^	Raises a number or numeric expression to an exponential power.

Table QR-26. Arithmetic Operators

Operator	Definition
=	Equal to
<	Less than
<=	Less than or equal to
<>	Not equal to
>	Greater than
>=	Greater than or equal to

**Table QR-27.** *Comparison Operators*

evaluates to True if the value in the corresponding field has any of the three values in the expression. Between...And sets the upper and lower boundaries for values in the field. For example, using the criteria expression

Between 145 And 250

includes all records with a value from 145 to 250 in the corresponding field.

The Like operator is used in criteria expressions to compare a Text or Date/Time field value to a string expression. The Like operator expression can make use of wildcards to perform an inexact search.

## Logical Operators

Logical operators examine the result of two Boolean expressions. Boolean expressions evaluate to True, False, or Null. Logical operators can also be used to perform bitwise comparisons of numeric data. Table QR-28 describes the logical operators.

## Queries

An Access query is a set of explicit instructions that define exactly what information you want and how you want it arranged. Several types of queries are available to retrieve information, perform calculations, display unmatched or duplicate records, update data, delete or append records, or create new tables from existing records. Queries fall into four major categories: select queries, special purpose queries, action queries, and SQL specific queries.

The select queries include the following:

- *Simple Select* queries display data from one or more tables sorted in a specific order.

Operator	Result
And	Performs a logical conjunction on two Boolean expressions. True only if both expressions are True.
Eqv	Performs a logical equivalence on two Boolean expressions. True only if both expressions evaluate to True or both to False. If either expression evaluates to Null, the result is Null.
Imp	Performs a logical implication on two expressions: <ul style="list-style-type: none"> <li>■ Returns False only if Expr1 is True and Expr2 is False.</li> <li>■ Returns Null if both are Null, if Expr1 is True and Expr2 is Null, or if Expr1 is Null and Expr2 is False.</li> <li>■ Otherwise returns True.</li> </ul>
Not	Returns the logical opposite of the expression or Null if the expression evaluates to Null.
Or	Performs a logical disjunction on two expressions. Returns True if either expression evaluates to True. Returns False only when both expressions evaluate to False. Returns Null if both are Null or one is Null and the other is False.
Xor	Performs a logical exclusion on two expressions. If either expression evaluates to Null, the result is Null. Otherwise, evaluates to True if one and only one of the expressions evaluates to True.

**Table QR-28.** *Logical Operators*

- *Find Duplicates* queries display all records in a table that have duplicate values in one or more specified fields.
- *Find Unmatched* queries display records in one table that have no related records in another table.

Special purpose queries include the following:

- *Parameter* queries, when run, display a dialog box where you enter the criteria for retrieving data or a value to insert into a field.
- *AutoLookup* queries automatically fill in certain field values in a new record in one or more tables.
- *Crosstab* queries calculate a sum or count and group the results in a spreadsheet format that correlates the data with two types of information.

Action queries include the following:

- *Update* queries make global changes to a group of records in one or more tables.
- *Append* queries add a group of records from one or more tables to the end of one or more other tables.
- *Delete* queries remove a specific group of records from one or more tables.
- *Make-Table* queries create a new table out of data from one or more tables.

SQL specific queries include the following:

- *Union* queries combine fields from one or more tables into one field in the result.
- *Pass-Through* queries send instructions directly to ODBC databases using commands specific to the server.
- *Data-Definition* queries create or change database objects in Access, a SQL server, or other server database.

## Query Specifications

Certain limits apply to queries such as the number of related tables, the number of criteria, and the size of recordset. Table QR-29 lists the query attributes together with their maximum capacities.

Attribute	Maximum Capacity
Number of tables in a single query	32 tables
Number of enforced relationships	32 per table, minus the number of indexes on the table using fields or combinations of fields not involved in a relationship
Number of fields in the resulting recordset	255 fields
Size of the resulting recordset	1 gigabyte
Character limit for sorting	255 characters in combined sort fields
Number of nesting levels for queries	50 levels

**Table QR-29.** *Query Specifications*

Attribute	Maximum Capacity
Number of characters in a single cell in the query design grid	1,024 characters
Number of characters requested by a parameter query	255 characters
Number of ANDs in a SQL WHERE or HAVING clause	99 ANDs
Number of characters in a SQL statement	Approximately 64,000 characters

**Table QR-29.** *Query Specifications* (continued)

## Query Properties

Several properties are common to all types of queries, except the SQL-Specific queries:

- *Description*, which contains a more informative description of the query and its purpose.
- *Link Child Fields*, which specifies the field name(s) in the subordinate object.
- *Link Master Fields*, which specifies the field name(s) in the main object.
- *ODBC Timeout*, which specifies the number of seconds to wait before a time-out error occurs.
- *Orientation*, which enables right-to-left features if using a language version of Office.
- *Record Locks*, which specifies how records are locked when the query runs. No Locks (default), All Records, or Edited Records.
- *Run Permissions*, which specifies which permission is required; overrides existing user permissions. **User's** (default)/Owner's.
- *Source Connect Str*, which names the application used to create an external database.
- *Source Database*, which names the external host database.
- *Subdatasheet Expanded*, which displays the subdatasheet expanded with the main datasheet. Yes/**No**.
- *Subdatasheet Height*, which specifies the maximum height of the expanded subdatasheet: **2"**.
- *Subdatasheet Name*, which specifies the associated subdatasheet.

Table QR-30 describes the remaining query properties, together with the type of query each property applies to and the settings they can assume.

Property	Description*	Query Types
Column Headings	Specifies the order or limits the number of columns. Data values in quotation marks, separated by commas.	Crosstab
Default View	Specifies the default view for the query result. <b>Datasheet</b> , PivotTable, PivotChart.	Select, Crosstab, Union, Parameter
Dest Connect Str	Specifies the name of the database to contain the new table or has the table that is to receive the appended records.	Append, Make-table
Destination DB	Specifies the type of application used to create an external database. <b>Current</b> is default.	Append, Make-table
Destination Table	Name of table to hold query results.	Append, Make-table
Fail On Error	Specifies whether to terminate if an error occurs when running a query against an ODBC data source. Yes/ <b>No</b>	Update, Delete
Filter	Specifies a filter expression saved with the query.	Select, Parameter, Union
Log Messages	Specifies whether to store messages returned from an ODBC database. Yes/ <b>No</b>	SQL Pass-through
<b>Table QR-30.</b> <i>Query Properties</i>		

Property	Description*	Query Types
Max Records	Sets limit on the number of records returned from an ODBC database.	Select, Union, Parameter, SQL Pass-through
ODBC Connect Str	Defines a connection to a SQL database.	SQL Pass-through
Order By	Specifies a sort order saved with the query.	Select, Parameter, Union
Output All Fields	Includes all fields. <b>Yes/No</b>	Select, Parameter, Append, Make-table
Recordset Type	Specifies the type of recordset made available to a form. <b>Dynaset</b> , Dynaset (Inconsistent), Snapshot	Select, Parameter, Crosstab
Returns Records	Specifies whether to return records from a SQL database. <b>Yes/No</b>	SQL Pass-through
Top Values	Specifies number or percentage of records containing top values in specific field.	Select, Parameter, Make-table, Append
Unique Records	Returns unique records based on all the fields in the underlying data source, not only those in the query. <b>Yes/No</b>	Select, Parameter, Update, Append, Delete, Make-table
Unique Values	Omits records with duplicate field values. Values in all fields in query result must be unique. <b>Yes/No</b>	Select, Parameter, Append, Make-table
Use Transaction	Runs query as a single transaction. <b>Yes/No</b>	Update, Append, Delete, Make-table

\* Default values are indicated in boldface.

