



AS/400™

SC21-9614-0

## **Query: User's Guide**





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**Query:  
User's Guide**

#### **First Edition (June 1988)**

This edition applies to Release 1, Modification Level 0, of the following IBM AS/400 programs:

**AS/400 Query:** Program 5728-QU1

This edition applies to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.

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## About This Manual

This manual helps you use AS/400 Query.

This manual may refer to products that are announced, but are not yet available.

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## Who Should Use This Manual

The audience for this manual is anyone who wishes to create query reports and manage data on the AS/400 system.

**Note:** This manual follows the convention that *he* means *he* or *she*.



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## What You Should Know

Before you use this manual, you must be familiar with the introductory material for using the AS/400 system. You do not have to understand how to use a high-level programming language to use Query.



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## How This Manual Is Organized

This manual is arranged in three major parts. The first part contains introductory information, the second part contains information on how to use Query, and the third part contains advanced information on Query.

The last part of this manual contains a glossary and an index. Use the glossary to find the meaning of an unfamiliar term. Use the index to see on which pages the topic is covered.



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## Related Online Information

The following online information is available on the AS/400 system. From any help display, you can press the Help key a second time to see an explanation of how the online information works, including the index search function.

### Help for Displays

You can press the Help key on any display to see information about the display. There are two types of help available:

- General
- Specific

General help explains the purpose of the display. General help appears if you press the Help key when the cursor is outside the areas for which specific help is available.

Specific help explains the field on which the cursor is positioned when you press the Help key. For example, it describes the choices available for a prompt. If a system message appears at the bottom of the display, you can position the cursor on the message and press the Help key to see information about the cause of the message and the appropriate action to take.



To exit the online information, press F3 (Exit). You return to the display on which you pressed the Help key.

## Index Search

Index search allows you to specify the words or phrases you want to see information about. To use index search, press the Help key, then press F11 (Search index) if F11 is available.

## Help for Control Language Commands

To see prompts for parameters for a control language command, type the command, then press F4 (Prompt) instead of the Enter key. You can then obtain additional information for each of the parameters by positioning the cursor on a parameter and then pressing the Help key.

## Online Education

AS/400 online education provides tutorials on a wide variety of topics. To use the online education, press F13 (User support) on any system menu to show the User Support menu. Then select the option to use online education.

## Question-and-Answer Function

The question-and-answer (Q & A) function provides answers to questions you may have about using the AS/400 system. To use the Q & A function, press F13 (User support) on any system menu to show the User Support menu. Then select the option to use the question-and-answer function.

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## Related Printed Information

You will find most of the information you need in this manual. However, if you want to know more about a specific product mentioned in this manual, you should use the information that came with that product.

The following AS/400 publications contain related information you may find useful:

- *Migrating from System/36 Planning Guide*, GC21-9623, provides the application programmer, system administrator, or data processing manager with information to help them migrate their products and applications with the AS/400 System/36 Migration Aid.
- *Migrating from System/38 Planning Guide*, GC21-9624, provides the application programmer, system administrator, or data processing manager with information to help them migrate their products and applications with the AS/400 System/38 Migration Aid.
- *Programming: Backup and Recovery Guide*, SC21-8079, provides information on how to save and restore system objects.
- *Programming: Security Concepts and Planning*, SC21-8083, provides the security officer (or someone who is assigned the responsibilities of a security officer) with information about general security concepts and planning for security on the system.

The following AS/400 Office publications contain related information on data/text merge you may find useful:

- *Office: Word Processing Learning Guide*, SC21-9617, provides the office user with information to help him learn how to use different word processing tasks.
- *Office: Word Processing User's Guide*, SC21-9618, provides the office user with detailed information on how to use the word processing function of AS/400 Office.

The following PC publications might be helpful to you if you are merging a query into a DisplayWrite 4 document:

- *IBM Personal Computer Disk Operating System Reference*, SC21-8090, provides information on how to use DOS on your personal computer.
- *DisplayWrite 4 Reference Guide*, 74X9317, provides procedural information on how to use DisplayWrite 4.
- *DisplayWrite 4 Technical Reference*, 74X9315, provides technical reference information on DisplayWrite 4.

The following publications provide additional information about data base files:

- *Programming: Data Description Specifications Reference*, SC21-9620, describes using the Operating System/400 data description specifications (DDS).
- *Programming: Structured Query Language/400 Programmer's Guide* (to be available at a later date), describes programming using the AS/400 Structured Query Language/400 (SQL/400).
- *Programming: Data Base Guide*, SC21-9659, describes how to set up and use a data base system on the AS/400 system.
- *Programming: Control Language Reference*, SBOF-0481, describes using the AS/400 system commands.
- *Programming: Control Language Programmer's Guide*, SC21-8077, describes using the control language (CL) commands.
- *Utilities: Interactive Data Definition Utility User's Guide*, SC21-9657, describes using the Operating System/400 interactive data definition utility (IDDU).
- *Application Development Tools: Data File Utility User's Guide and Reference*, SC09-1169, describes maintaining data files with the Data File Utility (DFU).





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## Chapter 1. What Is AS/400 Query?

AS/400 Query is an IBM licensed program and a decision support utility that can be used to obtain information from the AS/400<sup>1</sup> data base. It can obtain information from any data base files that have been defined on the system using OS/400 data description specifications (DDS), the OS/400 interactive data definition utility (IDDU), or the Structured Query Language/400 (SQL).

You use Query to select, arrange, and analyze information (data) stored in one or more data base files to produce reports and other data files. You can do this by creating your own query definitions and then running them, you can run existing queries that you did not create, or you can even run a “default” query against a particular data base file (using an unnamed query). You determine what data the query is to retrieve, the format of the report, and whether it should be displayed, printed, or sent to another data base file.

You can use Query to obtain information from a single file or a combined set of up to 32 files. You can select all the fields, or a few of the fields and organize them as you want them to appear in the type of output chosen. You can have all of the records in the files included in the output, or you can select only a few to be included, using record selection tests. These and other functions are described in detail later.

This chapter begins by introducing basic information about Query, and then it introduces all the major tasks (such as creating, displaying, or running query) that can be done using Query, including the data/text merge options that can be used by AS/400 Office and DisplayWrite 4 users.

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### Query Fundamentals (Concepts)

Several elements on your system organize and store information, or data, so that you and other system users can work with it to get the results that you need. The following topics introduce those elements, tell you about them and how they relate to you and Query, and direct you to other publications where you can find more information.

#### Files, Fields, and Record Formats

Information, or data, is organized and stored on your system in various forms, primarily in objects called **data base files** (usually referred to as just **files**). A file contains individual units of information, called **records**, that each contain related pieces of data. Each piece of information in a record is called a **field**, and how the fields are organized is defined in a **record format** (often just called a **format**).

When you run a query to produce a report, Query uses the files, fields, and record formats to get the information you want from the data base, in the form of records, and uses those records to produce a query report.

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<sup>1</sup> AS/400 is a trademark of the International Business Machines Corporation.

For example, an employee name and address file named NAMEADDR might contain a group of records that identify one employee in each record (see Figure 1-1 on page 1-2). Each record has several fields that contain the name and address of an employee. The fields in each record might have names like NAME, STREETADDR, CITY, STATE, and ZIPCODE. This order of the fields might be specified in a record format also named NAMEADDR.

<u>NAME</u>	<u>STREETADDR</u>	<u>CITY</u>	<u>STATE</u>	<u>ZIPCODE</u>
Susan P Gantner	907 Abbey Hwy	Mushroom Manor	OR	67891
Perry C Swenson	19821 Metro Hwy.	St. Paul	OR	67891
Matt F Thomas	961 S 19th Ave	Piney Island	OR	67890

Figure 1-1. Three Records in NAMEADDR File (Using Record Format NAMEADDR)

Another record format, named ZIPADDRESS might be defined for the file that might be location-oriented and contain only the ZIPCODE, STATE, CITY, and STREETADDR fields, in that order (see Figure 1-2).

<u>ZIPCODE</u>	<u>STATE</u>	<u>CITY</u>	<u>STREETADDR</u>
67891	OR	Mushroom Manor	907 Abbey Hwy
67891	OR	St. Paul	19821 Metro Hwy.
67890	OR	Piney Island	961 S 19th Ave

Figure 1-2. Three Records in NAMEADDR File (Using Record Format ZIPADDRESS)

Query retrieves the data you want from the files you choose; it uses certain fields (and record formats) from those files to select, sort, calculate, and summarize that data in the form that you want; and it produces the query reports containing that data.

## Double-Byte Character Set (DBCS) Fields

Some countries use pictograms or symbolic characters in their language. DBCS fields must be used for such data. As a general rule, if your national language uses alphabetic letters instead of DBCS characters, your files do not contain DBCS data. You can ignore any help text that refers to DBCS data. Note that to properly display DBCS data, you need a DBCS workstation.

## Data Definition Languages and Utilities

Query can query data in files that are created using different data definition languages or products. Although the description given above applies to all the files that are on your system, the names or concepts that might be used depends on the programming language or product (like IDDU, DDS, and SQL) that is used to define the files.

If you are not a programmer and you want to create a file that you can query from either Query or Office, you may want to use OS/400 interactive data definition utility (IDDU) to create the file. If a programmer can create the file for you, he might



use IDDU, OS/400 data description specifications (DDS) and AS/400 control language (CL), or Structured Query Language/400 (SQL/400) to create the file.

- IDDU is a menu-driven utility used to define files, fields, and record formats, to store all those definitions in a **data dictionary**, and to create the files so they can be used to store data. A file defined using IDDU can have more than one format. For more information about IDDU, see the *IDDU User's Guide*.
- The **data file utility (DFU)** is used to add, change, and delete data in a data base file. You can use DFU directly, or you can use some of its function through the Enter data option of IDDU'S Work with Data Base Files display. For more information about DFU, see the *DFU User's Guide/Reference*.
- CL and DDS use the same terms and descriptions as IDDU, but they provide additional support for files. Using DDS and CL commands, you can define and create physical files and logical files to indicate how fields are to be organized in files.

A **physical file** actually contains the fields of data, as records, but logical files do not. A physical file has only *one* record format. The field order in a physical file determines the format of the records.

A **logical file** gives a different view of the data stored in one physical file or in several physical files; a logical file does *not* contain data. That is, a logical file lets you see information in records that are stored in physical files as though the records actually existed that way. This is accomplished without having to duplicate and store that data on the system in that logical view (thus, the name *logical* file). A logical file can use a subset of the fields in one physical file, a composite of all or some of the fields in several physical files, or even a mixture of fields from physical and other logical files. Join logical files can have only one record format; nonjoin logical files can have more than one record format.

For more information about physical files, logical files, CL, and DDS, refer to the *Data Base Guide*, *CL Programmer's Guide*, and the *DDS Reference* manual.

- SQL/400 uses a relational model of data; that is, all data is perceived as existing in tables. On the AS/400 system, SQL/400 objects are created and maintained as AS/400 objects. The following table shows the relationship between AS/400 terms and SQL/400 relational data base terms.

AS/400 Term	SQL/400 Term
Library	Data base. Consists of a library, a journal, a journal receiver, a data dictionary, and a SQL catalog. A data base groups related objects and allows the user to find the objects by name.
Physical file	Table. A collection of columns and rows.
Record	Row. The horizontal part of a table containing a serial collection of columns.
Field	Column. The vertical part of a table of one data type.
Logical file	View. A subset of columns and rows of one or more tables.

For more information about relational data bases in SQL/400, refer to the *SQL/400 Programmer's Guide*.

## Query Definitions

You use a query to get information from data base files to produce a report. The file or files that a query uses to get the information and what is to be done with that information is defined and stored in a query definition. A **query definition** is an object (with type \*QRYDFN) and it contains all the details that Query needs to find and use the files in the way you specify, and to produce the results that you expect.

To create a query definition, you follow a sequence of displays that guide you through the process of defining and saving a query definition. Once you have defined your query (and even *while* you are defining your query), you can run it (as a query) to produce the reports that you need.

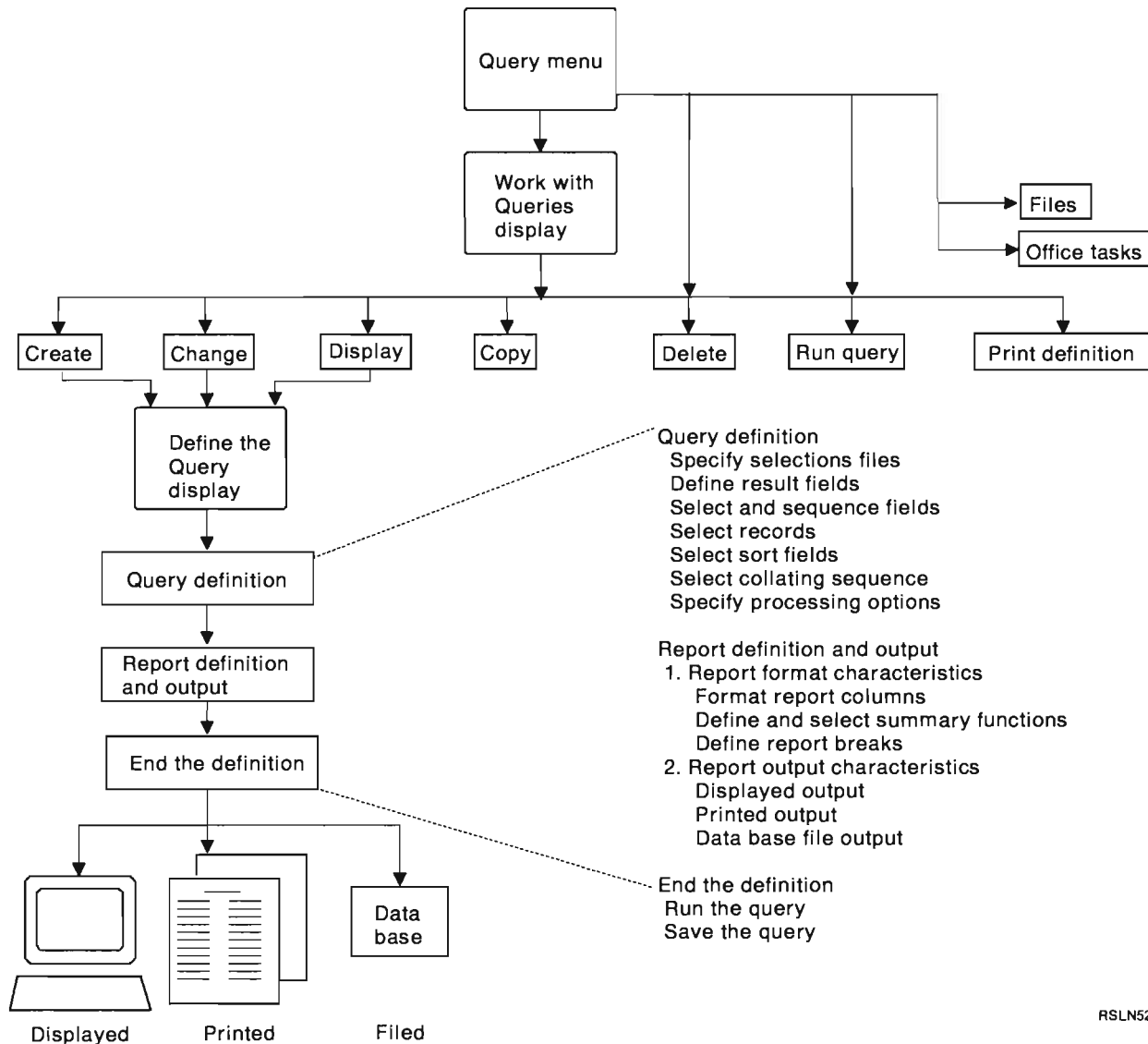
## Libraries

A **library** is a place on the system to store objects, including the query definitions and files that you use in Query. Therefore, when you are working with queries and files, you may need to specify the library where a query or file is stored.

## Major Functions of Query

Two primary Query displays are the starting point for the major tasks that you can do using Query. They are the Query menu and the Work with Queries display. (Another important display is the Define the Query display, which starts all the tasks in a query definition.)

- The Query menu allows you to start working with queries, run a query, or delete a query; it also allows you to start working with files or with office tasks.
- The Work with Queries display allows you to do specific tasks with one or more queries. You can create, change, display, copy, delete, or run a query, print a query definition, or merge (that is, combine) query data into word processing documents.