**Table QR-30.** Query Properties (continued)

## Aggregate Functions

When you want to perform calculations with a query, you can add the Total row to the query design grid by choosing View | Totals, by clicking the Totals toolbar button, or by right-clicking in the grid and choosing Totals from the shortcut menu. The Totals drop-down list includes 12 options, 7 of which are aggregate functions that perform calculations on the field specified in the Field row.

When used in a query, the aggregate functions don't include records with blank (Null) values in the calculations. Table QR-31 describes the aggregate functions and the data types with which they can be used.

Five other options are in the Total drop-down list as follows:

- The *Group By* option defines the field group you want to summarize with an aggregate function.
- The *Expression* option enables you to enter an expression that creates a calculated field, which includes an aggregate function.

Function	Result	Applies to Data Types
Sum	Adds the values in the field.	Number, Date/Time, Currency, and AutoNumber
Avg	Computes the average of the values in the field.	Number, Date/Time, Currency, and AutoNumber
Min	Finds the lowest value in the field.	Text, Number, Date/Time, Currency, and AutoNumber
Max	Finds the highest value in the field.	Text, Number, Date/Time, Currency, and AutoNumber
Count	Counts the number of non-Null values in the field.	Text, Memo, Number, Date/Time, Currency, AutoNumber, Yes/No, and OLE Object
StDev	Computes the standard deviation of the values in the field.	Number, Date/Time, Currency, and AutoNumber
Var	Computes the variance of the values in the field.	Number, Date/Time, Currency, and AutoNumber

**Table QR-31.** Aggregate Functions Used in Queries

- The *Where* option specifies the criteria for a field that isn't used in a grouping.
- The *First* option returns a field value from the first record in the result set.
- The *Last* option returns a field value from the last record in the result set.

## Producing Reports

As you work on a report design, you can switch to Preview view to see how it looks. You can also preview the report with just enough data to check all sections by using Layout Preview. You can view more than one page in Layout Preview, just as you can in Print Preview. If the report is based on a parameter query, you needn't enter any parameter values to open Layout Preview.

Once the report is satisfactory, you need to set up the page margins and other options.

### Page Setup and Options

With the report open in any view or simply selected in the Database window, choose File | Page Setup to open the Page Setup dialog box (see Figure QR-6). The dialog box has three tabs:

- *Margins*, where you can set the four page margins and specify to print data only.
- *Page*, where you set the orientation and paper size and specify the printer to use.
- *Columns*, where you set the number, size, and layout of columns.

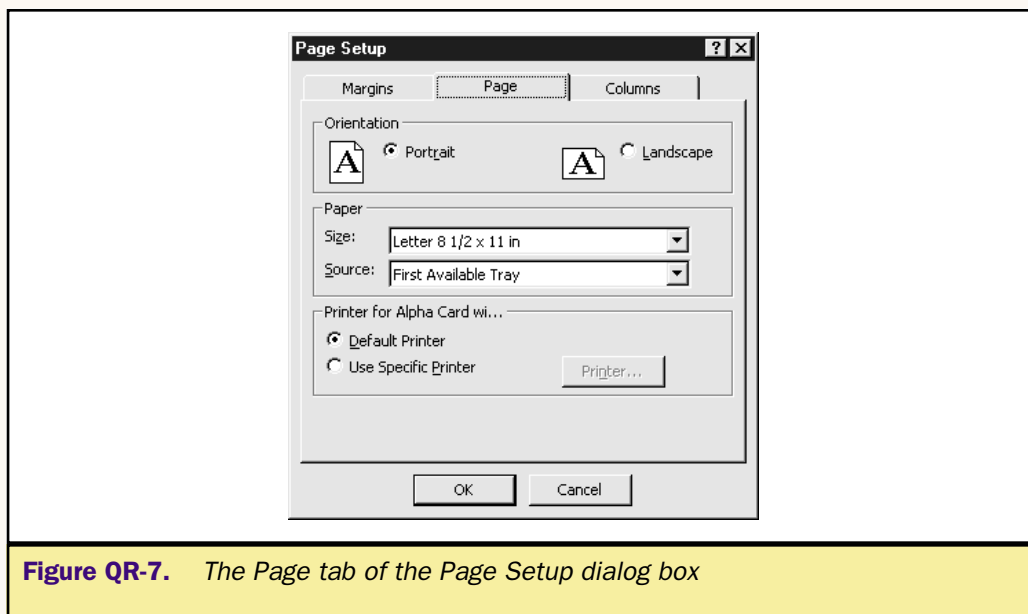
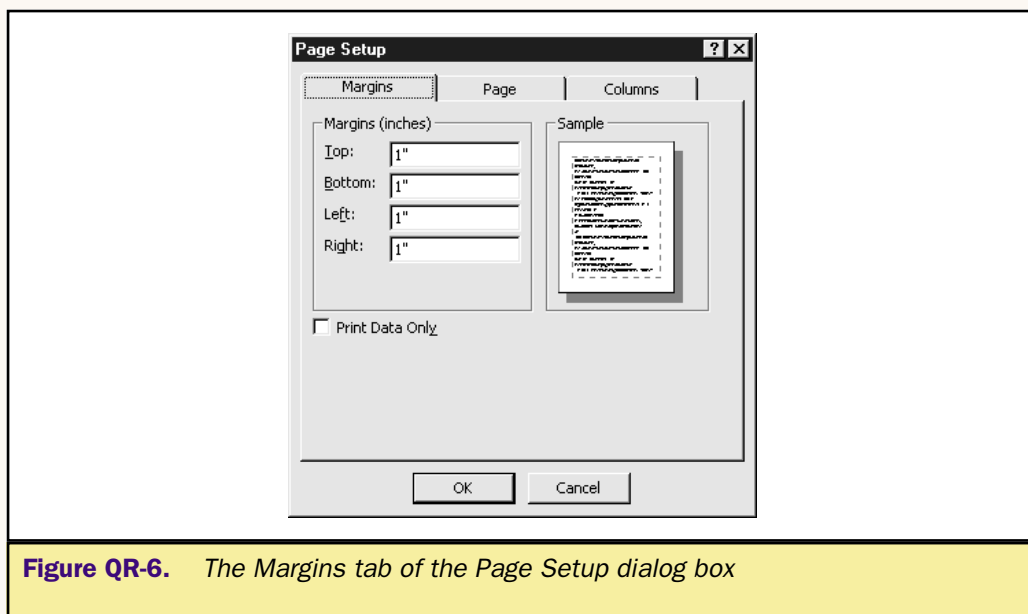
The margin settings are measured in inches or in the unit of measure specified in the Windows Regional Settings Properties dialog box.

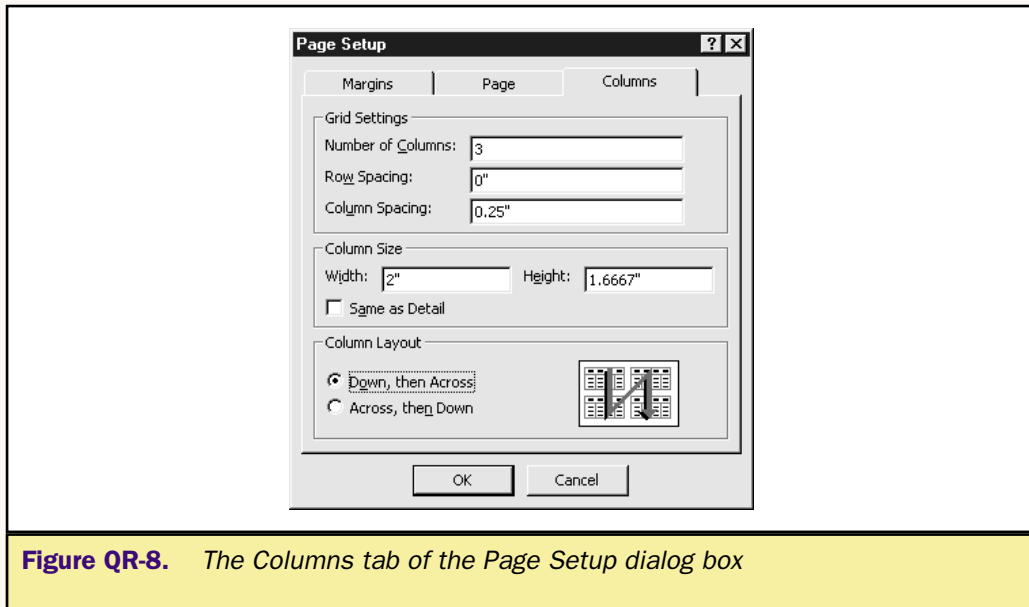
Click the Page tab to specify the page options (see Figure QR-7). The Paper Size drop-down list has a choice of 11 different page sizes. Your printer may determine which sizes you can use to print the report. Also, depending on your printer, you have a choice of paper trays, some automatic and others manual. If you have more than one printer in the system, one is designated as the Default Printer in the Control Panel Settings. If you want to choose another, click Use Printer and click the Printer button to display a list of available printers.

If you're printing a report that contains multiple columns, you can set options in the Columns tab (see Figure QR-8). The Grid Settings group specifies the number of columns across the page and the space to leave between the rows and the columns.

The Column Size group controls the size of the columns, again in inches or the unit of measure set in the Windows Regional Settings Properties.

- Type the width of the column in the Width box.
- Type the height of the row in the Height box.
- Choose Same As Detail if you want the values in the Width and Height boxes to match the width and height of the Detail section of the report.





**Figure QR-8.** The Columns tab of the Page Setup dialog box

The final option is the Column Layout, which determines the order in which the data is placed in the columns. The options are

- *Down, then Across*, which fills one column vertically, and then starts filling the next column to the right.
- *Across, then Down*, which places data in one row across the page, and then starts filling the next row below.

## Controlling the Print Process

Keeping data in a single record or in a group together on the same page may be important at times. At other times, you might want to start a new page for each record, group, or section. All of these can be accomplished by setting section properties for specific sections as follows:

**Keeping Data Together** Several report section properties can be combined to ensure that data is printed together in the same page or column.

- To keep record data together on a page or in a column, set the Detail section Keep Together property to Yes. If the record data won't fit on the page, the property setting is ignored.
- To print a group header, all the detail records, and the group footer together on one page, set the Keep Together property in the Sorting and Grouping dialog box to Whole Group.

- To make sure the group header is printed on a page or in a column only if the first detail record will also fit, set the Keep Together property in the Sorting and Grouping dialog box to With First Detail.
- To print the entire group together on one page, set the Grp Keep Together report property to Per Page.
- To print the entire group together in a column or row, set the Grp Keep Together report property to Per Column/Row.

**Starting on a New Page** If you want to start each record, group, or section on a new page, use the section's Force New Page property. This property is available to all sections, except page headers and footers. If you want to print every record on a separate page, set the Force New Page property for the detail section. The property has the following settings:

- Set to None, the default, the section prints on the current page.
- Set to Before Section, the section begins printing at the top of a new page.
- Set to After Section, the following section begins printing at the top of a new page.
- Set to Before & After, the current section prints at the top of a new page and the following section also prints at the top of a new page.

If you want to force a page break only under specific conditions, you can add a page break to the report, and then use a macro to decide whether to activate it by setting the control's Visible property.

You actually need two macros: one attached to the On Format event of the report page header section that sets the page break Visible property to No, and a second attached to the On Format property of the section that contains the conditional page break. Add a condition to the second macro under which the page break Visible property is changed to Yes.

**Cancel Blank Reports** If you have a report based on a query and the query produces no records, you don't want to waste time setting up a blank report. To avoid this, set the report On No Data event property to the name of a macro or event procedure that cancels previewing or printing the report.

If you use a macro, you can display a message with the MsgBox action that explains no records are in the report and the report has been canceled. Then add the Cancel Event action to stop previewing or printing the report.

If you use an event procedure, use the MsgBox statement to display the explanatory message, and then set the Cancel argument of the Report\_NoData Sub procedure to True.

**Hiding a Section** You can prevent any section from printing or appearing in preview by setting the section's Visible property to No. If you want to hide the section only under specific conditions, attach a macro or event procedure to the section's On Format event property.

## Information Exchange

One of the strengths of Access is the nearly seamless exchange of data and other objects with other databases and with applications of a different nature. This section describes the easily imported and exported file types, the tools Access 2002 provides, and the specifications you can set in Access to govern the import and export process.

### Text and Graphics Converters and Filters

Some of the tools you need to exchange text, graphics, and other objects with other programs are included in the Office 2000 Typical installation; others are installed the first time you call on them. All the tools are found in the Converters and Filters list in the Office Setup feature tree. Table QR-32 lists the available graphics filters.

Table QR-33 lists the text formats from the Microsoft Office Converters and Filters features that can be installed with Access 2002.

Graphics Filter	File Format
Computer Graphics Metafile	.cgm
CorelDRAW	.cdr
Encapsulated PostScript	.eps
Enhanced Metafile	.wmf
FlashPix	.fpx
Graphics Interchange Format	.gif
Joint Photographic Experts	.jpeg
Kodak Photo CD	.pcd
Macintosh PICT	.pct
PC Paintbrush	.pcx
Portable Network Graphics	.png
Tag Image File Format	.tif
Windows Bitmap	.bmp
Windows Metafile	.emf
WordPerfect Graphics Filters	.wpg

**Table QR-32.** *Graphics Filters Installed with Access 2002*

**Text Filter**

Lotus 1-2-3 Converter  
Microsoft Excel Converter  
Recover Text Converter  
Text with Layout Converter  
Word 6.0/95 Export Converter  
Word 6.0/95 for Windows/Macintosh  
Word 97 for Windows/Word 98 Macintosh  
Word 97-2000 & 6.0/95 RTF Converter  
Word for Macintosh 4.0-5.1 Converter  
Word for Windows 2.0 Converter  
WordPerfect 5.x Converter  
WordPerfect 6.x Converter  
Works for Windows 4.0  
Works for Windows 5.0

**Table QR-33.** *Text Converters Available to Access 2002*

## Compatible File Formats

In addition to being able to exchange Access objects with other Access databases, you can exchange Access with other programs. Access can import or link to objects in other formats, as well as save or export Access objects to many of the same formats listed. Table QR-34 lists the database and other types of file formats compatible with Access 2002.

## Import and Export Options and Specifications

When you import objects from another Access database, you have several options that control the import process. In the Import Objects dialog box, click Options to expand the dialog box and select from the following options:

- In the Import group, include Relationships, Menus and Toolbars, and Import/Export Specs.
- In the Import Tables group, choose Definition and Data, or Definition Only.