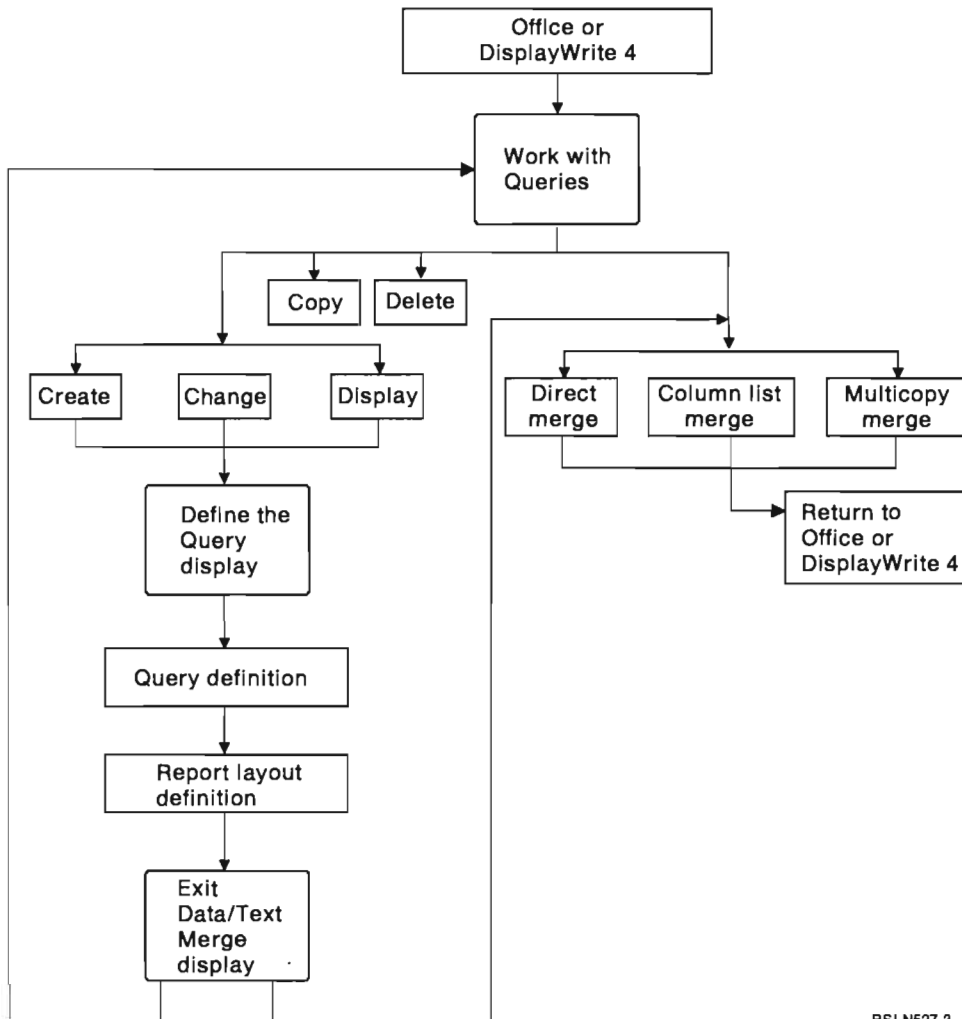


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## Merging Query Data Into a Word Processing Document

If Office or DisplayWrite 4 is available and you are allowed to use it, you can use either one with Query to merge query data into word processing documents created by either product. Query data can be merged into documents in three ways:

- Direct merge (Office or DisplayWrite 4)
- Column list merge (Office only)
- Multicopy merge (Office only)



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Work with Queries

Type choices, press Enter.

Option . . . . . _	1=Create   2=Change   3=Copy   4=Delete
	5=Display   6=Direct merge
	7=Column list merge   8=Multicopy merge
Query . . . . . _____	Name, F4 for list
Library . . . . . QGPL_____	Name, *LIBL, F4 for list

Figure 1-3. Work with Queries Display (Data/Text Merge, All Forms)

## Direct Merge

**Direct merge** does an immediate query of the data base for the information defined in a query.

- For Office, the resulting query report is shown along with the document on a word processing split edit display. You can then copy the report (headings and data) directly into the document that you are working on.
- For DisplayWrite 4, the resulting query report is copied directly into the document at the document's current cursor position.

To merge query data directly into a document you are working with, using either Office or DisplayWrite 4, go to the Work with Queries or the Exit Data/Text Merge display in Query, select option 6 (direct merge), and specify a query and library name. Query immediately runs the query and, without using data field instructions, returns the query report to your document. The report will contain the current data from a data base file (or files), as determined by the query definition used. (The query of the data base file is done immediately, not when the document is being printed later.) For more information on direct merge, see the *Word Processing User's Guide*.

## Column List Merge

**Column list merge** takes information from the definition of the query that you select and creates a set of data field instructions that are returned to Office and shown on a split edit display. (One data field instruction is created for each field selected for use in the query definition.) You then copy these instructions into your document.

You can prepare a document with which you are working in Office to receive query data in column list form by going to the Work with Queries or the Exit Data/Text Merge display in Query, selecting option 7 (column list merge), and specifying the name of a query and a library. When you press the Enter key, Query uses the query name to find the existing query definition and creates the necessary data field instructions from the fields selected in the query. When the instructions are displayed (back in Office), you can copy them into your document.

Later, when the document is processed for printing, these instructions start a query of the data base file(s) specified in the query definition, and the resulting query report is merged into the document in column list form. This form of merging data places all the records from a query into one document in column list format (the same as is done immediately when the direct merge option is used). For more information on column list merge, see the *Word Processing User's Guide* and "Selecting Records for an Office Dependent Column List" on page 7-13.

#### Notes:

1. Column list merge is not available for merging data into DisplayWrite 4 documents.
2. Word processing users who cannot use Query can manually create the data field instructions needed to get the data from the data base. For information about manually creating these instructions, see the topic entitled "Combining Information to Create Documents" in the *Word Processing User's Guide*.

## Multicopy Merge

**Multicopy merge** takes information from the definition of the query that you select and creates a set of data field instructions that are returned to Office and shown on a split edit display. (One data field instruction is created for each field selected for use in the query definition.) You then copy these instructions into your document.

You can prepare a document with which you are working in Office to receive query data in single record form by going to the Work with Queries or Exit Data/Text Merge display in Query, selecting option 8 (multicopy merge), and specifying the name of a query and a library. When you press the Enter key, Query uses the query name to find the existing query definition and creates the necessary data field instructions from the fields selected in the query. When the instructions are displayed (back in Office), you can copy them into your document.

Later, when the document is processed for printing, these instructions start a query of the data base file(s) specified in the query definition, and multiple customized copies of the document (or multiple letters or labels) are printed. One copy of the document is printed for each record selected by the query, and each record includes the current information in all the fields selected in the query definition. For more information on multicopy merge, see the *Word Processing User's Guide*.

#### Notes:

1. Multicopy merge is not available for merging data into DisplayWrite 4 documents.
2. Word processing users who cannot use Query can manually create the data field instructions needed to get the data from the data base. For information about manually creating these instructions, see the topic entitled "Combining Information to Create Documents" in the *Word Processing User's Guide*.

## Combining Column List Merge and Multicopy Merge

You can also combine column list merge and multicopy merge to produce customized documents. That is, you can use multicopy merge to produce several different copies of your customized document, and have a column list merge of unique data included in each of the copies. This is called a **dependent column list merge**. For more information about combined merges, see the *Word Processing User's Guide* and "Selecting Records for an Office Dependent Column List" on page 7-13.

## Chapter 2. General Operating Information for Query

This chapter describes the general operating information for Query, such as getting started with Query, using prompts and lists, how you can check your query definition before it is finished, how to use the function keys, and error recovery procedures.

### Getting Started with Query

You can access Query in a variety of ways. To use Query, you can do any of the following:

- Use the WRKQRY command by typing WRKQRY and pressing the Enter key. This causes the Work with Queries display to appear.
- Select option 3 (Decision support) on the Office Tasks (OFCTSK) menu. From the Decision Support display, select option 2 (Query). This causes the Query menu to appear.
- Select option 8 (Decision support) on the Office menu. From the Decision Support display, select option 2 (Query). This causes the Query menu to appear.
- Use the STRQRY command by typing STRQRY and pressing the Enter key. This causes the Query menu to appear.
- While using Office, press F17 on the edit display. (This is explained in the Office online information and in the manual *Office: User's Guide*.) This causes the Work with Queries display to appear.
- While using DisplayWrite 4, press the control key and F6 on the edit display. Select option 2 (Get query file option). This is explained in detail in the DisplayWrite 4 help facility. This causes the Work with Queries display to appear.

From the Query menu, you can choose to work with queries, run a query, delete a query, work with files, or do an office-related task.

From the Work with Queries display:

- You can create, change, copy, delete, display, print, or run a query if you came from the Query menu or the WRKQRY command.
- You can create, change, copy, delete, or display a query definition, or you can do direct merge, column list merge, or multicopy merge if you came from or Office.
- You can create, change, copy, delete, or display a query definition, or you can do direct merge if you came from DisplayWrite 4.

### When You Are Finished Working with Query

When you are finished working with Query, you can exit from the Work with Queries display by pressing either F3 (Exit) or F12 (Previous).

If you came to Query from DisplayWrite 4 or Office, you can exit Query from:

- The Work with Queries display by pressing F3 (Exit) or F12 (Previous) or by selecting a merge option and pressing the Enter key.
- The Exit Data/Text Merge display by selecting a merge option and pressing the Enter key.

---

## Telling Query What You Want

When you work with a query, Query shows you a series of displays that ask (or prompt) you for:

- What information you want Query to get from a file or files
- Whether you want the information printed or displayed as a report or output as data in another file
- How you want the report to look

Query gathers all of this information from what you enter on the displays.

## Using Prompts and Default Values

Prompts are the system's way of asking you what it needs to know in order to fulfill your request. You need only "fill in the blank." Often, the prompt even lists the possible correct choices, so you only need to type the choice that fits what you are doing. If you are not sure what information you are supposed to supply at a prompt, you can move the cursor to the prompt and press the Help key.

Also, when a display appears, some of the prompts are already filled in. These values are called **default** values—they are the values assumed by the system if you don't specify anything yourself. You can leave a default value the way it is, or if you want, you can change it to another value by moving the cursor to the prompt and typing over the default value.

## Using Query Function Keys

Function keys like Enter, Help, and Print can be used at any time with any query display. However, not all the function keys (such as F1, F3, F4, and F11) apply to all displays. Each display shows, at the bottom of the screen, which function keys are *commonly* used with that display (all of the available keys may not be shown). If you want to know how all of the available keys work on a particular display, move the cursor to the function key section of that display and press the Help key.

## Checking the Results Before Printing the Query Report

Function keys F5 (Report) and F13 (Layout) can be used to check the results of your work at many points in the query definition process. That is, during query definition, you can use these keys to see if you are getting the output results you expected. If so, you can continue on with confidence; if not, you can make whatever changes are necessary to get what you want before you move on to the next definition step. In some situations, looking at the layout may be more useful than looking at the report, and vice versa (for example, F13 can be used when there is no data in a file that is used by the query).

- F5 (Report) uses all the information you have defined so far in this and previous definition steps to run the query and display the results. The results are shown on the Display Report display in report form.



**Note:** If Query finds errors in numeric fields when your query is run, an error message might be displayed or the field value might be shown in the output as plus signs (+++). Plus signs are also used to indicate division by zero and overflow (when the overflow occurs as data is being taken from the file). You can specify that Query ignore any numeric field errors—see “Ignoring Numeric Field Errors” on page 14-2 for more information. Asterisks (\*\*\*\*) are shown if the field length and/or number of decimal positions was changed on the Specify Report Column Formatting display to a size too small for the value to be shown.

- F13 (Layout) uses all the information you have defined so far in this and previous definition steps to show the layout of the fields and column headings without actually running the report.

On the Display Report Layout display, Xs are used to show where character data will be, and 9s are used to show where numeric data will be.

If floating-point fields are present:

- 9s and 0's, followed by E +029, represent single-precision data.
- 9s and 0's, followed by E +299, represent double-precision data.
- You may also see 1.00 for a floating-point field if the data is smaller than the size selected by Query (which is a length of four with two decimal positions).

If DBCS fields are present, you may see:

- Double-byte J's (JJ), which represent DBCS-only data. DBCS-only fields contain DBCS characters only.
- Double-byte O's (OO), which represent DBCS-open (mixed) data. DBCS-open (mixed) fields contain DBCS, alphameric, or a mixture of both types of characters.
- Double-byte E's (EE), which represent DBCS-either data. DBCS-either fields contain all alphameric or all DBCS characters, but not both in the same record.

DBCS characters take twice the amount of space of alphameric characters. A shift-out character precedes DBCS characters, and a shift-in character follows them. Although you must use a DBCS display to type or read data contained in DBCS fields, you do not need to use a DBCS display to display the layout of a report that uses DBCS fields; however, the layout may not be readable.

You can look at the displayed results and determine whether the spacing between columns, the length of each field, and the column headings produce the results you want.

**Note:** The displayed report or report layout will contain *all* the entries or changes that you have made thus far, including those typed just before you pressed F5 or F13.

## Printing What You See on Your Display

You can use the Print key to print a copy of what you see on any Query display at any time. You may find this useful during query definition, for example, when you type many values in the fields on a display, such as on the Define Result Fields display or on the Select Records display. The printed copy of the displayed information is printed on the printer that is associated with your display station.

You can also use the Print key, when needed, to print the displayed output of the function keys F5 (Report) and F13 (Layout). However, only what is shown on the screen will be printed; if your report or layout is wider than the display and you have not specified that line wrapping be used, the far right side of the report will be cut off and will not be printed. In this case, you could use the shift function keys to scroll to the right and then press the Print key again to obtain a printout of the rest (or possibly just more) of the report.

## Using Lists

For many displays, Query provides lists of items that can be used to complete the prompts. Those items might include:

- Libraries you are authorized to use
- Queries you are authorized to use
- Files you are authorized to use
- Record formats for a specified file
- Members for a specified file
- Fields available for your query
- Translate tables

The lists eliminate the need to memorize names, and they also reduce the number of potential typing errors.

## Displaying a List

You can obtain a list of an item (for example, a list of files or a list of libraries) by moving the cursor to the prompt and pressing F4 (List) so that the list appears. Note that you cannot display a list for just any item on a display; the items for which lists are available are signified by a comment next to the prompt that you can use F4 to obtain a list.

You could also obtain a particular subset of a list of items by typing a generic name or a special library name in the prompt or prompts before you press F4. (For more information on special library names, see “Special Library Names” on page 2-5.) Typing a **generic name** (such as ABC\*) in a prompt that allows generic names limits the items in the list by choosing only the items that *begin* with those characters (ABC).

The number of items shown in the list part of the display varies, depending on what form the list is in and the amount of space used by the prompt part of the display. Sometimes a new display will appear that shows the list. If all items in a list do not fit on the display, you can use the roll keys to page forward and backward through the list.

## Selecting Items in a List

You can select an item from a list by doing one of the following:

- Typing the name in the prompt part of the display.
- Typing the name and an option number in the first position in the list.
- Selecting an item directly from the list by typing a number next to the name in the list. By selecting an item directly from the list by typing a number next to it, you often can select more than one item and thus save a lot of time and typing.

You may be able to display, from a list, a long comment about a file, a record format, a file member, or a field. Long comments may provide extensive information about their content. If a long comment is defined for a file, a record format, a

file member, or a field, you can move the cursor to its name and press F23 to display the long comment.

**Note:** If the field is a result field, the entire expression defining the result field is shown as a long comment.

## Special Library Names

You can specify any of the following special library names to search the associated libraries for query definitions, files, or translate tables:

### Special

Library Name	Description
*CURLIB	The current library being used for your job. It is the only library searched.
*LIBL	All the libraries in the library list for your job. They are searched in the order they are listed.
*USRLIBL	All the user libraries that are in the user part of the library list for your job. They are searched in the order they are listed.
*ALLUSR	All the user libraries on the system for which you have the authority to use and QGPL. They are searched in alphabetical order.
*ALL	All the libraries on the system for which you have the authority to use. They are searched in alphabetical order.