Application	Format	Comments
dBASE	III, III+, IV, 5.0, and 7.0.	Linking (read/write) with 7.0 requires Borland Database Engine 4.x or later.
Delimited text files	Windows (ANSII) and DOS.	All character sets.
Excel	3.0, 4.0, 5.0, 7.0/95, 8.0/97, and 9.0/2000.	Import, link, and export to all versions.
Fixed-width text files	Windows (ANSII) and DOS.	All character sets.
HTML	1.0, 2.0, and 3.x.	Format 1.0 if a list, 2.0, and 3.x.
Lotus 1-2-3	.wks, .wk1, .wk3, and .wk4.	Import and link to all (link is read-only), but export only to .wk1 and .wk3 formats.
Paradox	3.x, 4.x, 5.0, and 8.0.	Linking (read/write) with 8.0 requires Borland Database Engine 4.x or later.
Programs and databases that support ODBC protocol	SQL tables and other formats.	See Microsoft Knowledge Base article #Q140548 for a list of ODBC drivers.
Visual FoxPro	2.x, 3.0, 5.0, 6.x.	Version 3.0 import and export, but not link. Version 6.x is import only.
XML		All versions.

**Table QR-34.** *Formats Compatible with Access 2002*

- In the Import Queries group, you have the choice of importing the queries As Queries or As Tables.

When you export to an external Access database, you have the choice of exporting only the table definitions or both the definitions and the data.

When working with text files, you can set import and export specifications to specify the formatting of the text. To set the specifications for a text file you're importing, click Advanced in any of the Import Wizard dialog boxes. Similarly, to set the export specification, click Advanced in any of the Export Wizard dialog boxes. Table QR-35 lists the specifications you can set in the dialog box.

Option	Description	Settings
File Format	Specifies the file as containing values all the same length or separated by a delimiter.	Fixed Width or Delimited.
Field Delimiter	Character used to separate the values, if delimited.	Usually a comma but you can choose semicolon (;), {tab}, or {space} from the drop-down list.
Text Qualifier	Character that encloses the text characters.	Choices are double or single quotation marks or {none}.
Language	Specifies language range.	English (default) or All.
Code Page	Specifies the type of page used for storing text characters.	OEM United States (default), Unicode, Unicode (Big-Endian), Unicode (UTF-7), Unicode (UTF-8), Western European (DOS), Western European (ISO), Western European (Windows).
Date Order	Specifies the order of date numbers in a date value.	MDY (default), DYM, DMY, MYD, YDM, YMD.
Date Delimiter	Character that separates parts of date value.	Default is / but can be any character.
Time Delimiter	Separates hours, minutes, and seconds in time value.	Default is colon (:) but can be any character.
Four Digit Years	Imports or exports year data with four digits.	Check for Yes, clear for No.

**Table QR-35.** *Text Import and Export Specifications*

Option	Description	Settings
Leading Zeros in Dates	Imports or exports single-digit date values with leading zeros.	Check for Yes, clear for No.
Decimal Symbol	Enter character to be used as decimal point in numbers and currency values.	Default is period (.).
Field Information	Lists each field in the file with the field name, data type, whether indexed or not, and a check box for skipping the field in the import or export process.	Make changes as necessary and check Skip to eliminate a field from the resulting file.

**Table QR-35.** *Text Import and Export Specifications (continued)*

**Tip**

Many of the import and export specifications are set in the Windows Regional Settings Properties dialog box, but can be overridden in the Import or Export Specifications dialog box on a case-by-case basis.

## Changing the Access Environment

Microsoft understands no two work environments are exactly alike, so Access provides methods of changing many aspects of the appearance and behavior of the environment. You may be satisfied with Access just the way it installs or you can change a large number of options in several categories. You can also run Setup to install other components not included in the Typical installation.

## Access Wizards, Builders, and Add-Ins

With Access 2002 supplying so many helpful wizards, builders, and add-ins, little reason exists to start a new database, form, report, page, or query from scratch. Table QR-36 describes the many built-in wizards and how to launch them. Many of them are automatically installed during Typical Installation; others, which install by default on first use, are available in the Additional Wizards group. The wizards marked with a single asterisk in the table are part of the Additional Wizards component.

Wizard	Purpose	Start By
AutoDialer	Adds a control to a form or datasheet, or a button to a toolbar that dials a selected phone number.	Choose View   Toolbars   Customize and drag the AutoDialer command from the Records category of commands.
AutoForm	Creates a basic data entry form based on the selected table or query.	Choose from the New Form dialog box or choose Insert   AutoForm. Also click the New Object button and choose AutoForm.
AutoFormat	Applies predefined styles to existing forms or reports. Also creates custom styles.	Choose Format   AutoFormat or click the AutoFormat toolbar button.
AutoPage	Creates a data access page automatically.	Choose AutoPage—Columnar from the New Data Access Page dialog box.
AutoReport	Creates a basic report containing all the fields in the selected table or query.	Choose from the New Report dialog box or choose Insert   AutoReport. Also click the New Object button and choose AutoReport.
Controls	Helps create controls in a form or report Design view, including combo box, command button, list box, option group, subform, or subreport controls. Also helps create combo box, command button, and list box controls for data access pages. Option Group and Subform/Subreport Wizards are in the Additional Wizards group.	Click the Control Wizards button, and then click the desired control button on the toolbox.

**Table QR-36.** *The Access Wizards*

Wizard	Purpose	Start By
Controls (Page)	Helps create controls on a data access page, including combo box, command button, and list box.	Click the Control Wizard's button, and then click the desired control button on the toolbox.
Crosstab Query	Creates a query that summarizes data in a compact, spreadsheet-like format.	Choose from the New Query dialog box.
Database	Creates a new database for a variety of uses based on ten prebuilt models.	Choose File   New and double-click a database model in the Task Pane.
Database Splitter*	Splits databases into a front-end/back-end application for a multiuser environment.	Choose Tools   Database Utilities   Database Splitter.
Documenter*	Displays, prints, or saves the design characteristics of any or all types of objects in the database.	Choose Tools   Analyze   Documenter, and then choose the object types you want to include in the dialog box.
Export	Exports data to a text file, enabling you to specify field delimiters, data types, and other details of the data.	Runs automatically when you choose File   Export, and then, in the Save As dialog box, select Text Files from the Save as type drop-down list and click Save All.
Find Duplicates Query*	Creates a query that finds records with duplicate field values in a single table or query.	Choose from the New Query dialog box.
Find Unmatched Query*	Creates a query that finds records in one table that have no related records in another table.	Choose from the New Query dialog box.

**Table QR-36.** *The Access Wizards (continued)*

Wizard	Purpose	Start By
Form	Creates a new form.	Choose from the New Form dialog box or double-click the Create form by using the wizard shortcut.
Graph (Chart)*	Adds a chart to a form or report based on the data in a table or query.	Select in the New Form or New Report dialog box or choose Insert   Chart while in a form or report Design view.
Import	Imports from another database, a spreadsheet, an Exchange or Outlook folder, a text file, an HTML document, an XML Document, or an ODBC database into an Access table.	Choose File   Get External Data   Import and choose from the Files of Type list.
Input Mask*	Creates a custom input mask for a field.	Click Build in the Input Mask property box in table Design view.
Label	Creates mailing labels in many standard sizes and arrangements. Also allows customizing a label layout.	Choose from the New Report dialog box.
Link	Links from another database, a spreadsheet, an Exchange or Outlook folder, a text file, an HTML document, or an ODBC database into an Access table.	Choose File   Get External Data   Link Tables, and then choose from the Files of Type list.
Lookup	Creates a lookup column in a table that displays a list of values from which the user can choose.	In table Design view, choose Lookup Wizard from the list of data types. In table Datasheet view, choose Insert   Lookup Column.