If you specify \*CURLIB in the *Library* prompt, Query changes it to the name of the library currently being used in your job. That library name is displayed in place of \*CURLIB.

**Note:** You can use only those libraries for which you have the necessary authority. If you specify a special library name that contains libraries you do not have authority for, you will see queries in only those libraries in that list for which you do have the authority.

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## Using Query Commands

A command is a statement used to request a functions of the system. This means you need only remember a command that is a few characters long instead of remembering all the individual instructions or taking the time to go through a series of menus.

Query uses four commands, which can be entered from any command line:

- **STRQRY** brings up the Query menu.
- **WRKQRY** brings up the Work with Queries display.
- **RUNQRY** runs an existing query, or you can use it to run a default query. This command can also be imbedded in CL programs so that you could, for example, run several queries overnight.
- **DLTQRY** deletes one or several query definitions.

For detailed information about how you may use these commands, see the *CL Reference*.

## Using the Query Menu

The Query menu allows you to select Query tasks for working with queries, running queries that have previously been defined, deleting query definitions, or working with files.

QUERY

Query

Select one of the following:

1. Work with queries

2. Run an existing query

3. Delete a query

20. Files

21. Office tasks

Selection or command  
==>

F3=Exit

F4=Prompt

F12=Previous

If you select **option 1 (Work with queries)** and press the Enter key, the Work with Queries display is shown. On that display, you can specify which query you want to work with and in what way. The tasks that can be started using that display (including additional ways for running and deleting queries) are introduced in “Using the Work with Queries Display” on page 2-7.

If you select **option 2 (Run an existing query)** on the Query menu, you are shown the prompt displays for the Run Query (RUNQRY) command. You can use this command to run a query and produce a query report of the data selected from one or more data base files. You can use this command to run an existing query (one that is defined and stored by name on the system) or to run a “default” query (one that is unnamed and that uses mostly system-supplied values). If you do not know the name of a query or library, use option 1 (Work with queries) so that you can get a list of queries and libraries.

If you select **option 3 (Delete a query)** on the Query menu, you are shown the prompt display for the Delete Query (DLTQRY) command. You can use this command to delete a query definition. If you do not know the name of a query or library, use option 1 (Work with queries) so that you can get a list of queries and libraries.

There are other tasks that you can do that are not part of Query but may be related to it or may be convenient to get to from the Query menu:

- If you select **option 20** to work with files, the Files (FILE) menu is displayed. From that menu, you can do a file-related task (display, copy, delete, save, restore, or edit) or you can use a different file-related utility or licensed program, such as IDDU, DFU, or SQL/400. For example, you can use IDDU to define and create files, and you can use either IDDU or DFU to type data into the files.

- If you select **option 21** to do an office-related task, the Office Tasks (OFCTSK) menu is displayed. From that menu, you can choose to work with documents or folders, with office security, or with Office Support or AS/400 PC Support.

## Using the Work with Queries Display

The Work with Queries display is the major starting point for working with one or more queries at a time. Using this display, you can select (and, therefore, start) one or more of the following primary tasks:

- Create a new query definition
- Change, copy, display, or delete an existing query definition
- Print the definition of a query
- Run a query to select data from files and produce a report using that data
- Merge query data (or data field instructions) into Office or DisplayWrite 4 word processing documents

If you start in Query without coming from Office or DisplayWrite 4, you can do all the tasks listed in the first four items of this list. You can create, change, copy, delete, or run one or more queries, or print their definitions. (These are the options shown on the display in Figure 2-1 on page 2-9.)

However, if you came into Query while using Office or DisplayWrite 4, you cannot run a query in the normal way nor can you print a query definition, but you *can* get (or query) data and merge it into a word processing document that you are working with. (The options that are available for word processing are shown in Figure 1-3 on page 1-7, and they are described in “Merging Query Data Into a Word Processing Document” on page 1-6.)

Part 2 of this manual describes these primary Query tasks. Creating query definitions is described in Chapters 3 through 14, running queries is described in Chapter 15, and the remaining tasks (changing, copying, displaying, printing, and deleting query definitions) are described in Chapter 16.

## Choosing a Single Query Task

To work with a query, you need to determine which query you want to work with, and you need to select the task you want to do. To select a task, you can type the number of the task you want to do in the *Option* prompt on the Work with Queries display, or if a list of query names is shown, you can type the number of the task in the *Opt* column (as shown in Figure 2-1 on page 2-9). These are the tasks that you can choose from:

Query Task	Description of Task
1 = Create	Creates (defines) a new query. When this option is processed, the Define the Query display is shown so you can start defining a query.
2 = Change	Changes an existing query definition. The Define the Query display is shown for this option also.
3 = Copy	Copies an existing query definition. The Copy Queries display is shown.
4 = Delete	Deletes an existing query definition. The Confirm Delete of Queries display is shown.

5 = Display	Shows the definition of a query without being able to change it. (To change the query, choose option 2.) The Define the Query display is shown.
6 = Print definition	Prints a query definition. For more information, see “Printing a Query Definition” on page 16-9. (This option is not available if you came to Query from Office or DisplayWrite 4.)
9 = Run	Runs a query. Query displays a report, prints a report, or puts the data into a data base file, depending on what is specified in the query definition. For information about running queries, see Chapter 15. (The run option is not available if you came to Query from Office or DisplayWrite 4.)

### Choosing a Query Task for Data/Text Merge

If you came to the Work with Queries display from Office or DisplayWrite 4, the choices for the *Option* prompt are different, to support the three types of data text merge that you can use Query for. As shown in Figure 1-3 on page 1-7, these word processing options are, for Office, 6 (Direct merge), 7 (Column list merge), and 8 (Multicopy merge). For DisplayWrite 4, the word processing option that is available is 6 (Direct merge). The merge option(s) are shown instead of the Print definition and Run options (6 and 9), which are not available for a word processing user. For a description of the data text merge options, see the topic “Merging Query Data Into a Word Processing Document” on page 1-6.

### Specifying a Query and Its Library

To identify the query you want to work with, you can type the name of the query (in the *Query* prompt) and the name of the library (in the *Library* prompt) in which it is to be stored (or is already stored). (Or you can look at a list of query names or library names and then select the name you want—see “Choosing Multiple Query Tasks.”)

If you specify the name of a query, Query assumes that it already exists and searches for it in the library specified in the *Library* prompt. If you specified a special library name (such as \*LIBL) or a generic library name (such as ABC\*), the first query found with the name you specified is used; the order that the libraries are searched is alphabetic (except for \*LIBL and \*USRLIBL).

If you are creating a query, you do not need to name it unless you want to save it for later use. For more information on creating queries, see Chapter 3, “Creating a Query Definition.”

### Choosing Multiple Query Tasks

If you position the cursor on the *Query* prompt and press F4 to show a list, the list contains the names of all the queries that are in the library (or libraries) indicated by the *Library* prompt. Only the queries and libraries for which you have the necessary authority are shown. (The following display shows some sample query names.)

Work with Queries			
Library . . . . .	QGPL	Name, *LIBL, F4 for list	
Subset . . . . .		Name, generic*	
Position to . . . . .		Starting character(s)	
Type options (and Query), press Enter.			
1=Create 2=Change 3=Copy 4=Delete 5=Display 6=Print 9=Run			
Opt	Query	Opt	Query
-	ACCTPAYFEB	-	PAYROLLMAR
-	ACCTPAYMAR		
-	ACCTRECFEB		
-	ACCTRECMAR		
-	INTFEB		
-	INTMAR		
-	INVFEB		
-	INVMAR		
-	PAYROLLFEB		
			Bottom
F3=Exit	F4=List	F5=Refresh	F11=Display text
F12=Previous			

Figure 2-1. Work with Queries Display (multiple-column list)

You can type any option number (except a 1) beside the name of each query that you want to select from the list. If selecting multiple queries, you can select and mix the options (except data merge options 6, 7, and 8, when they are available) according to the types of work you need to do. For example, if you need to run a query, delete another query, and copy a third query, you can page through the list looking for the query names and select all three options on this display at one time. If you wish, you can also type an option number (including 1) and a query name in the top position of the list as well. (If you came to Query from Office or DisplayWrite 4, the merge options 6, 7, and 8 cannot be used with any other option; only one of them can be selected at a time.)

You can select as many as 30 queries from the list, as well as type a query name and option in the first list position of this display. Query processes the requests in the order that they appear in the list, starting first with the option and query that you typed in the first list position (in the input fields of the *Option* and *Query* columns).

When you select multiple options and the list contains multiple columns of names only (such as in Figure 2-1), the processing order of the columns is top to bottom and left to right. That is, Query processes all the selected queries in the leftmost column first, then the second column, and so on. (However, if the selected options include queries that are to be copied or deleted, Copy Queries or Confirm Delete of Queries displays are shown when the first query with one of those options is found. Then Query groups together all others with the same option, by library, for you to verify what you want done.)

## Working with a List of Queries

When you work with a list (in this case, a list of queries), Query provides several functions to help you. Here are some possibilities:

- To see all the queries in a different library or group of libraries, you can press the Enter key after changing the value in the *Library* prompt and typing blanks or an asterisk (\*) in the *Subset* prompt. You are shown all the queries that you have the authority to use that exist in that library or group of libraries. (You

indicate which libraries are to be checked by specifying a library name, a special library name [such as \*LIBL], or a generic library name [in the form of ABC\*] in the *Library* prompt.)

- To see a particular subset (a smaller group) of query names, you can type a generic name (in the form of ABC\*) in the *Subset* prompt and press the Enter key. If you know at least the starting characters in the name you are looking for, this function can reduce the time needed to locate it.
- To see if more than one library contains a specific query name, you can type that query name in the *Subset* prompt and type \*ALL in the *Library* prompt before you press the Enter key. You are shown all the queries by that name for which you have the authority to use.
- To position the list to a specific name, type the name (or the starting characters in the name) in the *Position to* prompt and press the Enter key. This function can also reduce the time needed to locate a name.
- You can also use a combination of these things at the same time. For example, you could specify a different library name, generic library name, or special library name in the *Library* prompt, a subset value (of query names) in the *Subset* prompt, a specific query name or the starting characters of a query name in the *Position to* prompt, and then press the Enter key to show the desired subset list of query names.

These functions are described in the following topics.

### Selecting a Query Name from a List

If you are working with a list of queries, you can select a query by using one of the following methods:

- You can use the top position in the list to type the name of a query (and library name, if the *Library* column is shown) you want to create or use. (To select an existing query, it must be available for use—see “Other Considerations” on page 2-12.)

If you are creating a query, you can check this list to see what names are already used before you type a new name. Then, type the new name in the first list position (in its input field) and type a 1 next to it. (You must also include a library name if the *Library* column is shown.)

- You can work with a query (or queries) in the list by typing an option next to the query(s). (To select a query, it must be available for use—see “Other Considerations” on page 2-12.)

### Using List Subsets

You can use the *Subset* prompt to see a smaller group (subset) of query names. To do so, type the starting characters (in the form of ABC\*) that identify the group of queries that you want to display, and press the Enter key. All the queries whose names start with those characters in the specified library or library group are shown. For example, if you typed IN\* in the *Subset* prompt, you might see a list of query names like: INTEREST, INTFEB, INTMARCH, INVENTORY, INVFEF, INVMARCH, and so on. (The libraries are shown in alphabetical order, and the queries are shown alphabetically for each library.)

You can also specify a complete name (without an \*) in the *Subset* prompt. Continuing the previous example, if you wanted to see which libraries contained queries named INVENTORY, type that complete query name in the *Subset* prompt.



If you want to return to the full list previously shown, blank out the subset value (or type an \* as the subset value) and press the Enter key again.

### Positioning a List of Queries

When a list of query names is shown, they are shown in alphabetical order within each library. If it is a long list, you may want to move (change the position within) the list so that it starts with a particular query name. You can do this by typing one of the following in the *Position to* prompt:

- All of the characters in an existing query name
- One or more of the starting characters in the name

When you press the Enter key, Query moves the list so that the fully specified name (or, in a list for a specific library, the first name with the specified starting characters) is now shown at the top of the list.

If there is no *Library* column present and if there is no query name in the list that starts with those characters, Query moves the list to the name closest to, and in front of, the position that the name would have been in. However, if there is a *Library* column present and there is no query name that exactly matches the value in the *Position to* prompt, the list is not repositioned.

Two other methods are also available to move through a long list of queries:

- You can use the roll down and roll up keys to go forward or backward through the list.
- You can use F19 (Next group) to advance to the start of the next library's list of query names.

### Using F11 to Display Additional Information

When a list is displayed, you can use F11 to alternate between showing a list of just the item names (such as queries, fields, and so on) and showing a list of both the item's name and the text that describes each item. When you press F11 (Display text), the text—if any was specified when the query was created or changed—is shown next to each item name in the list. Some additional information may also be shown; for example, when you display the text for a list of queries, the date that each of the queries was created or last changed is also displayed.

Following is an example of how the Work with Queries display might appear when the F11 key is used.

Work with Queries			
Library . . . . .	QGPL	Name, *LIBL, F4 for list	
Subset . . . . .		Name, generic*	
Position to . . . . .		Starting character(s)	
Type options (and Query and Library), press Enter.			
1=Create 2=Change 3=Copy 4=Delete 5=Display 6=Print 9=Run			
Opt	Query	Text	Changed
-	ACCTPAYFEB	Accounts payable for February	02-29-88
-	ACCTPAYMAR	Accounts payable for March	03-31-88
-	ACCTRECFEB	Accounts receivable for February	02-29-88
-	ACCTRECMAR	Accounts receivable for March	03-31-88
-	INTFEB	Customer acct interest accumulated - Feb.	02-29-88
-	INTMAR	Customer acct interest accumulated - March	03-31-88
-	INVFEB	Ending inventory for February	02-29-88
-	INTMAR	Ending inventory for March	03-31-88
-	PAYROLLFEB	Total payroll, by day, for February	02-29-88
			More
F3=Exit	F4=List	F5=Refresh	F11=Display names only
F12=Previous			

After you press F11, all lists on all the Query displays that use F11 are shown in the form you chose until you press F11 again.

## Other Considerations

You should be aware of other considerations when you are trying to locate or use a particular query. To use a query:

- You must have the authority needed to use the query definition. You may need to either ask the owner of the query, the administrator, or security officer to give you the type of authority that is necessary. For more information about the types of authority, see "Giving Authority to Others for Your Query" on page 15-3.
- You must have the authority needed to use the library containing the query definition.
- The query (or the library) must not be in use in such a way that it cannot be shared. For example, if the owner is making changes to the definition of the query or if the system operator is saving the library that contains the query, you may need to wait a short time before you can use the query. If the *Text* and *Changed* columns are blank in a query list with the text displayed, the query is being used.

## Selecting a Library

The library name indicates where you want to store a new query or where an existing query is already stored. (If you are creating a query, you do not need to specify a library name if you do not intend to save the query.) Also, if you decide later during query definition that you do want to save the query, you are given another opportunity to specify (a query name and) a library name, at the end of definition time.

If this is the first time you are using Query, your current library is supplied as the library name. If you do not have a current library, QGPL is used. When you specify a different library name, a special library name, or a generic library name, Query supplies that name the next time you use this display. You can use the same value

each time, or you can change it to a different library or library group. (See “Query Profile Information” on page 2-13 for more information.)

To look at or use a different library, or a list of libraries from which you can choose, do either of the following:

- Type the name of the library, a generic library name, or a special library name in the *Library* prompt and press the Enter key. A list of all the *queries* in that library or group of libraries for which you have the authority to use is shown. If there are multiple libraries, the queries are listed in alphabetical order within each library. The libraries themselves are shown in alphabetical order if \*ALL, \*ALLUSR, or a generic library name is specified. If you specify \*LIBL or \*USRLIBL, the libraries are shown in the order that they are listed in the library list.

If you specify a library name or special value that contains no query definitions (or none that you have authority to use), a message is displayed indicating there were no queries.

If the list of queries is not empty but one of the libraries in the group is being used or is damaged, a message is displayed indicating that the list may be incomplete.

- Move the cursor to the *Library* prompt and either leave the prompt blank or type a generic name or a special library name, then press F4 to list the libraries. A list of the *libraries* that you are authorized to use is shown.