**Table QR-36.** *The Access Wizards (continued)*

Wizard	Purpose	Start By
Macro to Module Converter*	Converts a macro to Visual Basic code.	Select the macro in the Database window, choose File   Save As, and then choose Module in the Save As dialog box and click OK. Also choose Tools   Macro   Convert Macros to Visual Basic.
Microsoft Word Mail Merge	Helps to merge table data from Access with a document stored in Word.	Choose Tools   Office Links   Merge It With MS Word or click Office Links toolbar button and choose Merge It With MS Word.
Page	Creates a new data access page.	Choose from the New Page dialog box or double-click the Create Data Access Page By Using Wizard shortcut.
Partial Replica*	Creates a partial database replica from the active replica or Design Master.	Choose Tools   Replication   Partial Replica Wizard.
Performance Analyzer*	Analyzes any or all aspects of a database for performance efficiency and produces a list of suggestions for improving its performance.	Choose Tools   Analyze   Performance.
PivotTable	Creates an Excel PivotTable on an Access form for summarizing large quantities of data.	Choose from the New Form dialog box.
Print Relationships	Prints the diagram displayed in the Relationships window.	Choose File   Print Relationships.
Report	Creates a report based on one or more tables or queries.	Choose from the New Report dialog box or double-click Create Report By Using Wizard shortcut.

**Table QR-36.** The Access Wizards (continued)

Wizard	Purpose	Start By
Security*	Creates a new workgroup information file for current database, and assigns permissions and passwords.	Choose Tools   Security   User-Level Security Wizard.
Simple Query	Creates a select query from the fields you pick from one or more tables.	Choose from the New Query dialog box or double-click the Create Query By Using Wizard shortcut.
Subform/Subreport Field Linker*	Links fields in a main form and a subform, or in a main report and a subreport.	Automatically called if you used the Subform/Subreport Wizard. If not, start manually in the main form Design view by selecting the subform control and clicking Build in the subform's Link Child Fields or Link Master Fields property box.
Table	Creates a new table.	Choose from the New Table dialog box or double-click the Create Table By Using Wizard shortcut.
Table Analyzer*	Helps create an efficient database—examines a table and suggests reducing duplicate data by splitting the table into related tables.	Select the table name in the Database window and choose Tools   Analyze   Table.
Upsizing	Migrates database objects from an Access database to a new or existing SQL Server database and creates a report with a detailed description of the process.	Choose Tools   Database Utilities   Upsizing Wizard.
* Part of the Additional Wizards component.		
<b>Table QR-36.</b> <i>The Access Wizards (continued)</i>		

In addition to the fleet of wizards, Access 2002 offers the help of several builders that can make other jobs easier. The built-in builders include the following:

- *Color Builder*, which displays a palette of ready-mixed colors, as well as provides the tools to create custom colors.
- *Expression Builder*, which gives you the elements for creating expressions for macros, queries, and property sheets.
- *Field Builder*, which creates new fields for a table from a list of predefined samples.
- *ODBC Connection String Builder*, which creates the correct syntax for connection to an ODBC database.
- *Picture Builder*, which creates bitmap images for insertion in forms and reports.
- *Query Builder*, which makes sure the syntax in the query is correct.

The Color, Expression, and Query Builders are always installed. The Field and Picture Builders are installed with the Typical Installation, and the ODBC Connection String Builder is one of the Additional Wizards.

Three manager add-ins are used in the background while you are running Access. The Add-In Manager is available from the Tools | Add-Ins menu. The other two are available from the Tools | Database Utilities menu.

- *Add-In Manager*, which you can use to install and uninstall wizards, builders, and add-ins. You can also use the Add-In Manager to create your own wizards.
- *Linked Table Manager*, which keeps track of the linkages to tables between databases.
- *Switchboard Manager*, which creates and manages switchboard forms for customized applications.

The Switchboard Manager is installed with the Typical Wizards, but the Add-In Manager and the Linked Table Manager are members of the Additional Wizards group and are installed on first use.

## Setting Default Options

When you choose Tools | Options, a dialog box opens displaying eight tabs, which contain groups of related default options. You can use these dialog boxes to change the default settings for all Access databases in the current workgroup information file. These default settings can be overridden for any specific database or project. Table QR-37 describes the contents of each of the Options dialog box tabs.

Options Tab	Option Category	Options
Datasheet	Default colors	Font, Background, Gridlines
	Default font	Font, Weight, Size, Underline, Italic
	Default gridlines showing	Horizontal, Vertical, Default column width in inches
	Default cell effect	Flat, Raised, Sunken
	Show animations	Check box
Tables/Queries-Table Design	Default field sizes	Text, Number
	Default field type	Drop-down list of data types
	AutoIndex on Import/Create	List of characters on which to create indexes automatically
Tables/Queries-Query Design	Query Design	Show table names, Output all fields, Enable AutoJoin
	Run Permissions	Owner's, User's
	SQL Server Compatible Syntax (ANSI92)	This database, Default for new databases
Forms/Reports	Selection behavior	Partially enclosed, Fully enclosed
	Form template	Name of template
	Report template	Name of template
	Always use event procedures	Check box
Advanced	DDE operations	Ignore DDE requests, Enable DDE refresh
	Command line arguments	Value you want the command function to return
	Other options	OLE/DDE timeout (sec), Refresh interval (sec), Number of update retries, ODBC refresh interval (sec), Update retry interval (msec)

**Table QR-37** *Setting Default Options*

Options Tab	Option Category	Options
<b>Advanced</b>	Default open mode	Shared, Exclusive
	Default File Format	Version of Access
	Default record locking	No locks, All records, Edited record
	Open databases using record-level locking	Check box
<b>View</b>	Show	Status bar, Startup Task Pane, New object shortcuts, Hidden objects, System objects, Windows in Taskbar
	Show in macro design	Names column, Conditions column
	Click options in Database window	Single-click open, Double-click open
<b>General</b>	Print margins	Left margin, Right margin, Top margin, Bottom margin (set margin sizes)
	Recently used file list	Number of files to display at the bottom of the File menu or in the task pane
	Provide feedback with sound	Check box
	Compact on close	Compacts and repairs database if it would reduce by 256K or more
	Remove personal info from this file	Check box
	Default database folder	Name of path
	New database sort order	Drop-down list of available languages
	Web Options	Hyperlink color, Followed hyperlink color, Underline hyperlinks

**Table QR-37** *Setting Default Options (continued)*

Options Tab	Option Category	Options
General	Use four-digit year formatting	This database, All databases
	Name AutoCorrect	Track name AutoCorrect info, Perform name AutoCorrect, Log name AutoCorrect changes
	New database sort order	General or choose a specific language
Edit/Find	Default find/replace behavior	Fast search, General search, Start of field search
	Show list of values in (current database only)	Local indexed fields, Local nonindexed fields, ODBC fields
	Confirm	Record changes, Document deletions, Action queries
	Don't display lists where more than this number of records read:	Enter maximum number of records
Keyboard	Move after enter	Don't move, Next field, Next record
	Arrow key behavior	Next field, Next character
	Cursor stops at first/last field	Check box
	Datasheet IME Control	Check box
	Behavior entering field	Select entire field, Go to start of field, Go to end of field
Pages	Default Designer Properties	Section Indent (in.), Alternate Row Color, Caption Section Style, Footer Section Style

**Table QR-37** *Setting Default Options (continued)*

Options Tab	Option Category	Options
Pages	Default	Use Default Page Folder (choose folder)
	Database/Project Properties	Use Default Connection File (choose file)
International	Default Direction	Left-to-right, Right-to-left
	General Alignment	Interface mode, Text mode
	Use Hijri Calendar	Check box
	Cursor Movement	Logical, Visual
Spelling	Dictionary Language	Choose from list
	Add words to	Name of dictionary
	Suggest from main dictionary only	Check box
	Ignore words in UPPERCASE	Check box
	Ignore words with numbers	Check box
	Ignore Internet and file addresses	Check box
	AutoCorrect options	Correct TWo INitial CAPITALs, Capitalize first letter of sentences, Capitalize names of days, Correct accidental use of cAPS LOCK key, Replace text as you type
	Language-specific	German: Use post-reform rules, Korean: Combine aux verb/adj., Korean: Use auto-change list, Korean: Process compound nouns
	Hebrew modes:	Full
	Arabic modes:	Both strict

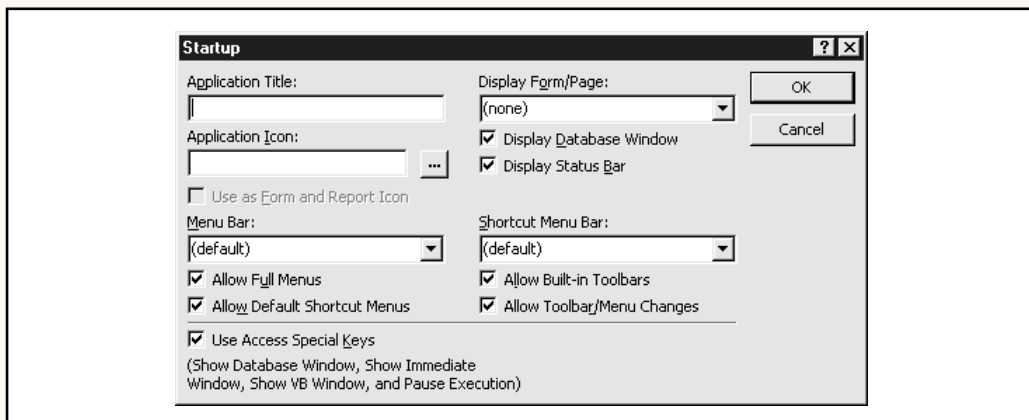
**Table QR-37**   *Setting Default Options (continued)*

## Changing Startup Options

To change the way Access starts, choose Tools | Startup to open the Startup dialog box (see Figure QR-9).

The Startup options include the following:

- *Application Title* displays a custom title in the title bar.
- *Application Icon* adds a custom icon to the title bar.
- *Menu Bar* specifies a custom global menu bar.
- *Allow Full Menus* displays or hides menus that can be used to make changes in objects.
- *Allow Default Shortcut Menus* permits or prevents user access to built-in shortcut menus.
- *Display Form/Page* specifies a form, such as a welcome screen or a switchboard to show at startup.
- *Display Database Window* displays or hides the Database window.
- *Display Status Bar* displays or hides the status bar.
- *Shortcut Menu Bar* specifies a custom shortcut menu to replace the built-in shortcut menu.
- *Allow Built-in Toolbars* permits or prevents user access to built-in toolbars.
- *Allow Toolbar/Menu Changes* permits or prevents user modification of built-in or custom toolbars and menus.



**Figure QR-9.** The Startup dialog box

- *Use Access Special Keys* permits or denies the use of special key combinations that show the Database window (F11), show the Visual Basic Immediate window (CTRL-G), show the Visual Basic Editor window (ALT-F11), and stop retrieving records from the server (CTRL-BREAK).

## Programming with Macros and SQL

Three programming structures are used in Access applications: macros, SQL statements, and Visual Basic code. This section of the Quick Reference lists the specifications imposed on Access macros and describes the macro actions individually. SQL syntax is also discussed with descriptions of using SQL to construct Access queries.

### Macro Specifications

The following specifications apply to macros created in Access 2002:

- Up to 999 actions in a single macro
- Up to 255 characters in a condition
- Up to 255 characters in a comment
- Up to 255 characters in an action argument

### Macro Actions

Table QR-38 contains an alphabetical list of macro actions with a description of the action and any required and optional arguments. Required arguments appear in bold. All macro actions can be run conditionally by entering a condition expression in the Conditions column of the macro action row.

Macro Action	Description	Arguments*
AddMenu	Creates a custom menu bar for a form or report; a custom shortcut menu for a form, form control, or report; a global menu bar or global shortcut menu to replace the built-ins.	Menu Name (ignored for shortcut menus, but required for custom and global menu bars), <b>Menu Macro Name</b> , Status Bar Text (ignored for shortcut menus)

**Table QR-38.** *Macro Actions*

Macro Action	Description	Arguments*
ApplyFilter	Applies a filter, a query, or a SQL WHERE clause to a table, form, or report to restrict or sort the records in the table, or the records from the underlying table or query of the form or report.	Filter Name (must be blank when applying Server filter), Where Condition (Must use one or both), Filter Type (default Normal)
Beep	Sounds a beep.	None
CancelEvent	Cancels the event that caused Access to run the macro containing this action.	None
Close	Closes a specified window or the active window if none is specified.	Object Type, Object Name, Save (default Prompt)
CopyDatabaseFile	Copies the current database.	Database File Name, Overwrite Existing File (default), Disconnect All Users (default No)
CopyObject	Copies the specified database object to a different database or to the same database or project under a new name.	Destination Database, New Name, Source Object Type, Source Object Name
DeleteObject	Deletes a specified database object.	Object type, Object Name
Echo	Turns echo on or off while the macro runs.	Echo On (default Yes), Status Bar Text
FindNext	Locates the next record that meets the criteria set by the previous FindRecord action or set in the Find In field dialog box.	None

**Table QR-38.** *Macro Actions (continued)*

Macro Action	Description	Arguments*
FindRecord	Finds the first instance of data that meets the criteria specified by the FindRecord arguments.	<b>Find What</b> , Match (default Whole Field), Match Case (default No), Search (default All), Search As Formatted (default No), Only Current Field (default Yes), Find First (default Yes)
GoToControl	Moves focus to a specified field or control in the current record in an open form or datasheet.	<b>Control Name</b>
GoToPage	Moves focus in a form to the first control on the specified page.	Page Number (if blank, focus stays on current page), Right (horizontal position), Down (vertical position). Right and Down are used together
GoToRecord	Makes specified record the current record in an open table, form, or query result set.	Object Type (Table, Query, Form, Server View, Stored Procedure, or Function), Object Name, Record (default Next), Offset
Hourglass	Changes the mouse pointer to an image of an hourglass while a macro is running.	Hourglass On (default Yes)
Maximize	Enlarges the active window, so it fills the Access window.	None
Minimize	Reduces the active window to a small title bar at the bottom of the Access window.	None
MoveSize	Moves or resizes the active window	Right, Down, Width, Height (must enter at least one argument)

**Table QR-38.** Macro Actions (continued)

Macro Action	Description	Arguments*
MsgBox	Displays a message box containing a warning or other information.	<b>Message</b> (up to 255 characters), <b>Beep</b> (default Yes), <b>Type</b> (default None), <b>Title</b> ( "Microsoft Access")
OpenData-AccessPage	Opens a data access page in Page view or Design view.	<b>Data Access Page Name</b> , <b>View</b> (default Browse)
OpenDiagram	Opens a database diagram in Design view.	<b>Diagram Name</b>
OpenForm	Opens a form in Form view, form Design view, Print Preview, or Datasheet view.	<b>Form Name</b> , <b>View</b> (default Form), <b>Filter Name</b> , <b>Where Condition</b> , <b>Data Mode</b> , <b>Window Mode</b> (default Normal)
OpenFunction	Opens a function in	<b>Function name</b> (required), <b>View</b> (default Datasheet), <b>Data Mode</b> (default Edit)
OpenModule	Opens a specified Visual Basic module at a specified procedure.	<b>Module Name</b> , <b>Procedure Name</b> (must enter valid name in either argument)
OpenQuery	Opens a select or Crosstab query in Datasheet view, Design view, or Print Preview.	<b>Query Name</b> , <b>View</b> (default Datasheet), <b>Data Mode</b> (default Edit)
OpenReport	Opens a report in Design view or Print Preview, or prints the report immediately.	<b>Report Name</b> , <b>View</b> (default Print), <b>Filter Name</b> , <b>Where Condition</b> , <b>Window Mode</b> (default Normal)
OpenStored-Procedure	Opens a stored procedure in Datasheet, Design, or Print Preview, PivotTable, PivotChart view.	<b>Procedure Name</b> , <b>View</b> (default Datasheet), <b>Data Mode</b> (default Edit)