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## Query Profile Information

Query creates and maintains a query profile for each user. The profile is automatically created the first time you use the Query utility program, and its values are updated automatically whenever you specify certain values or press certain keys. *You do not have to worry about creating or changing this profile.*

You may notice that some prompts on some of the displays are already filled in when the display is first presented to you. These values may have been obtained from your profile; Query uses your profile to make your definition tasks easier by providing certain information at the appropriate time.

The values that are stored in your Query profile are:

- The library you last used on the Work with Queries display
- The library you last used to specify your first file selection on the Specify File Selections display
- The library you last used to specify where data base file output was to be stored
- Your list column mode (whether displays are to show names and text or just names only)
- Your report/layout screen width (80 or 132)
- The current collating sequence option
- Your collating sequence
- The collating sequence table and library name

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## Handling Query Messages and Errors

You should not worry about making errors while working with Query. Query will either prompt you for needed input or issue an error message. You can correct your errors by responding to either of these. If you want to obtain help for any message that Query issues to you, move the cursor to the message line and press the Help key.

Some of the things that may go wrong are:

- You specify a value that is not listed as a possible choice.
- You are not authorized to use a query, file, or table that you specified, or a file is currently being used.
- You change your mind after entering something.

## Changing Your Mind

Whether you change your mind about something you have already entered because it was a mistake or because you thought of a better way to get what you want, you will find it is very easy to change things in Query.

If you are still creating or changing your query, you can go back to previous displays by using F12. If you press F12 on a display, all of the new entries or changes you made on that display are ignored. Pressing F10 on a display keeps all of your new entries or changes and shows you the previous display. You can also return to the Define the Query display and choose the option(s) that you want to change or add.

If you define and save the query before you notice that the results are not what you want, just choose option 2 (Change) on the Work with Queries display and change the query. When changing a query, you select only the option(s) that need to be changed and then, when you are shown the appropriate display, you need only type the new choices or change the incorrect ones. Everything else you defined earlier remains defined; you do not have to redefine the whole query.

If you just want to quit, press F3 (Exit) on the Exit This Query display. On the Exit This Query display, indicate whether or not you want to save and/or run the query; then pressing the Enter key will show the Work with Queries display. Press F3 (Exit) to exit Query.

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## Practicing with Query

Appendix B, "Practice Exercise for Query" provides practice examples that you can do in order to quickly become familiar with Query.

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## Chapter 3. Creating a Query Definition

This chapter describes the process of creating a query (that is, defining a query definition object) that can be used to query one or more files in the AS/400 data base. The chapter begins with selecting the Create option (option 1) on the Work with Queries display, and then it introduces the Define the Query display and the 11 possible definition steps you can use to define a query or change part of an existing query definition. The details for each of the definition steps are described later, in Chapters 4 through 14. The details for each of the other major tasks then follow in Chapters 15 and 16.

### Starting Query Definition

You start query definition by selecting option 1 (Create) on the Work with Queries display and, optionally, by specifying the name of the query you want to create.

To specify a query name, you can type the name of the query (in the *Query* prompt) that you want to define, and you can specify the name of the library (*Library* prompt) in which it is to be stored. Or, you can look at a list of query names or library names to select the query name and the library name you want to use.

For example, you might specify CUSNAMQRY as the name of a query definition that you would use to query the CUSTNAME file. If you do not specify a library name, the query will be stored in the library identified in the *Library* prompt (the QGPL library, in this example).

Work with Queries

Type choices, press Enter.

Option . . . . . _	1=Create 2=Change 3=Copy 4=Delete
	5=Display 6=Print definition
	9=Run
Query . . . . . _____	Name, F4 for list
Library . . . . . QGPL	Name, *LIBL, F4 for list

F3=ExitF4=ListF5=RefreshF12=Previous

If you are creating a query (definition), you do not need to name it unless you want to save it for later use. (The query does not exist as a definition object on the system until you save it.) If you do name it, use the normal rule for naming objects, which follows.

The query name must begin with an alphabetic character (A through Z, \$, #, or @) and can be followed by no more than 9 alphanumeric characters (A through Z, 0 through 9, \$, #, @, ., or \_). Because most system-supplied objects on the AS/400 system begin with Q, your query names should not start with a Q.

If you position the cursor on the *Query* prompt and press F4 to show a list, it will contain the names of all the queries that are in the library (or libraries) indicated by the *Library* prompt. You can get a smaller list by typing a generic name in the *Query* prompt before you press F4. The generic name will show in the *Subset* prompt when the list is shown.

When you are creating a query, you can check this list to see what names are already used before you choose a new name. Type the new name in the first list position (in its input field) and type a 1 next to it.

For more information on using lists on the Work with Queries display, see “Working with a List of Queries” on page 2-9.

---

## Selecting Definition Steps When Defining a Query

When you specify option 1 (Create) on the Work with Queries display, you are shown the Define the Query display (another key display) where you select one, several, or all of the 11 definition steps (options) needed to define your query.

The only definition step that you are required to select is *Specify file selections*. You *do not* have to select all of these definition steps—use only those that you need. Most of these steps do not have to be done in a specific order (although the order shown is recommended when you need to use most of them). Each step you select is a separate process that shows you one or more displays as you need them.

Define the Query

Query . . . . . :                      Option . . . . . : Create  
Library . . . . . : QGPL

Type options, press Enter. Press F21 to select all.  
1=Select ('>' identifies previously defined options.)

Opt	Query Definition Option
1	Specify file selections
-	Define result fields
-	Select and sequence fields
-	Select records
-	Select sort fields
-	Select collating sequence
-	Specify report column formatting
-	Select report summary functions
-	Define report breaks
-	Select output type and output form
-	Specify processing options

F3=Exit  
F13=Layout

F5=Report  
F18=Files

F12=Previous  
F21=Select all

The Define the Query display is the primary display from which you start defining your query.

From this display, you can select options that define, generally speaking, the four major parts of a complete query definition:

- The first six options define **the query itself**, including the key ones about: what *files* you want to query, what *fields* are to be used in each file, and what *records* are to be selected.
- The next three options define **what the report is to look like**, including which columns are to be summarized and when (using report breaks).
- The second to last option defines **where the report is to go** and what values are to be used when it is sent there.
- The last option defines **how numeric results are processed**.

## Making Your Choices

To select options that you want to use from those listed in the *Query Definition Option* column, type a 1 in the *Opt* (option) column beside each of those options, then press the Enter key. The displays for the options you select are then shown one after the other so you can create those parts of the query definition.

Following are brief descriptions of each of the definition steps.

### Specify file selections

This option is required, and you use it to specify the file or files from which you want your query to obtain information. If you specify more than one file, you are shown the displays on which you specify how you want the files joined.

### Define result fields

Use this option to define fields that do not exist in your files but you want to use in your query. For example, your selected file(s) contains a field representing the number of weeks, but it does not contain a field representing the number of days, and you want your report to show days, not weeks. You can define a result field that will hold the results of a calculation that uses the number of weeks to determine the number of days.

### Select and sequence fields

Use this option to select the fields (from your selected file(s) and your result fields) that you want to appear on your report. You also specify in what order you want them to appear.

### Select records

Use this option to select records, from your selected file or files, if you only want particular records to be included in your report.

### Select sort fields

Use this option to specify what fields to sort on so that your output records appear in a particular order (such as alphabetically or in descending or ascending order).

### Select collating sequence

Use this option to select a collating sequence for your query. The collating sequence you select can affect many different things in your query: record selection, the order of records when they are sorted, and so on. The collating sequence relates to your country's language. You can set your collating sequence while defining your first query and never have to change the collating sequence again.

### Specify report column formatting

Use this option to change the column headings, column spacing, length, and decimal positions for fields that appear in your report.

#### **Select report summary functions**

Use this option to select the fields you want totaled, average, minimized, maximized, or counted within your report.

#### **Define report breaks**

Use this option to specify how to break your report into groups of records.

#### **Select output type and output form**

Use this option to specify whether you want your output to be displayed, printed, or sent to a data base file. If you want your output printed, you also specify printer attributes. You also use this option to specify whether you want detailed or summary-only output.

#### **Specify processing options**

Use this option to specify whether you want the results of your query's calculations to be truncated or rounded and whether you want numeric field errors ignored.

You can specify one, several, or all of the options shown. To select *all* of them, press F21.

### **Moving Through the Definition Displays**

For each option you select, Query shows you the definition displays for that step. (The words shown for each option on the Define the Query display match the title of the first display shown for that definition step.) After you specify your definition values on a display, press the Enter key to have them included in the query definition and to go to the next display in the sequence. Whenever you need to back up in the sequence, press F10 (Process/Show Previous) to keep what you have entered on a display and then show the previous display, or press F12 (Previous) to ignore what you have entered on a display and then show the previous display.

After you go forward through all of the options that you need, press the Enter key to return to the Define the Query display. Then, you can select more options, change your selections, or end the definition of this query.

### **When You Return to the Define the Query Display**

When you return to this display, Query displays a > symbol beside all those definition steps that currently have definition values that are different from the system-supplied (default) values. This is also true if you are changing or displaying an existing definition.

Also, if you are creating or changing a definition, a message is shown to remind you to press F3 (Exit) to save the query changes and/or run the query at this time.

When you press F3, the Exit this Query display is shown so you can specify both choices. (If you want to look at or change more definition steps first, you can type a 1 next to each option as before, and press the Enter key.)

If there are any definition errors in the options you used, they are highlighted in reverse image when you return to this display; you should correct the errors before you use the Exit key.

## Considerations for Creating Queries

The following are reminders, tips, and techniques for creating queries.

### Selecting Files, Records, and Fields

Query can use files created using IDDU, DDS, or SQL/400. For a description of file organization, see the *IDDU User's Guide*, the *Data Base Guide*, or the *SQL/400 Programmer's Guide*.

When you create a query, if you do not select and sequence the fields to be reported by the query, Query selects the following:

- For reports, the first 500 of the following:
  - Fields chosen as sort fields on the Select Sort Fields display, in the sequence they appear on that display
  - Result fields in the order they are defined on the Define Result Fields display
  - Fields that can be used by Query in the record format(s), in the sequence they appear in the record format(s) (those in the first file selection, followed by those from the second, and so on)
- For data base output:
  - All data in the record format
  - Result fields defined on the Define Result Fields display

For data base output, the output is limited to a maximum record length of 32,766 characters. For displayed or printed output, choose a report width that allows your report to be easily read.

### Suggested Sequence of Tasks

1. Define result fields before selecting and sequencing fields.
2. Specify comparisons used for selecting records before selecting and sequencing fields.
3. Select and sequence fields and specify sort fields before you reformat columns.
4. Select sort fields before you define report breaks.
5. Press F5 to view your query results and F13 to view your report layout before and after you reformat columns.

You can use a query to quickly sort records in a data file. Simply select the sort fields, choose data base as the output device, and specify the output data base name.



## Chapter 4. Specifying and Selecting Files for a Query

This chapter describes how you select and use one or more data base files that are to be queried for information. Specifying file selections (the first option on the Define the Query display) is the first of the 11 steps that you can use to define a query. This step includes specifying (or changing) what files you want to select for your query, seeing what files are already selected, and specifying the join characteristics when more than one file is selected. This step also allows you to select, when necessary, file members and record formats for the files.

### Notes:

1. Although this chapter discusses this step primarily for the task of *creating* a query definition, most of the information also applies to the tasks of *changing* or *displaying* an existing definition.
2. If you are creating a query, a 1 is already supplied by the system for the *Specify file selection* option on the Define the Query display, and it cannot be removed. This is the *only* option in the definition process that you *must* select when you are *creating* a query.
3. If you make changes to any of the file selection values in this step, Query attempts to keep whatever parts of the definition that are still valid. For example, if a field in a file being removed from the definition also exists in a file being added (as a replacement), the field's uses in other parts of the definition (such as part of the sort definition) are kept. (However, it is your responsibility to determine whether or not the field in the replacement file contains the kind of information you want.)

The displays related to the file selection process are:

- File selection displays (for one or more files):
  - Specify File Selections
  - Select Library (optional)
  - Select File (optional)
  - Select Member (optional)
  - Select Record Format (optional)
- File join displays (for multiple files only):
  - Specify Type of Join
  - Specify How to Join Files

## Specifying File Selections

The file selection process includes selecting each file from which your query will get data and also specifying the library containing the file, the file member, and the record format (or using the values supplied by Query when the display first appears). If you select multiple files, the process also includes specifying the file join characteristics.

After you have selected your definition steps on the Define the Query display and you press the Enter key or F21 (Select all), the first display that you see is the Specify File Selections display.

Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .		Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	*FIRST	Name, *FIRST, F4 for list

F3=Exit	F4=List	F5=Report	F9=Add file
F12=Previous	F13=Layout	F18=Files	

The Specify File Selections display is used to specify one or more data base files that you want to query for the data in your report. You can specify as many as 32 files to be queried, and you can assign unique 3-character identifiers to each one. (You can also specify the same file twice, if you need to join it to itself; if you do, it counts as two files in the query definition. For example, you might specify the same file twice but use two different record formats.)

If you are creating or changing a query definition, you should complete all the information needed for one file selection before you start on the next one. Based on the values you enter and the key you press, Query shows you the displays you need. The order of prompting within each file selection is: library, file, member, and record format. (If you have not completed all the information in a file selection, several of the F keys will not work until you supply the needed information.)

The following special values are shown in the prompts for each file selection group when it is first shown: \*FIRST (for members and record formats) and \*ID (for file IDs if shown). These and others that you may specify (like \*LIBL for libraries) are changed when you press the Enter key; they are changed to the actual values that will be used when the query is run. Special values for member names are not changed.

The initial value shown in the *Library* prompt of the first file selection group is the value that you used in the file selection step in a previous query definition. For the rest of the file selections, the initial value is the same as is used in the first group.

**Choosing a File**

To choose a file, move the cursor to the *File* prompt and type the name of a file.

If you want to choose a file from a list of file names, you can press F4 (with the cursor at the *File* prompt). The Select File display is shown, and on this display you can choose one or more files for your query.

**Note:** If the *File* prompt is blank before you press F4, you can select multiple files from the Select File display; if it is not blank, you can select only one file.



## Choosing a Library

Because the files you want to select may be in different libraries, you can specify a different library name, generic library name, or special library name for each file selection.

- If you type a generic library name (in the form of ABC\*) or special library name in this prompt and press the Enter key, that library group is searched for the file named in the *File* prompt. If the file is found in one of the libraries, the name of that library replaces the special library or generic name.
- If you type a generic library name (in the form of ABC\*) or a special library name and then press F4 with the cursor in this prompt, the specified list of library names is shown on the Select Library display. When you select the library you want from the list and press the Enter key, you return to this display with the selected name filled in. For an explanation of these special library names, see “Special Library Names” on page 2-5.

The initial value shown in this *Library* prompt of the first file selection is the value that you used in the file selection step in a previous query definition. For the rest of the file selections, the initial value is the same as is used in the first group.

If you specify \*CURLIB as the library name for a file selection and you do not have a current library, QGPL replaces the \*CURLIB value.

## Choosing a Member or Record Format

Similarly, for each file selection, if you want to choose from a list of members or record formats, move the cursor to that prompt and press F4 to see the associated display, and select the member name (or format name) you want to be used with that file. Then, when you return to the Specify File Selections display, that name is shown in the prompt. If you did not select a member name, Query supplies \*FIRST in the *Member* prompt. If you did not select a format name, Query resolves the special default value and supplies the first format name in the *Format* prompt.

## Selecting Multiple Files

If you want to include additional files for your query, press F9 (Add file) each time you want another file selection. If you have completed the previous file selections for this query, a new group of prompts is shown for you to fill in; the *File* prompt is blank, and the other prompts show default values that you can change. (However, if you have not filled in a file name for one of the file selections, F9 moves the cursor to the blank *File* prompt instead of giving you a new file selection.)

Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .	EXAMPFILE	Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	*FIRST	Name, *FIRST, F4 for list
File ID . . . . .	*ID	A-Z99, *ID
File . . . . .	_____	Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	*FIRST	Name, *FIRST, F4 for list
File ID . . . . .	*ID	A-Z99, *ID

Bottom

F3=Exit
F4=List
F5=Report
F9=Add file

F12=Previous
F13=Layout
F18=Files

If you are working with multiple files on this display, use the roll keys to move forward or backward in the list of file selections. If you press F18 (Files), you can also see this information in a different form; F18 takes you to the Display File Selections display and shows you the names of all the files, libraries, file members, record formats, and file IDs for all the files currently defined in this query definition.