**Table QR-38.** *Macro Actions (continued)*

Macro Action	Description	Arguments*
OpenTable	Opens a table in Datasheet, Design, Print Preview, PivotTable, or PivotChart view.	<b>Table Name</b> , View (default Datasheet), Data Mode (default Edit)
OpenView	Opens a view in Datasheet, Design, Print Preview, PivotTable, or PivotChart view.	<b>View Name</b> , View (default Datasheet), Data Mode (default Edit)
OutputTo	Outputs the data in the specified table, query, form, report, data access page, or module to a file in Excel (*.xls), MS-DOS text (*.txt), rich-text (*.rtf), HTML (*.htm), IIS (*.htx or *.idc), Snapshot (*.snp), Active Server (*.asp) format, or stored procedure.	<b>Object Type</b> (default Table), Object Name, Output Format, Output File, AutoStart (default No), Template File, Encoding
PrintOut	Prints the active object in the open database.	Print Range (default All), Page From, Page To, Print Quality (default High), Copies (default 1), Collate Copies (default Yes)
Quit	Exits Access.	Options (default Save All)
Rename	Renames a specified database object.	<b>New Name</b> , Object Type, Old Name
RepaintObject	Completes any pending screen updates for the active database object or a specified database object.	Object Type (leave blank for active object), Object Name (leave blank if Object Type is blank)
Requery	Updates the data in a specified control on the active object by requerying the control source.	Control Name
Restore	Restores a maximized or minimized window to its previous size.	None

**Table QR-38.** Macro Actions (continued)

Macro Action	Description	Arguments*
RunApp	Runs another application, such as Excel, Word, or PowerPoint, from within Access.	<b>Command Line</b>
RunCode	Calls a Visual Basic Function procedure.	<b>Function Name</b>
RunCommand	Runs a built-in command, such as one that appears on an Access menu bar, toolbar, or shortcut menu.	<b>Command</b>
RunMacro	Runs a macro.	<b>Macro Name</b> , Repeat Count, Repeat Expression
RunSQL	Runs an Access action query by using the corresponding SQL statement.	<b>SQL Statement</b> (max 256 characters), Use Transaction (default Yes)
Save	Saves the active object or a specified object.	Object Type (blank to save active object), Object Name (required if select Object Type)
SelectObject	Selects specified database object.	<b>Object Type</b> (default Table), <b>Object Name</b> (not required if In Database Window set to Yes), In Database Window (default No)
SendKeys	Sends keystrokes directly to Access or to an active Windows-based application.	<b>Keystrokes</b> , Wait (default No)
SendObject	Includes the specified Access datasheet, form, report, data access page, or module in an electronic mail message.	Object Type, Object Name, Output Format, To, Cc, Bcc, Subject, Message Text, Edit Message (default No), Template File

**Table QR-38.** *Macro Actions (continued)*

Macro Action	Description	Arguments*
SetMenuItem	Sets the state of menu items (enabled or disabled, checked or unchecked) on the custom menu bar or the global menu bar for the active window.	<b>Menu Index</b> , Command Index, Subcommand Index, Flag (default Ungray)
SetValue	Sets the value of an Access field, control, or property on a form, a form datasheet, or a report.	<b>Item</b> , <b>Expression</b>
SetWarnings	Turns system messages, which can stop the macro, on or off.	Warnings On (default No)
ShowAllRecords	Removes any applied filter from the active table, query result set, or form, and displays all records.	None
ShowToolbar	Displays or hides a built-in toolbar or a custom toolbar.	<b>Toolbar Name</b> , Show (default No)
StopAllMacros	Stops all currently running macros.	None
StopMacro	Stops the currently running macro.	None
TransferDatabase	Imports or exports data between the current Access database or project and another database. Links Access database tables.	Transfer Type (default Import), Database Type (default Microsoft Access), <b>Database Name</b> , Object Type (default Table), <b>Source</b> , <b>Destination</b> , Structure Only (default No)
TransferSpreadsheet	Imports or exports data between the current Access database and a spreadsheet file.	Transfer Type (default Import), Spreadsheet Type (default Microsoft Excel 8-10), <b>Table Name</b> , <b>File Name</b> , Has Field Names (default No), Range

**Table QR-38.** *Macro Actions (continued)*

Macro Action	Description	Arguments*
TransferSQL-Database	Transfers complete database from the current server to another server.	Server, Database, Use Trusted Connection (default Yes), Login, Password, Transfer Copy Data (default Yes)
TransferText	Imports or exports text between the current Access database and a text file. Also links data in a text file or an HTML file to the current Access database. Also exports data to a Word Mail Merge file.	Transfer Type (default Import Delimited), Specification Name (required for Fixed Width text files), <b>Table Name</b> , <b>File Name</b> , Has Field Names (default No), HTML Table Name, Code Page
* Required arguments appear in boldface.		
<b>Table QR-38.</b> <i>Macro Actions</i> (continued)		

Most of the macro actions can be carried out in Visual Basic by using the methods of the DoCmd object. For example, the statement DoCmd.OpenForm "Alpha Card" opens the Alpha Card form in Form view.

The DoCmd object doesn't support methods for the following actions:

- AddMenu
- MsgBox (instead, use the Visual Basic MsgBox function)
- RunApp (instead, use the Visual Basic Shell function)
- RunCode
- SendKeys (instead, use the Visual Basic SendKeys function)
- SetValue (set the value directly in code)
- StopAllMacros
- StopMacro

## SQL Syntax

*Structured Query Language (SQL)* is a language used in querying, updating, and managing relational databases. SQL can be used to retrieve, sort, and filter specific data to be extracted from the database. You can use SQL SELECT statements anywhere a table name, query name, or field name is accepted. For example, you can enter a SQL statement in the Record Source property of a form or report.

Like any language, SQL has reserved words that are used to construct a command or specify an action. The SQL syntax includes statements, clauses, operations, predicates, declarations, and aggregate functions. The following paragraphs list and describe each of these SQL components and give examples of their use.

A *SQL* statement is an expression that defines a command, such as SELECT, UPDATE, or DELETE, and may include *clauses*, such as WHERE and ORDER BY or *predicates*, such as ALL or DISTINCT. Statements are most commonly used in queries, Recordset objects, and aggregate functions, but can also be used to create or modify a database structure.

### The SELECT Statement

The *SELECT* statement is the most common SQL statement and is created behind the scenes when you create a select query. The statement returns information from a database in the form of a set of records, a *recordset*. SELECT statements don't change any of the data in the underlying database. The SELECT statement syntax is

```
SELECT [predicate] { * | table.* | [table.]field1 [AS alias1] [, [table.]field2 [AS alias2] [, ...]]
FROM tableexpression [, ...] [IN externaldatabase]
[WHERE... ]
[GROUP BY... ]
[HAVING... ]
[ORDER BY... ]
[WITH OWNERACCESS OPTION]
```

Part	Description
<i>predicate</i>	Restricts the number of records returned. <ul style="list-style-type: none"><li>■ ALL (default), which returns all records.</li><li>■ DISTINCT, which omits records with duplicate values in the selected fields.</li><li>■ DISTINCTROW, which omits completely duplicate records.</li><li>■ TOP <i>n</i> [PERCENT], which limits the records returned to a specific number or percentage of records from the top or bottom of the data range, depending on the sort order.</li></ul>
*	Includes all the fields from the specified table or tables.

Part	Description
<i>table</i>	Name of the table from which to select the records.
<i>field1, field2</i>	Names of the fields to include in the returned recordset.
<i>alias1, alias2</i>	Substitute names to appear in the column headers in the recordset in place of the field names.
<i>tableexpression</i>	Name of the table or tables that contain the data to retrieve.
<i>externaldatabase</i>	Name of the database that contains the tables from which to retrieve data, if not current database.

**The Select Statement Clauses** The SELECT statement has several clauses that further refine the statement to retrieve only the data you want and in the arrangement you want to see.

- The FROM clause is the only clause required with a SELECT statement. FROM specifies the tables or queries that contain the data to be retrieved. You can use the IN clause with the *externaldatabase* part to specify tables or queries in other than the current database.  
FROM *tableexpression* [IN *externaldatabase*]
- The WHERE clause specifies the criteria to be used to select the records to return. A criteria expression follows the WHERE keyword. The WHERE clause is also used with the UPDATE and DELETE statements.  
WHERE *criteria*
- The GROUP BY clause combines records with the same values in the specified field list into a single record. The field list can contain up to ten fields, the order of which determines the grouping levels from the highest to the lowest. You can also add an aggregate function to summarize the values.  
GROUP BY *groupfieldlist*
- The HAVING clause specifies conditions the grouped records must meet to be displayed, for example, to display records for customers whose total purchase exceeds \$100.  
HAVING *groupcriteria*
- The ORDER BY clause specifies the sort order of the resulting recordset based on values in a specified field or fields. ASC and DESC are keywords used to specify whether the records are sorted in ascending or descending order.  
ORDER BY *field1*, [ASC | DESC][*field2*[ASC | DESC]][*...*]
- The last part of a SELECT statement is the optional WITH OWNERACCESS OPTION declaration, which gives the user who runs the query the same permissions as the owner of the query.

**The Join Operations** When you use the FROM clause to retrieve records from more than one table, you must specify how the tables are related. For this, you add one of the following JOIN operations to the FROM clause.

The *INNER JOIN* operation combines records from two tables if matching values are in a field common to both tables. The INNER JOIN syntax is  
FROM *table1* INNER JOIN *table2* ON *table1.field1 compopr table2.field2*

Part	Description
<i>table1,table2</i>	Names of the tables containing the records to be combined
<i>field1,field2</i>	Names of the fields common to the two tables
<i>compopr</i>	The comparison operator: =, <, >, <=, >=, <>

You can link with several ON clauses by combining the clauses with the logical AND and OR operators.

The *LEFT JOIN* and *RIGHT JOIN* operations are also used with the FROM clause to create an outer join type. The parts and the syntax are the same as for the INNER JOIN operation.

## Action Query Statements

The *SELECT...INTO* statement creates a make-table query. The statement syntax is

```
SELECT field1[, field2[, ...]] INTO newtable [IN externaldatabase]
FROM source
```

Part	Description
<i>newtable</i>	Name of table to be created
<i>externaldatabase</i>	Path to outside database
<i>source</i>	Name of table from which to select records

The *INSERT INTO* statement creates an append query. The statement syntax for a single-record append query is

```
INSERT INTO target [(field1[, field2[, ...]])]
VALUES (value1[, value2[, ...]])
```

The syntax for a multiple-record append query is

```
INSERT INTO target [IN externaldatabase] [(field1[, field2[, ...]])]
SELECT [source.]field1[, field2[, ...]]
FROM tableexpression
```

Part	Description
<i>target</i>	Name of table or query to which to append records
<i>field1, field2</i>	Names of fields to be copied to the new table
<i>value1, value2,</i>	Values to insert in the fields in the new record
<i>externaldatabase</i>	Path to external database
<i>source</i>	Name of table or query from which to copy records
<i>tableexpression</i>	Name of table or tables from which to copy records

The *UPDATE* statement creates an update query. The statement syntax is

```
UPDATE table
    SET newvalue
    WHERE criteria;
```

Part	Description
<i>table</i>	Name of table containing the data you want to update
<i>newvalue</i>	An expression specifying the new value
<i>criteria</i>	An expression specifying which records to update

The *DELETE* statement creates a delete query. The statement syntax is

```
DELETE [table.*]
    FROM table
    WHERE criteria
```

Part	Description
<i>table.*</i>	Name of table from which to delete all records
<i>table</i>	Name of table from which to delete specific records
<i>criteria</i>	Expression that specifies which records to delete

## Data Definition Query Statements

The *CREATE TABLE* statement defines a new table together with its fields and field constraints. The *CONSTRAINT* clause places restrictions on a field and can also create a primary key for the table. The *NOT NULL* clause specifies the new field must contain a valid value. The *CREATE TABLE* syntax is

```
CREATE TABLE table (field1 type [(size)] [NOT NULL] [index1] [, field2 type [(size)]  
[NOT NULL] [index2] [, ...]] [, CONSTRAINT multifieldindex [, ...]])
```

Part	Description
<i>table</i>	Name of table to be created
<i>field1, field2</i>	Names of fields in new table
<i>type size</i>	Data type and size of new field
<i>index1, index2</i>	The CONSTRAINT clause that defines a single-field index
<i>multifieldindex</i>	The CONSTRAINT clause that defines a multiple-field index

The *ALTER TABLE* statement modifies the table design after the table is created with the *CREATE TABLE* statement. The *ALTER TABLE* syntax is

```
ALTER TABLE table {ADD {COLUMN field type[(size)] [NOT NULL]  
[CONSTRAINT index] |  
CONSTRAINT multifieldindex} |  
DROP {COLUMN field | CONSTRAINT indexname} }
```

The parts of the statement are the same as in a *CREATE TABLE* statement. The *CONSTRAINT index* and *CONSTRAINT multifieldindex* clauses are the same as in a *CREATE TABLE* statement.

- The *ADD COLUMN* clause adds a new field to the table and specifies the field type and size, as well as requiring a valid value if the NOT NULL condition is included.
- The *ADD CONSTRAINT* clause adds a multiple-field index to the table.
- The *DROP COLUMN* clause deletes a field from the table.
- The *DROP CONSTRAINT* clause deletes a multiple-field index.

The *DROP* statement deletes an existing table from a database or an existing index from a table. The *DROP* statement syntax is

```
DROP {TABLE table | INDEX index ON table}
```

Part	Description
<i>table</i>	Name of table to be deleted or from which the index is to be deleted
<i>index</i>	Name of the index to be deleted

Two types of CONSTRAINT clauses can be used with the CREATE TABLE and ALTER TABLE statements: one creates an index on a single field and the other creates a multiple-field index. See the SQL Reference Help topic for complete details of the syntax and uses for the CONSTRAINT clause.

## Parameters Declaration

A *parameters declaration* specifies the name and data type of every parameter expected by a parameter query. If included, the PARAMETER declaration appears before any other SQL statement in the query, including the SELECT statement. The parameter declaration syntax is

```
PARAMETERS name datatype [,name datatype [...]]
```

where *name* is the name of the parameter. If the name includes a space, enclose it in square brackets ( []). *Datatype* is one of the SQL primary data types, such as Number, Currency, or DateTime, or a synonym for one of them.

## SQL Aggregate Functions

The *SQL aggregate functions* can be used to perform statistical calculations on sets of values. The same aggregate functions can be used in a query to summarize data or in an expression attached to the SQL property of a QueryDef object. The SQL property is available only from Visual Basic code. Refer to Table QR-31 for a description of the aggregate functions.