If you try to leave the Specify File Selections display before you specify how multiple files are to be joined, Query assumes that the type of join is a 1 (Matched records) and shows you the Specify How to Join Files display so you can specify the necessary join test specifications.

## Using File IDs

File IDs are used when you select more than one file. Although Query assigns a file ID value to each file selection, you can specify your own identifier.

**Note:** When you are creating a query, the *File ID* prompt is not shown for your first file selection. However, if you select more than one file, you will see that Query has assigned the value T01 as the file ID of your first file. You will have to go back and change the file ID if you want to assign your own file ID values.

The file ID allows you to uniquely identify fields that have the same name but are in different files. You can specify from one to three characters; the first character must be alphabetic, \$, #, or @, and the last two can be alphabetic, numeric, or \$, #, or @. Examples of valid identifiers are: A, B, B03, AEX, and \$99.

If you do not specify a file ID (that is, you do not change the value \*ID in the *File ID* prompt), Query resolves the value \*ID to the number of the file selection, if not already used, or to the lowest possible value that is available in the range of Tnn, where nn is a number from 1 to 32.

Although file IDs are assigned to each file on the Specify File Selections display, you do not have to use them in other parts of the query definition unless you need to use a field that has the same name in more than one of the files in the query. You *must* use file IDs every time for identical field names, to ensure that the correct field is

used from the files. For all the other field names, (that is, those that occur in only one file in the query definition), you do *not* need to use the file IDs.

If you decide to change a file ID, Query keeps any definition values already assigned for field selection, sort field selection, and so on. (You must change the ID, if used, for join tests, result field expressions, record selection values, and break text.) However, if you *move* a file ID to a different selection group, all the definition values you specified are lost, even if all of the names in the from and to file selections are the same.

## Confirming Your Selections

When you are *creating* a query definition, you see a message that asks you to verify the values you just defined. This message appears when you press the Enter key after defining file selection values. You should verify your choices made thus far, then either continue selecting files or end the file selection process after confirming your choices. To end file selection, press the Enter key again.

When you are *changing* an existing query definition, you see a different message when you press the Enter key, and the values that you changed are shown in reverse image. Again, you should verify your changes and then press the Enter key a second time to actually have them changed in the definition. You do not have to press the Enter key twice if you make no changes or if you change only member names.

## Removing a Selection

Whether you are creating or changing a definition, if you decide you do not want to keep one of the files in the definition, you can remove it by blanking out the *File* prompt. When you press the Enter key, that file selection is removed.

By removing a file selection, you may cause an error elsewhere in your definition. This will occur if the file you removed was used in a join test or a field from a removed file was used to define a result field.

## Handling Errors on This Display

An error message is shown when you press the Enter key:

- If you did not type a file name
- If you typed a file name and left blank any of the *Library*, *Member*, or *Format* prompts for the file
- If there is a problem with one of the values you typed

The cursor is positioned to the blank prompt or the prompt in error, and the message describes the error for that prompt. For example, you may have typed the name of a file that you do not have the authority to use.

If there is more than one error, you will see the next one after you have corrected the first one.

## Selecting Files

The Select File display shows you a list of files from which you can select one or more files that your query is to get data from, or you can select one to receive the output from your query. This display appears if you position the cursor on the *File* prompt of the Specify File Selections display and then press F4 (List). (This display appears only when you are creating or changing a query definition.) The following is an example of how the Select File display might appear.

Select File

File ID . . . . . : T01

Library . . . . .	CUSTINV	Name, *LIBL, F4 for list
Subset . . . . .	_____	Name, generic*
Position to . . . . .	_____	Starting character(s)

Type option (and File), press Enter.  
1=Select

Opt	File
-	EXAMPFIL1
-	EXAMPFIL2
-	TESTFILE_A
-	TESTFILE_B
-	CUSTMAST_1
-	CUSTMAST_2
-	CUSTMAST_3
-	INVMAST

Bottom

F4=List      F11=Display text      F12=Previous

At the top of the display, a field named *File ID* may or may not appear. The *File ID* field is shown only if you came from the Specify File Selections display and pressed F4 (List) in a nonblank *File* prompt. If the file ID is shown, it is the file ID of the file selection group that the cursor was positioned to on the previous display.

If the *File* prompt was blank and you pressed F4 on the Specify File Selections display, the *File ID* field is not shown on this display, and you can then select *multiple* files here. If the *File* prompt had a partial name and you pressed F4 on the Specify File Selections display, the *File ID* field is shown as *Tnn* on this display, and you can select only *one* file.

If you came from the Define Data Base File Output display, you can select only one file on this display.

The list on this display includes all files (for which you have the needed authority) that are in the library shown at the top of the display. If you came from the Specify File Selections display, that library is the one indicated in the *Library* prompt below the *File* prompt in which the cursor was positioned when you pressed F4 for this list. If you specified a generic file name (in the form of ABC\*) as a file name on the Specify File Selections display, it is used as a subset value on this display, and only file names starting with those generic characters are included in the list. (You can specify another subset value on this display to change the subset shown.)

You can use the *Library* prompt to see the files that exist in a different library or group of libraries.

If you want to select a particular library from a list of libraries, press F4 with the cursor positioned in the *Library* prompt. The list that is shown contains only the libraries that you have the authority to use.

- If you press F4 when the prompt contains a library name, \*LIBL, or blanks, you see the libraries that are in the \*LIBL library list.
- If you press F4 when the prompt contains a generic library name or any of the other special library names, you see the group of libraries represented by that value.

If you do not want or need to see a list of libraries, type the name of a library, a generic library name (in the form of ABC\*), or one of the following special library names: \*CURLIB, \*LIBL, \*USRLIBL, \*ALLUSR, or \*ALL.

**Note:** If you type \*CURLIB and you do not have a current library, QGPL is used.

After you have entered a value in the *Library* prompt, press the Enter key, and a list of the files that you are authorized to use from that library appears.

If you typed in a generic library name or special library name, a *Library* column appears on the display so that you are able to determine in which library a particular file resides.

Opt	File	Library	Opt	File	Library
-	EXAMFILE1	CUSTINV	-	CUSTRELJAN	CUSTREL
-	EXAMFILE2	CUSTINV	-	CUSTRELFEB	CUSTREL
-	TESTFILE_A	CUSTINV	-	CUSTRELMAR	CUSTREL
-	TESTFILE_B	CUSTINV			
-	CUSTMAST_1	CUSTINV			
-	CUSTMAST_2	CUSTINV			
-	CUSTMAST_3	CUSTINV			
-	INVMAS	CUSTINV			
F4=List			Bottom		
F11=Display text			F12=Previous		
			F19=Next group		

You can also use the *Library* prompt in conjunction with a typed-in option number and file name to complete a file selection (unless the *Library* column is present). If a *Library* column is present, you can specify a library name, generic library name, or special library name in the *Library* prompt in conjunction with a typed-in option number and file name to complete a file selection. If you typed a generic name or special library name in the *Library* prompt, it will be resolved to the name of the first library (in the specified group of libraries) that contains a file with that name.

To see a smaller group of file names, move the cursor to the *Subset* prompt and type the starting characters followed by an asterisk (\*) to identify the group you want to see, and press the Enter key. All the files whose names begin with those characters in the specified library or library group are shown. (If no \* is used, only the file(s) with the specified name is shown.)

To return to the complete list of file names, blank out this prompt (or put an \* in it) and press the Enter key.

To move (position) the list of file names so that it starts with a particular name, move the cursor to the *Position to* prompt and type all of the characters or one or more of the starting characters in the name you want, and press the Enter key. (Do not add an \* after the starting characters in this prompt.) If a specific library name

is used in the *Library* prompt, Query moves the list so that the first position shown contains the first file name that starts with the characters you typed.

If there is no file name in the list that starts with those characters, Query moves the list to the name closest to, and in front of, the position where the name would have appeared. If a special library name or generic library name is used in the *Library* prompt, the list is repositioned only if the *Position to* prompt value exactly matches a complete file name.

Use F11 to alternate between showing a list of only file names to showing a list of both file names and text describing the files.

Once you have located the files you want, type a 1 beside each file name (if more than one is allowed), including the file name in the top position in the list. If you are selecting multiple files, you can select as many 32 files, *including* those previously selected for this query. Note that if join logical files are used, you are only able to select less than 32 files because each file used in the join logical file is counted as one of the 32 files. For example, if three physical files were joined into one join logical file, this join logical file is counted as three files, not one.

After you have made your file selections, press the Enter key to return to the Specify File Selections display. All the files you selected are added to the file selections, if any, that were there previously. (Any blanked out file selections are filled in first and new ones are added at the end as needed.) The files are added, each with its own group of file selection prompts, in the same order as they existed on the Select File display. They are also assigned file IDs to match the number of the file selection or, if that number is taken, to the lowest possible value that is available in the range of T01 through T32, which you can change if you wish.

---

## Selecting File Members

The Select Member display appears when you position the cursor on the *Member* prompt of the Specify File Selections display and press F4 (List). The Select Member display shows you a list of members from which you can select the one you want your query to get data from, or that you want to receive the output from your query. This display appears only when you are creating or changing a query definition.

Select Member

```

File ID . . . . . : T01
File . . . . . : EXAMPFILE1
Library . . . . . : CUSTINV

Type option (and Member), press Enter.
1=Select

Opt  Member
-  -----
-  EXAMPMBR1
-  EXAMPMBR2
-  EXAMPMBR3

Bottom

F11=Display text      F12=Previous

```

If you came from the Specify File Selections display, you can specify which member you want your query to get data from. If you came from the Define Data Base File Output display, you can specify which member you want the query data to be put into.

At the top of the display, the *File ID* field is shown if you came here from the Specify File Selections display. The file ID is the file identifier of the file that is shown in the *File* field. This file is the one for which you want to choose a member. The *Library* field shows the library in which the file is stored.

The names of the member that currently exist in the file shown at the top of the display are shown in the *Member* column. You can choose a member by either typing a 1 in the *Opt* column to the left of the member or by typing a member name (and a 1 in the *Opt* column next to it) in the first position in the list. If you specify a member name in the top position, that member must also exist at this time. If you specify \*FIRST or \*LAST, the member name on the previous display is changed to that value. Then, either the first or the last member that exists in the file at the time the query is run is the member that is used. If you came from the Define Data Base File Output display, you can also specify \*FILE in the first position in the list.

You can use F11 to alternate between showing a list of only member names to showing a list of both member names and text describing the members.

When you press the Enter key on the Select Member display, the member that you specify is then shown in the *Member* prompt on the display that you return to. If you return to the previous display without selecting or specifying a name, the previous member name or value is not changed.

## Selecting Record Formats

The Select Record Format display appears when you position the cursor on the *Format* prompt of the Specify File Selections display and press F4 (List). The Select Record Format display shows you a list of record formats from which you can select the one you want your query to use with a selected file member. This display appears only when you are creating or changing a definition.

Select Record Format

File ID . . . . . : T01  
File . . . . . : EXAMPFILE1  
Library . . . . . : CUSTINV

Type option (and Format), press Enter.  
1=Select

Opt	Format
-	EXAMPFMT1
-	EXAMPFMT2
-	EXAMPFMT3

Bottom

F11=Display text                  F12=Previous

At the top of the display, the *File ID* field shows the file ID of the file that appears in the *File* field. This file is the one for which you want to choose a record format. The *Library* field shows the library in which the file is stored.

The names of the record formats that you can select for the file shown at the top of the display are shown in the *Format* column. You can choose a record format by either typing a 1 in the *Opt* column to the left of the record format or by typing a record format name (and a 1 in the *Opt* column next to it) in the first position in the list.

If you specify a record format name in the top position, that record format must also exist at this time. If you specify \*FIRST, the format name on the previous display is changed to the actual name of the first record format in the file. It is possible that some record formats cannot be used with certain file members, but this is not determined until the Specify File Selections display is processed.

You can use F11 to alternate between showing a list of only record format names to showing a list of both record format names and text describing the record formats.

When you press the Enter key, you return to the Specify File Selections display, and the name of the format that you selected is shown in the *Format* prompt that you came from. If you return to the previous display without selecting or specifying a name, the previous record format name or value is not changed.



## Displaying All Files Selected

The Display File Selections display appears when you press F18 (Files) from a display where F18 is listed on the bottom of the display. The Display File Selections display shows all the files that you selected for use in the query. For each file, this display shows you the file ID, the library containing the file, and the file member and record format that are to be used. The information on this display is for your information only; it cannot be changed here.

Display File Selections				
ID	File	Library	Member	Record Format
T01	EXAMPFIL1	CUSTINV	*FIRST	EXAMPFIL1
T02	EXAMPFIL2	CUSTINV	*FIRST	EXAMPFIL2
Bottom				
Press Enter to show the join tests or F12 to show previous display.				
F12=Previous				

If multiple file selections are shown, you can press the Enter key to show the join type and all the join tests for these same files. However, if you came to this display from the Specify File Selections, Change File Selections, Specify Type of Join, or Specify How to Join display, the Enter key returns you to the previous display. (F12 and the Enter key (*not* F18) can be used to alternate between the Display Join Tests display and this display.)

---

## Joining Files

Once you have used the Specify File Selections display to select all the files that you want used for your query, if more than one file was selected, you must tell Query how you want to join the files when they are used to get data from their fields. You use two displays to specify all the join specifications for your query.

- The Specify Type of Join display shows you the types of joins you can use. There are three ways that you can join the files for selecting the records you want.
- The Specify How to Join display is shown so you can indicate what fields in those files are to be used to join the files. You specify which fields are to be used and how they are to be compared to fields in the other files.

For a record to be selected, the join specifications for *all* the files are used to determine whether a matching record exists in each of the files joined in the query. A match occurs when, for each joined file, the contents of its fields selected for comparison match the test condition(s) given on the Specify How to Join Files display. Depending on whether there is a match and which type of join is specified on this display, the records are then selected and used in the output as determined by the other *join specifications* given on the Specify How to Join Files display and the *record selection specifications* given on the Select Records display.

When Query determines that a record is to be selected from the joined files, then it uses the data in all the fields and files selected for use in the query to produce a single output record to be included in the query report or in an output data base file.

## Types of Joins

Specify Type of Join

Type choice, press Enter.

Type of join . . . . . 1

1=Matched records  
2=Matched records with primary file  
3=Unmatched records with primary file

F3=Exit            F5=Report            F12=Previous  
F13=Layout        F18=Files

There are three types of joins, or three ways that you can select matched or unmatched records from joined files. You can:

- Select only records that have matching records in *all* the joined files.
- Select *all* primary records, and include all matching secondary records. **Primary records** exist in the primary file. The **primary file** is the first file selected on the Specify File Selections display. **Secondary records** exist in secondary files. **Secondary files** are all of the files selected *after* the primary file on the Specify File Selections display.
- Select only the primary records that have one or more *unmatched* secondary records, and include all the secondary records that also match.

All three types use the same join fields and join tests specified on the Specify How to Join display, and they all use the other specifications in the query definition the same way to select records and produce the output.

Use the second join type (type 2) if you want to use every record in the primary file, whether or not it has a matching record in the secondary file(s).

Use the third join type (type 3) if you want to see which records in the primary file do not have matching records in the secondary file(s).

## How to Join Files

The Specify How to Join display is used to specify the join tests that are needed when more than one file has been selected for your query. Use this display to tell Query how to join (combine) the files and record formats by specifying pairs of fields with a test value; each test value indicates how those fields must compare before Query can select the record. The result of every test in the join specifications must be true before the matching records in each of the files are joined as one record for the record selection tests that follow.

Specify How to Join Files

Type field comparisons to show how file selections related, press Enter.  
Tests: EQ, NE, LE, GE, LT, and GT

Field	Test	Field

Bottom

Field	Field
A.NBR	B.NAME
A.NAME	B.PHONE
A.ADDR	B.SERIAL#
A.ZIP	
B.NBR	

Bottom

F3=Exit	F5=Report	F11=Display text
F12=Previous	F13=Layout	F18=Files

For each test, you specify two fields to be tested and the test value to be used. Look for a field in one file that contains the same (or similar) information that can be found in a field of the other file, such as a name or identification number. Specify the names of the fields (including their file identifiers, if needed) on either side of the test value.

For example, if you specify the EQ (equal) test value between two fields, the test result is true if both fields contain the same value. (The EQ value is almost always used.)

Field	Test	Field
A.NAME	EQ	B.NAME

In this example, both fields are named NAME, so the file identifiers (A and B) are included with the field names.

## Rules for Joining Files

The rules for join tests are:

- For two files to be selectively joined, they must have at least one field in common. (Note that having a field in common does not mean that the field names are the same.) This is also true for logical data base files, even though they may be based on fields with different names in the physical file over which the logical file is created.
- If you select option 2 (Matched records with primary file) or option 3 (Unmatched records with primary file) on the Specify Type of Join display, the length of the character fields used in the join test must be less than or equal to 120 characters.
- You can only use the EQ test value to join any of your selected files to a join logical file.
- Fields in each join test must come from different files.
- You can use more than one test for a given pair of files. If you specify option 2 or 3 (both using a primary file) in the *Type of join* prompt on the Specify Type of Join display, the test values must be the same for all the tests used in that pair of files.
- A field name must be preceded by a one- to three-character file identifier if that field name is used in more than one file selected for the query.
- The data in both fields in a join test must be the same type (both character or both numeric).

If some of the fields contain double-byte characters, you can use DBCS fields for both fields or you can use a character field for one field and an DBCS-either or DBCS-open field for the other field. DBCS fields are identified by a J, O, or E in the *Dec* column in the list of fields. Press F11 to see the *Dec* column if it is not currently shown.

Following are valid comparison for join tests:

- Character field with:
  - Character field
  - DBCS-either field
  - DBCS-open field
- DBCS-either field with:
  - Character field
  - DBCS-either field
  - DBCS-open field
  - DBCS-only field
- DBCS-open field with:
  - Character field
  - DBCS-either field
  - DBCS-open field
  - DBCS-only field
- DBCS-only field with:
  - DBCS-either field
  - DBCS-open field
  - DBCS-only field
- Numeric field with numeric field

Only the data fields specified in the join specifications for each file are used to join the files; for the purposes of joining the files, the other fields in the files are ignored.

If you specified option 1, matched records, on the Specify Type of Join display, you can type \*ALL in the first four spaces of the left field, but only in the first field name position, rather than specifying any join test. If \*ALL is used, each record in the first file is joined to *every* record in the other files. For example, if a file of 2000 records is joined to a file of 3000 records using \*ALL, the result is a joined file of 6,000,000 records. Using \*ALL can significantly degrade the performance of your query.

Note that the fields you use to join the files do *not* have to be, for example, used in selecting the records or included in the query report. You can use those same fields in other ways in the query definition, such as for record selection or as part of the output of the query.

## Examples of Joining Files

Consider an example where you want to join a master name and address file named RESIDENTS to a name and telephone number file name PHONELIST.

RESIDENTS File (File A)

NBR	NAME	ADDR
1	Ruth A Anderson	226 W 2nd St
2	Jane L Johnson	123 Park Dr
3	Susan M Jones	Box 333 Rt 1
4	Richard A Klein	978 N 9th Av
5	James A Kryka	421 S 1st Av
6	Sam K Smith	16 N Broadway

PHONELIST File (File B)

NBR	NAME	PHONE
1	Ruth A Anderson	744-1017
3	Susan M Jones	327-1234
4	Richard A Klein	744-9922
4	Richard A Klein	744-9988
5	James A Kryka	327-1547

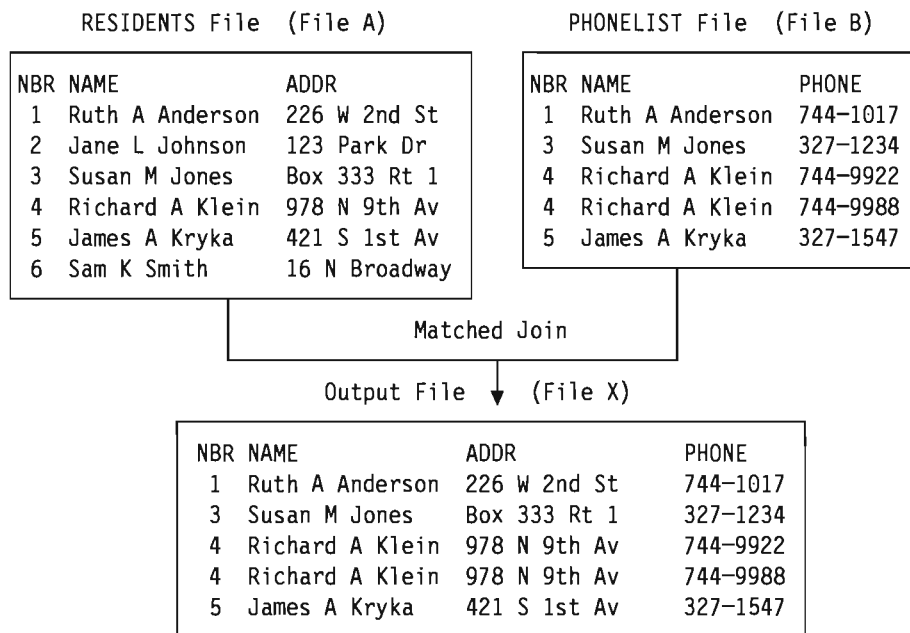
You can obtain several different results from a file join by using different combinations of join tests and options on the Specify How to Join display.

Following are some examples of how you might use the three different types of joins. All of the examples assume that A.NAME EQ B.NAME was specified on the How to Join display.

## Selecting Matched Records from All Selected Files

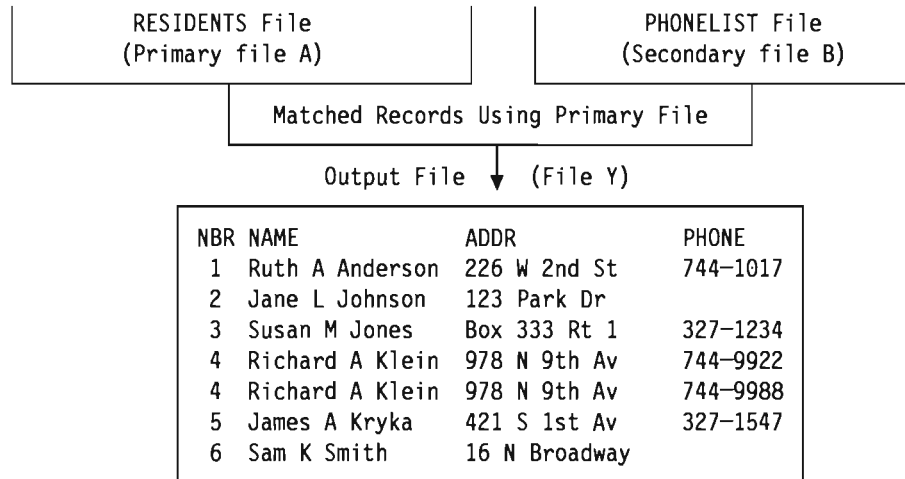
Type a 1 if you want records selected from each file only if they have a match with at least one record in each and every one of the other selected files. That is, for a record to be selected, *all* the files must have a matching record as determined by the join specification(s). A match occurs when, for each file used in the query, the contents of its fields selected for comparison match the test condition(s) given on the Specify How to Join Files display. (This type, option 1, has no primary or secondary files; all files are treated equally.)

In our example, if we join files A and B using option 1 (Matched records), the query report would contain the following records. (The report fields and layout are not important here.)



## Selecting Matched Records Using a Primary File

Type a 2 if you want to include in the query output *every* record in the primary file and all the matching records from all the other (secondary) files, whenever they exist. Every record in the primary file is selected whether or not it has a match. (The primary file is always the one that was selected first in your query definition.)



In our example, the RESIDENTS file is the primary file, so all of its records (numbered 1 through 6) are included in the query report. The PHONELIST file is the only secondary file being used, and it supplies a telephone number for each primary record that it matches; the NAME field is used as the comparison test field in both files. Note also that record 4 is included twice in the report, because Richard A Klein has two records, each with a different telephone number, in the secondary file.

If a secondary file does not have a record that matches the join specifications of the primary file's record, blanks (for character fields) or zeros (for numeric fields) are used as the data for that secondary file's selected fields. If those fields are also included as output fields in the query report, the blanks and zeros are used in the report instead of the data that would have been supplied if a matching record had been in the secondary file. (In our example, the PHONE field shows blanks, since it was coded as a character field.)

However, if the secondary file was defined using DDS, values other than blanks and zeros can be used if the DFT keyword in DDS is used to define default values for any of its fields. If the DFT keyword was used to specify a default value for a field that is used in the query report, then the default value is substituted in the report whenever that secondary file does not have a matching record.

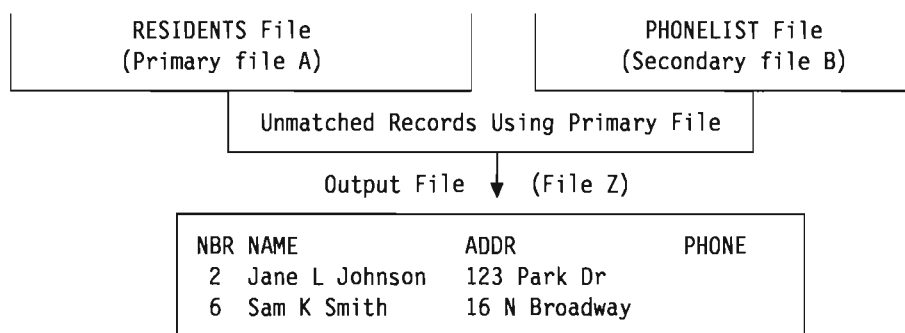
If the DFT values are defined as something like 9999.99 for a numeric field or NO RECORD FOUND for a character field, it should be easy to pick out which secondary file has missing records and which records are actually missing. (In our example, NO PHONE would have fit as the default value for the PHONE field.) For more information about the DFT keyword, see the *DDS Reference*.



## Selecting Unmatched Primary File Records

Type a 3 if you want to select, in the primary file, only records that lack matches in at least one secondary file. That is, you want to select every primary record that does not have a matching record in *all* the secondary files. For example, if four files were joined and only two of the three secondary files had matching records, then a record containing the selected information in the primary and two matching secondary files (and the default data, if any, from the unmatched secondary file) is included as a single record in the query output.

This type of join is typically used to list records that are missing in one or more secondary files.



In our example, the RESIDENTS file is still the primary file, so only its records that do not have a matching secondary record are included in the query report. The PHONELIST file has two such unmatched records; the residents identified in records 2 and 6 do not have a telephone number, so there are no records for them in the secondary file. (The NAME field is used again as the comparison test field in both files.)

As with the previous type of join, blanks (for character fields) or zeros (for numeric fields) are used as the data for a missing record in a secondary file's selected fields. Or, if the DDS DFT keyword was used to define default values, those default values are used instead. (In our example, the PHONE field shows blanks, since it was coded as a character field and no DFT value was defined for the PHONE field.)

## Sequencing Secondary Files for a Primary Join

The order in which you specify secondary files on the Specify File Selections display is important for some joins.

Specifically, the order of secondary files is important if *all* of the following are true:

- The join type is 2 (primary matched) or 3 (primary unmatched). Both types have one primary file, followed by secondary files.
- The query specifies three or more files in all.
- One or more secondary files do not have join tests connecting them to the primary file.

If these points apply to your query, then follow the secondary file sequence rule:

Use join tests to connect each secondary file to a file listed above it on the Specify File Selections display.

For instance, when joining four files, use a join test to connect the second file to the first, and use another test to join the third file to the first or second file. The fourth file can be connected to any of the other files.

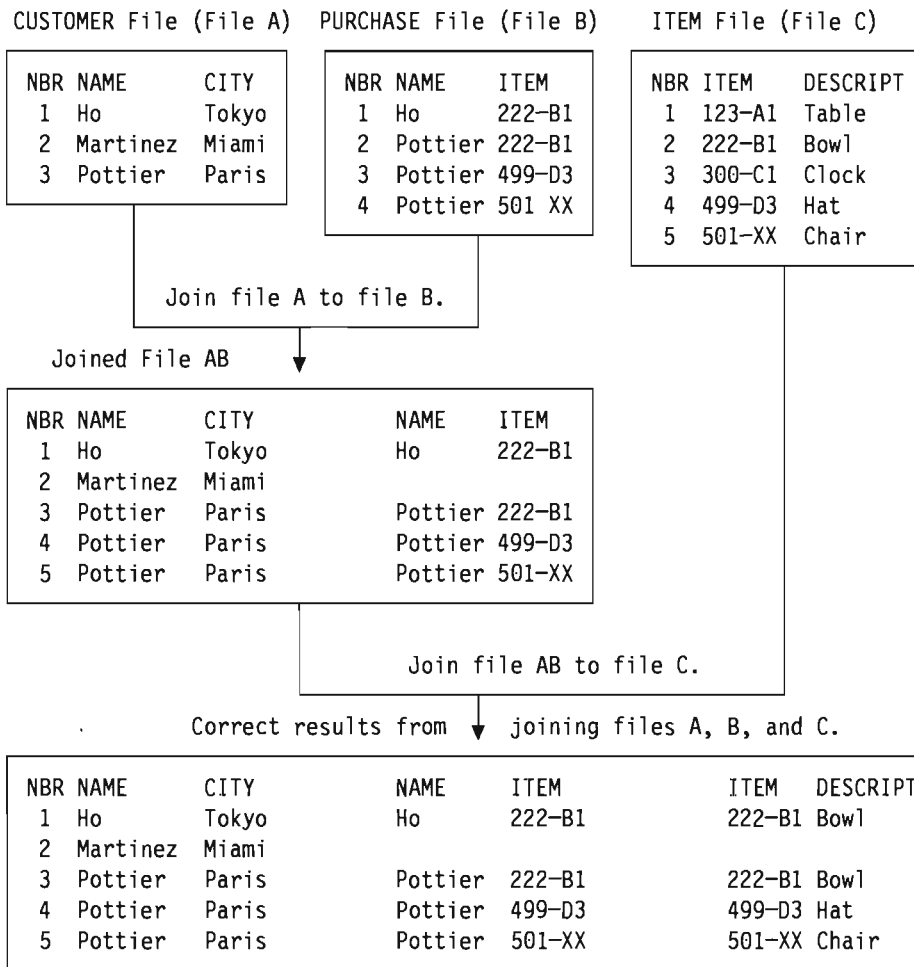
### Example of Sequencing Secondary Files

To show how the secondary file sequence rule ensures that you get the desired results when you join more than two files, the following example uses three files in two ways, correctly and incorrectly. The first method, the correct method, produces *five* records when the files are joined. The incorrect method produces 15 records. The only difference between the methods is that the order of the second and third files is changed. For primary joins, Query joins files in the order indicated on the Specify File Selections display, not in the order indicated by the join tests.

Three files named CUSTOMER, PURCHASE, and ITEM are to be joined so that a report can be produced that lists each customer's name and city, the item purchased (one item per line in the report), and a description of the item. (For example, if Monique Pottier bought three items, the report should have three lines for her, with each line listing her name, city, one item, and the item description.) If the customer did not make any purchases, the report should include the customer once in the list with blank item and description fields.

**Correct Method:** On the Specify File Selections display, type the CUSTOMER file first, the PURCHASE file second, and the ITEM file third. Specify the file IDs A, B, and C, respectively. The join type is 2 (Matched records with primary file). The join tests are:

A.NAME	EQ	B.NAME
B.ITEM	EQ	C.ITEM



Query performs the file join in two steps:

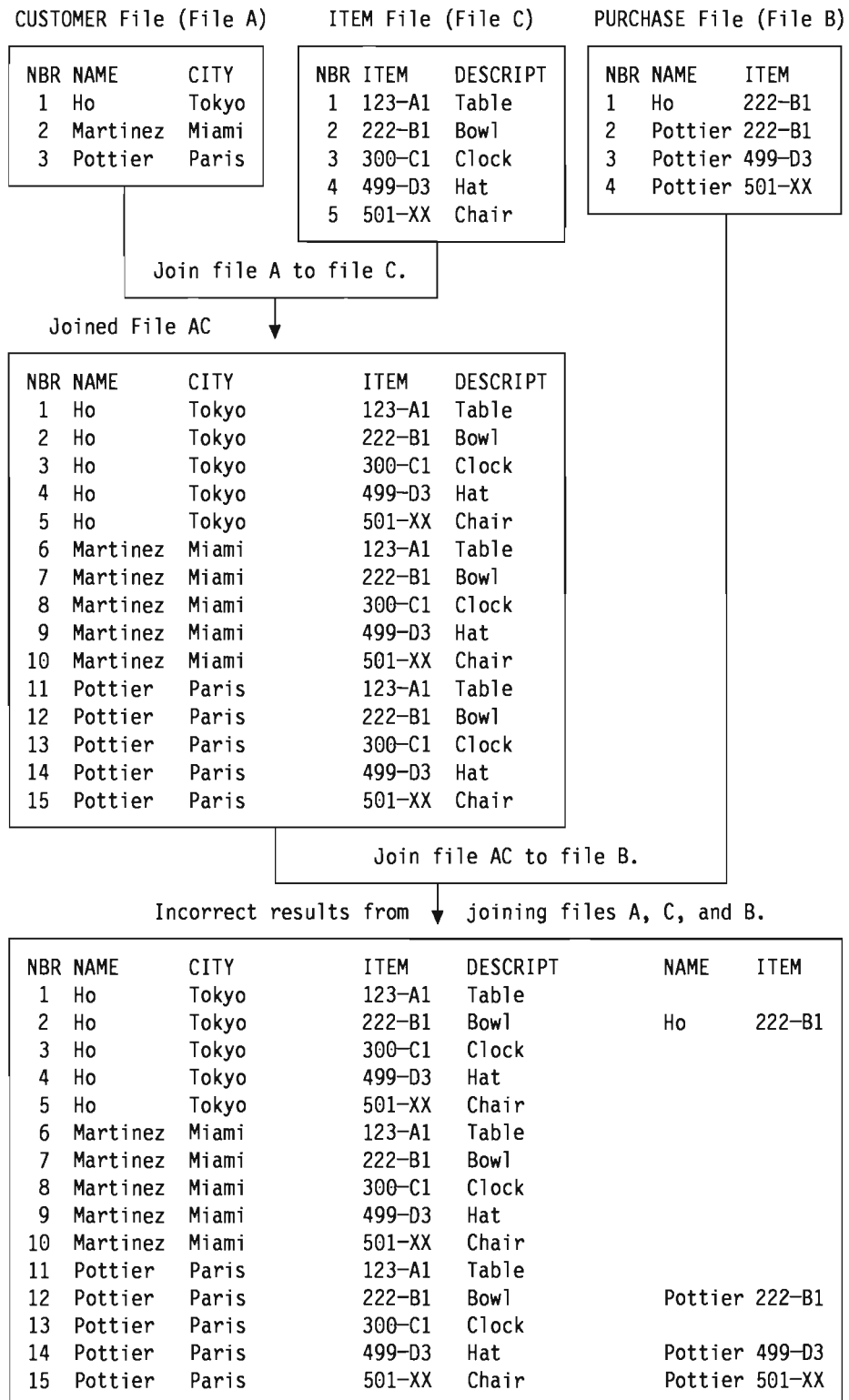
Step 1: Join the first two files, A and B.

Query joins the files in the order listed, starting with file A (CUSTOMER), and file B (PURCHASE). Query joins each record in file A to any record in file B for which the NAME field in A is equal to the NAME field in B. Because this query is join type 2 (primary matched), every record in the primary file A is included in the join. If a record in file A (such as Martinez) has no match in B, Query joins it to a default record for file B, which has blank values for fields. The result of step 1 in our example is a file called AB. (Note that AB is a working file used to build the joined file that you want in your report. You cannot see file AB.)

Step 2: Join file AB to file C.

Query joins each record in file AB to every record in ITEM file C for which B.ITEM equals C.ITEM. If a record in AB (such as Martinez) has no match in file C, Query joins it to a default record for file C, which is also blank. This completes the join operation. Each record in primary file A is represented one or more times in the five records.

**Incorrect Method:** On the Specify File Selections display, type the CUSTOMER file first, and specify the file ID as A. Type the ITEM file second (file C), and the PURCHASE file third (file B), which is in the opposite order from the correct method. Note that each file has the same file ID as before. Specify the join type and join tests the same as before. This method does not follow the secondary file sequence rule because file C is not connected by a join test to the file (A) listed above it.



Query performs the file join in two steps:

Step 1: Join the first two files, A and C.

Query joins the files in the order listed, starting with file A (CUSTOMER), and file C (ITEM). But there is no join test that compares a field in A to a field in C. Query joins every record in file A (one record at a time) to *every* record in file C. Because there are three records in A and five records in C, the result is 15 records. The join tests are not used in this step. The result of step 1 this time is a working file called AC.

Step 2: Join file AC to file B.

Query joins each record in file AC to every record in PURCHASE file B for which A.NAME equals B.NAME and B.ITEM equals C.ITEM. If a record in AC (such as Martinez) has no match in B, Query joins it to a default record for file B, which is blank. This completes the join operation.

The incorrect method produces 15 records, which is 10 too many. Each customer has five records, one for each item description, even if the customer made no purchases. Note that if the ITEM file has 1000 records instead of five, the correct method still selects five records, but the incorrect method selects 3000 records. Also, the ITEM and DESCRIPT values for Martinez are not blank as they should be.

In summary, this problem does not affect queries with join type 1 (matched), queries with just two files, or queries that use the primary file in each join test. In this example, the logical order to specify files is CUSTOMER, PURCHASE, and ITEM, with PURCHASE in the middle because it is the connection between the CUSTOMER and ITEM files. This logical order is also the correct order.

# Displaying All Join Tests

When you press the Enter key on the Display File Selections display (see “Displaying All Files Selected” on page 4-11), the Display Join Tests display is shown. The information on this display is for your information only; none of the entries can be changed here. (The following display shows some sample information.)

Display Join Tests

Type of join . . . . . : Matched Records

Field	Test	Field
A.NAME	EQ	B.NAME

Bottom

Press Enter to continue.

F12=Previous

The Display Join Tests display shows:

- The type of join being used to join all the files in the query. One of three join types can be specified:
  - Matched records
  - Matched records with primary file
  - Unmatched records with primary file

The primary file, used in the last two types, is the first file listed on the Display File Selections display. For more information, press F11 (Search index), type *joining files* as the index search words, then press the Enter key.

- The join tests being used to join the files.

The *Field* columns show the fields being used to join the files. Each field name can have two parts: the file ID and the actual name of the field, separated by a period. For example, if a field named CUSTNUM exists in files T01 and T02 used in this query, they would be shown as T01.CUSTNUM and T02.CUSTNUM. To find the files associated with the file IDs (such as T01), press F12 to show the Display File Selections display.

The *Test* column shows the test values that determine how the files are to be joined.

## If Fields Are Missing

The Fields Missing from File Definition display is shown when report fields (that is, fields used in the report) that were in a file selection used by the query are now missing from that file selection. Fields that are missing from files originally selected in a query can cause errors or give you bad results when the query is run. They may have been used, for example, to define result fields or to select or sort records in addition to being selected for output.

Fields Missing from File Definition

Query . . . . .	QRY1	Option . . . . .	Change
Library. . . . .	LIB1		
File . . . . .	FILEA		
Library. . . . .	LIBA		
Format . . . . .	FMT1		
File ID . . . . .	T01		

The following fields may have been used in the query, and were expected in this file definition, but were not found.

Field  
NAME  
ADDR  
PHONE  
SERIAL#

Press Enter to continue recovery of the query definition.

F12=Previous

This display is shown at least once for each file selection that has missing fields. Once you are aware that fields are missing, you may want to press F12 to bypass seeing any additional displays of missing fields. Or, if you want to see which of the other file selections may have missing fields, use the Enter key to see each display, one after the other. (You might also want to return to a previous display and use F5 (Report) to run the query and see how the report is affected by the missing fields.)

Either you must remove the fields from wherever they are used in the query definition, or you must select different files or formats that contain those fields. Or, you can leave Query and check the files or formats themselves. If this display appeared when you first started to change or display a query, something may have changed in them since the query was created or last changed. For example, a format definition may have had one or more of its fields deleted, or an IDDU-defined file may have been linked to a dictionary definition but is now unlinked or is linked to a different definition.

The situations that can cause this display to appear are:

- When you specify a different file selection. This can occur while you are changing a query or are defining a *new* query that already has file selections specified.
- When you *start* to change or display an existing query definition.

## During File Selection Process

While you were changing a query, or were defining a new query that already had file selections specified, you chose the *Specify file selections* option on the Define the Query display. Then, on the Specify File Selections display, you selected a file or format that does not have all of the report fields that your first selection contained. As a result, this display was shown with the missing fields.

For this situation, when you press F12 or the Enter key, you return to the Specify File Selections display without affecting your previous file (and format) selections. Once there: you can still confirm the file selections and continue by pressing the Enter key (even though Query found fields missing in the current file selections); you can specify a different file on the display and then press Enter; or you can press F12 to leave the file selections unchanged and then leave Query to go do something about the file (or format) definitions.

If you choose to press the Enter key as soon as you return to the Specify File Selections display, confirming that you want to use the current file selections, Query uses as much of the file, format, and field information as it can for the file selections now in this query. It removes all the missing fields from the query definition for *some* of the definition steps, such as the *Select and sequence fields* and *Select sort fields* steps. After Query has done all it can, it shows the Specify How to Join Files display if the query uses multiple files and there are errors caused by missing fields; otherwise, it continues with the definition steps selected on the Define the Query display, or it returns you to the Define the Query display. On the Define the Query display, any other field-related definition steps affected by the missing fields are shown in reverse image. You must select each of these definition steps, such as *Define result fields* and *Select records*, and correct the problems caused by the missing fields. On the definition displays for the affected steps, the expressions or selection tests that use fields that are now missing are highlighted.

## When Starting to Change or Display a Query

When you *started to change or display* an existing query (by specifying option 2 or 5 on the Work with Queries display), one of the following occurred:

- Query determined that one or more report fields are no longer in a file or format used by the query; the fields have been removed since the query was defined or was last changed.
- Query found a file that was unusable (for example, the query may have been migrated from another system but a file containing the fields was not) and showed the Change File Selections display. On that display, you selected a different file to correct that problem, but its record format does not have all of the fields that your first selection contained.



For these two situations, when the Fields Missing from File Definition display is shown, you can either press F12 or press the Enter key:

- If you choose to press the Enter key, you might see the Fields Missing from File Definition display again if there are additional missing fields to be displayed for this or another file. If not, Query uses as much of the file, format, and field information as it can for the file selections now in this query. It removes all the missing fields from the query definition for *some* of the definition steps, such as the *Select and sequence fields* and *Select sort fields* steps. After Query has done all it can, it shows the Define the Query display. On it, other field-related definition steps affected by the missing fields are shown in reverse image. You must select each of these definition steps, such as *Specify file selections*, *Define result fields*, and *Select records*, and correct the problems caused by the missing fields. You must also ensure that none of the fields were used in break test values on the Format Report Break display. On the definition displays for the affected steps, the expressions or selection tests that use fields that are now missing are highlighted.
- If you press F12, you return to the Work with Queries display without affecting your previous file (and field) selections. You can press the Enter key to go again (assuming you were there once) to the Change File Selections display and select another file. Or, you can press F3 to stop working with queries, leave Query, and then go do something about the files or formats.






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## Chapter 5. Defining Result Fields

This chapter describes how you define numeric and character result fields. They need to be defined in your query if the information that you want to present in your report does not exist as a field in your selected file(s). For example, you want your report to show the number of days, but your data base file only has a field containing the number of weeks. You can define a result field that will contain the number of days by creating an expression that performs a calculation on the number of weeks.

After you have defined a result field, you can use it like any other field that exists in your selected file(s). You can include the result field in your output; you can use it to define another result field; you can use it as a sort field; and so on.




While you are defining result fields, a list in the lower part of the display assists you by showing the names of fields in the files selected for your query. If you want to see additional information about each field such as descriptive text, length, and decimal positions, use F11 (Display text) to switch between the multiple-column list and the single-column list. This information is very useful when you are deciding on a result field name and when you are building your expressions. The roll keys will present all the fields available, four at a time. For more information on using F11, see “Using F11 to Display Additional Information” on page 2-11.



In most cases, the result fields that you define will appear in your query output, but selecting them for output is optional since some result fields are only needed as an intermediate step to obtain a final result. For example, you might define a result field only for the purpose of selecting records, and you do not want the result field to appear on the report.

---

### Creating Results Fields



The Define Result Fields display appears if you typed a 1 next to the *Define result fields* option on the Define the Query display. You use the Define Result Fields display to create the result fields that you need for your query. (The following display has some sample fields listed in the bottom part.)

**Define Result Fields**

Type definitions using field names or constants and operators, press Enter.  
Operators: +, -, \*, /, SUBSTR, ||

Field	Expression	Column Heading	Len	Dec
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Bottom				

Field	Field	Field	Field
ACCTNUMBER	STREETADDR	TELENUMBER	DATELASTPD
LASTNAME	CITY	CRLIMIT	
INIT	STATE	BALDUE	
COMPANY	ZIPCODE	PASTDUE	
Bottom			

F3=Exit	F5=Report	F9=Insert	F11=Display text
F12=Previous	F13=Layout	F18=Files	F20=Reorganize

To define a result field, you specify a unique name for the result field by entering a name in the *Field* column on the **Define Result Fields** display. You *cannot* specify the name of a field that exists in your selected file(s)—the list in the lower part of the display shows you these field names. To page through the field list, position the cursor in the list part of the display and use the roll keys. (A one-word indicator always appears below and to the right of the list to tell you where you are in the list. *More...* means that there are more items after, and possibly before, the items currently shown. *Bottom* means that you are at the end of the list; there may be more items before those currently shown.) Use F19 (Next group) to reposition the list at the beginning of the next logical group of fields (the cursor can be anywhere when you use F19). (The first group is selected fields, if any, and the second group is sort fields, if any. If there are not selected fields, then the fields are grouped by file, and within each file grouping, the fields are listed in the order in which they appear in the file definition.)

The next step involves entering an expression that will create the desired value for your result field.

You can also specify the length and number of decimal positions for a numeric result field, or Query can determine the result field's length and decimal positions for you.

You will also have the opportunity to tailor the column heading if the result field is to appear on your report.

## Result Field Name

Since Query result field names are similar to data base field names, create them according to the following:

- Start the name with an alphabetic character (A through Z, \$, #, or @) and use no more than 9 alphanumeric characters (A through Z, 0 through 9, \$, #, @, or \_) for the remaining characters. Do not use blanks within the name.
- Do not use any names from the list on the lower part of the display or the names of other result fields.

## Expressions

An expression can be either a numeric expression or a character expression:

- A **numeric expression** performs an operation (calculation) on or an assignment of numbers. Numeric expressions may contain the following operators:

+ (Addition)

– (Subtraction)

\* (Multiplication)

/ (Division)

- A **character expression** performs an operation on or an assignment of characters. Character expressions may contain the following operators:

|| (Concatenation)

SUBSTR (Substring)

## Numeric Expressions

To define a numeric result field (that is, a result field that contains numbers) for your query, you need to follow the rules for creating numeric expressions. A numeric expression for a result field can contain the following, alone or in combination:

- **Numeric field names** (names of fields that contain numbers). You can use the names of numeric fields listed on the lower part of the display (numeric fields have numbers shown in the *Len* and *Dec* columns) and the names of previously defined numeric result fields. For example, you can multiply two numeric fields and put the total in a result field named AMOUNT:

AMOUNT = QUANTITY \* PRICE

- **Numeric constants** (any numbers such as 4 or –12.5). The rules for using numeric constants are:
  - The total length can be no more than 31 digits. (For a single-precision floating-point constant, the total length can be no more than nine digits. For a double-precision floating-point constant, the total length can be no more than 17 digits.) This includes the digits both to the left and right of the decimal point but does not include the decimal point. All the digits can be to the right of the decimal point.
  - Do not use a currency symbol (like \$5000), and do not use thousands separators (like 5,000).
  - Place a negative sign directly in front of the leftmost digit, with no space between the sign and the digit. For example, type: –5000, not – 5000.

Other examples of numeric expressions for a field named AMOUNT are:

QUANTITY  
5  
5 + 6  
5 + QUANTITY

When you do more than one calculation within a numeric expression, use parentheses to tell Query in what order to do the calculations and to make the expression easier to understand. If you use nested parentheses (for example, 60 \* (A – (B + C))), the calculations are done for the innermost pair first (in the example, B + C), then the next innermost pair, and so on. If you do not use parentheses, Query first

does multiplication and division, left to right, and then addition and subtraction, left to right. For example,  $(5 + 4) * 2$  equals 18, but  $5 + 4 * 2$  equals 13.

Be aware that the result of a numeric expression, especially one containing division and multiplication operations, is truncated or rounded depending on what you specify on the Specify Processing Options display (see Chapter 14, “Specifying Processing Options”). If you divide by zero, your query may not run.

## Character Expressions

To define a character result field (that is, a result field that contains alphanumeric characters) for your query, you need to follow the rules for creating character expressions. A character expression for a result field can contain the following, alone or in combination:

- **Character field names** (names of fields that contain alphanumeric characters). You can use the names of character or DBCS fields listed on the lower part of the display (in the *Dec* column, character fields have blanks, DBCS-only fields have J's, DBCS-open fields have O's, and DBCS-either fields have E's) and the names of previously defined character result fields.
- **Character constants** (alphanumeric characters or DBCS characters enclosed in apostrophes, such as 'ABCdef123' or 'This text includes blanks and special characters \*\*\$\$'). The rules for using character constants are:
  - The character constant must be enclosed in apostrophes.
  - If two apostrophes are used *within* a character string, the two apostrophes become a single apostrophe in the output. For example, 'October''s Profits' becomes October's Profits.

Character expressions can include one or more substring or concatenation operations.

- Substring operations must be specified in the form:  
SUBSTR(Value,Offset,Length)
  - *Value* is the name of a character field (including result fields that are already defined), a character expression, or a character constant. It can be a DBCS character field, a DBCS-open character constant, or a DBCS-only character constant.
  - *Offset* is the starting character position within the field or character constant.
  - *Length* is the number of characters that make up the substring. You do not need to specify a length; if you do not, the resulting substring is the entire field or character constant from the value you specify for *Offset* to the end.

For example, if a character field named ALPHA containing the value 'ABCDEFGHI' is used in SUBSTR(ALPHA,4,3), the resulting substring is 'DEF'.

If you did not specify a value for *Length*, the resulting substring is 'DEFGHI'.

- You must use commas between the substring elements, and blanks are allowed.
- If the *Offset* and *Length* values cause the substring to exceed the right end of the field, you will receive an error message.
- Concatenation operations must be specified in the form:

Value-1 || Value-2

- *Value-1* and *Value-2* are the character fields or character constants that are to be concatenated. You can use character field names (including character result fields), character constants (including DBCS-open and DBCS-only), and DBCS character fields.
- Two logical OR symbols (||) make up the concatenation operator used to join the two values.

For example, if a character constant 'Dr. ' and a character field named LASTNAME containing the value 'Smith' were concatenated, the result would be 'Dr. Smith'.

Other examples of character expressions are:

```
NAME
'Mr.'
'Mr.' || NAME
FIRSTINIT || MIDINIT
```

## General Considerations When Creating an Expression

Following are some general rules you should use when you are creating expressions:

- Your expression can have a single value, or it can use as many operands and operators as you need that will fit in the three lines provided on the Define Result Fields display.
- On the three lines provided, you can split a field name, numeric constant, or character string at the end of one line and continue it at the beginning of the next. Character constants (that is, characters enclosed in apostrophes) can be split at any point. However, when you split a field name or a numeric constant, do *not* put spaces at the end of the first line or at the beginning of the next line because Query then treats it as *two* field names or constants.
- To make your expressions easier to read, you can use blanks between field names and operators.
- You can create up to 100 result fields.

Query will decide if the result field is a numeric field or a character field according to the following:

- If the first value in the expression is a numeric field name or a numeric constant (like the number 7 or -3.14), then the result field is numeric.
- If the result field is set to DBCS-open, then the result field is DBCS-open.
- If the result field is set to DBCS-only, then the result field is DBCS-only.
- If the result field is set to DBCS-either, then the result field is DBCS-either.
- If the concatenation operation is used and any one of the values being concatenated is DBCS, the result field is DBCS-open.
- If the concatenation operation is used and all of the values being concatenated are DBCS-only, the result field is DBCS-only.
- If the SUBSTR operation is used, the result field is a character field.
- If neither of the first seven conditions are met, then the result field is a character field.

## Column Headings

If you want to specify a column heading to be used for a result field, type the heading you want on the three lines (up to 20 characters each) of the display that correspond to your result field. The heading will appear in your query output exactly as you enter it on the three lines. If you do not want any heading for a result field, type \*NONE in the first five positions on the first line for that field. (You must use all capital letters, and the rest of the line and the next two lines must be blank.) If you do not specify a heading, Query uses the result field name as the column heading.

## Length and Decimal Positions

If you do not specify anything in the *Len* and *Dec* columns when you define a result field, Query determines the length for each result field you define. If you want to know what that value is, press F13 to see the layout of the report and count the number of 9s (numeric fields) or Xs (character fields) in the result field. You will have fewer things to keep track of when you make changes to the expressions in the future if you let Query determine these values.

If you are creating result fields by using multiplication and division operations, you *may* be able to reduce the length value if the actual data in your files will not require the maximum field size as established by Query. For example, an inventory master file would typically have a PRICE field and a QUANTITY field. Both fields would have to have sufficient length to handle the largest value possible. When these two fields are multiplied to create a result field called AMOUNT, the maximum length would be the sum of the sizes of both fields. Since items with high prices are usually stocked in low quantities, the maximum field size for AMOUNT would probably be too large for practical use (for example, in a report).

**Note:** If you want to decrease the field length because you only want a certain number of positions shown on a report, you should not change the field length on the Define Result Fields display and instead change the field length on the Specify Report Column Formatting display. If you specify a field length on the Define Result Fields display, the result of a numeric expression may be truncated or rounded, depending on what you specify on the Specify Processing Options display.

For character result fields, you must leave *Len* and *Dec* blank.

For numeric result fields, length is the total number of digits in the field. It includes the number of digits to the left and right of the decimal point, but not the decimal point itself. If you want to type your own value for the length, to prevent unexpected results, you should first read "Length and Decimal Positions" on page 10-2.

- If you specify a value for *Len*, you must also specify a value for *Dec* (decimal positions).
- If you increase or decrease the value in *Dec*, you should increase or decrease the value in *Len* the same amount. Also, you may need to change these values later if you make changes to the numeric expression.
- If you leave *Len* and *Dec* blank, Query changes the value if the expression changes.

Decimal is the number of decimal positions to the right of the decimal point in numeric result fields.



## Example of Defining a Result Field

An example of how you would create a numeric result field called DAYS using the expression WEEKS \* 7 and using the report column heading Total Days is shown on the following display. The second input area shows how you would define a character result field called GREETING with a value of 'Have a nice day' and no column heading.

Define Result Fields

Type definitions using field names or constants and operators, press Enter.  
Operators: +, -, \*, /, SUBSTR, ||

Field	Expression	Column Heading	Len	Dec
DAYS	WEEKS * 7	Total Days	_____	__
GREETING	'Have a nice day'	*NONE	_____	__

Bottom

Field  
MONTHS  
WEEKS  
YEAR

Bottom

F3=Exit      F5=Report      F9=Insert      F11=Display text  
F12=Previous    F13=Layout      F18=Files      F20=Reorganize

## Adding or Deleting Result Fields

Adding a result field to your query definition requires positioning the cursor to the top half of the display and using F9 to insert a blank set of result field definition lines. After you have entered the information necessary to define your new result field or fields, they are inserted after the set where the cursor was positioned when you pressed F9. Note that a result field must be defined before it can be used as part of an expression to create another result field.

Once you have positioned the cursor in the top half of the display, the roll up key will continue to show you the next two field definitions until you reach the last non-blank definition in the list. Roll down will show you the previous two definitions until you reach the beginning of the list.

To delete a result field, blank out all references to the field and its definition on the Define Result Fields display. You have the responsibility to remove all other occurrences of it from your query, but don't worry—Query will lead you to any occurrence of that result field in other expressions or in other parts of the query definition.



## Chapter 6. Selecting and Sequencing Fields

This chapter describes how you select fields that you want to include in your query output and how you indicate in what sequence the fields are to appear. They appear in a query report from left to right based on the sequence number that you enter for each field. Query gives you the opportunity to select fields from all your selected files and from all the result fields defined in your query.

### Letting Query Select and Sequence Fields

If you did not type a 1 next to the *Select and sequence fields* option on the Define the Query display, Query selects and sequences up to the first 500 fields available in your query. If the file(s) you have selected contains only a few small fields that would all easily fit in 132 positions (the standard width of printed output) and you do not care about the sequence of the output, letting Query select and sequence fields for you makes good sense and may save you some time.

The Select and Sequence Fields display is shown during query definition if you typed a 1 next to the *Select and sequence fields* option on the Define the Query display. You can press F12 (Previous) to return you to the previous display if you have changed your mind and now want Query to select and sequence fields for you. (Anything you typed on the display will be ignored.)

### Selecting Fields and Specifying Their Sequence

The Select and Sequence Fields display is shown below with some sample fields from a customer master file shown in the *Field* column.

Select and Sequence Fields

Type sequence number (0-9999) for the name of each field to appear in the report, press Enter.

Seq	Field	Seq	Field
___	ACCTNUMBER	___	PASTDUE
___	COMPANY	___	DATELASTPD
___	FIRSTNAME	___	CURRENTDAT
___	MIDDLEINIT	___	YEAR
___	LASTNAME	___	MONTH
___	STREETADDR		
___	CITY		
___	STATE		
___	ZIPCODE		
___	TELENUMBER		
___	CRLIMIT		
___	BALDUE		

Bottom

F3=Exit  
F13=Layout

F5=Report  
F18=Files

F11=Display text  
F20=Renumber

F12=Previous  
F21=Select all

You make your selections by specifying a sequence number from 0 through 9999 in front of each field you want to select. Use the numbers in ascending sequence. The lowest numbered field will be positioned on the far left of your output (or be the first field in your data base file). If you change your mind about the fields you have

selected, you can delete a field from the output by removing the number you specified in front of it. To change the sequence of the selected fields, just change the numbers.

After making new selections or changing old ones, press the Enter key to rearrange them on the display in the new sequence. You can then renumber them with new sequence numbers in increments of 10 (10, 20, 30, and so on) by pressing F20. Renumbering can make it easier to add a field within the sequence later.

Only those fields that you have selected so far will appear in your output. If you want the remaining fields (those with no numbers to the left of them) to appear in your output and you do not particularly care how they are arranged, press F21 (Select all). Query will arrange the list beginning with those fields that you already selected, and then it supplies sequence numbers for all of the remaining fields in the order that they appeared in the list. (F21 is available only if you are creating or changing a query definition.)

When you make selections or change the sequence and press the Enter key, Query rearranges the fields to match the sequence you specified and displays the message "Press Enter to confirm." If you are satisfied with the selections and sequence, press the Enter key again to end field selection. If you make any changes before you press the Enter key, the message is shown again, and you must press the Enter key once more to continue.

The fields are shown on the display in the following order:

1. All fields selected on this display, in the sequence specified. If no fields are selected, the fields chosen as sort fields (if any) for this query are listed first, in the order they were given priority on the Select Sort Fields display. (See Chapter 8, "Selecting Sort Fields.")
2. Any result fields that have been defined for this query but have not been selected.
3. All other fields not selected, in the order they exist in the record format definitions for the selected files. Unselected fields from the first file are listed first, followed by those in the second file, and so on.

Following is an example of how you might select and sequence fields so that a query of the customer master file produces a report that shows COMPANY, ACCTNUMBER, and PASTDUE in that order.

Select and Sequence Fields			
Type sequence number (0-9999) for the name of each field to appear in the report, press Enter.			
Seq	Field	Seq	Field
2	ACCTNUMBER	3	PASTDUE
1	COMPANY	---	DATELASTPD
---	FIRSTNAME	---	CURRENTDAT
---	MIDDLEINIT	---	YEAR
---	LASTNAME	---	MONTH
---	STREETADDR		
---	CITY		
---	STATE		
---	ZIPCODE		
---	TELENUMBER		
---	CRLIMIT		
---	BALDUE		
Bottom			
F3=Exit		F5=Report	
F13=Layout		F18=Files	
		F11=Display text	
		F20=Renumber	
		F12=Previous	
		F21=Select all	

If you then pressed the Enter key, the Query would rearrange the fields so that COMPANY is in the first position in the list, ACCTNUMBER is in the second position, and PASTDUE is in the third position. You could also press F20 so that the selected fields are renumbered in increments of 10.

Select and Sequence Fields			
Type sequence number (0-9999) for the name of each field to appear in the report, press Enter.			
Seq	Field	Seq	Field
10	COMPANY	---	BALDUE
20	ACCTNUMBER	---	DATELASTPD
30	PASTDUE	---	CURRENTDAT
---	FIRSTNAME	---	YEAR
---	MIDDLEINIT	---	MONTH
---	LASTNAME		
---	STREETADDR		
---	CITY		
---	STATE		
---	ZIPCODE		
---	TELENUMBER		
---	CRLIMIT		
Bottom			
F3=Exit		F5=Report	
F13=Layout		F18=Files	
		F11=Display text	
		F20=Renumber	
		F12=Previous	
		F21=Select all	

You could then select the remaining fields for output on the report by pressing F21 (Select all). Query would then select and supply sequence numbers for the remaining fields in the order that they appeared in the list.

Select and Sequence Fields

Type sequence number (0-9999) for the name of each field to appear in the report, press Enter.

Seq	Field	Seq	Field
10	COMPANY	130	BALDUE
20	ACCTNUMBER	140	DATELASTPD
30	PASTDUE	150	CURRENTDAT
40	FIRSTNAME	160	YEAR
50	MIDDLEINIT	170	MONTH
60	LASTNAME		
70	STREETADDR		
80	CITY		
90	STATE		
100	ZIPCODE		
110	TELENUMBER		
120	CRLIMIT		

Bottom

F3=Exit

F13=Layout

F5=Report

F18=Files

F11=Display text

F20=Renumber

F12=Previous

F21=Select all

Another way of making your selections is to first specify the *same* sequence number (a 1, for example) for all of the fields you want to select. Press the Enter key, and Query pulls all of those fields to the top of the list. You can then specify new sequence numbers to arrange the fields in the order you want for your report. This is particularly useful when there are too many fields to appear on a single display.

Query has the ability to show you additional information about the fields in the list area of the display. If only the field names are shown in the list and you press F11, you will see the descriptive text, the length, and the decimal positions for the fields. For more information on using F11, see “Using F11 to Display Additional Information” on page 2-11. You can also display a long comment (if one exists) for a field by moving the cursor to that field and pressing F23.

After you have confirmed the fields you want by pressing the Enter key a second time without making any changes to your sequence choices, Query completes this step and takes you back to the Define the Query display so that you can continue with other query tasks. If you previously selected more options on the Define the Query display, Query shows you the first display for the next option.

## Chapter 7. Selecting Records

This chapter describes how you can perform record selection tests so that your query output contains only selected records, such as records in which the value of a field is equal to a specified value. For example, you want to obtain information from an employee master file about all employees whose age is equal to or greater than 21. By using certain tests, you can select only these records from your file (and thus exclude those who are less than 21).

This selection process involves creating comparison tests that Query uses to select the desired records. You can specify one test or as many as 100 tests. If the result of the test or the combined result of several tests is true, the record being tested is selected and included in your query output.

### Letting Query Select Records

If you did not type a 1 next to the *Select records* option on the Define the Query display, all of the records from your selected files are included in your query output.

The Select Records display is shown during query definition if you typed a 1 next to the *Select records* option on the Define the Query display. Press F12 (Previous) to return to the previous display if you have changed your mind and now want all records in your output. (Anything you typed on this display will be ignored.)

### Selecting the Records You Want

Usually your reports are based on records that have something in common, such as a report that lists only those items in an inventory that are in short supply. Selecting records by creating comparison tests gives you the ability to specify that the records must contain (or not contain) particular information—in the case of the inventory items that are in short supply, you would want in your report only those items for which the quantity on hand is below a certain level. This type of report is usually more meaningful and easier to use than a report that contains all of the records from a file.

To select a record, you compare the contents of one or more fields (including result fields) with one or more specified values to see if a condition, or test, is true. For example, you want all persons with the last name (LASTNAM) equal to 'Clarke' to appear in your output.

Field	Test	Value
LASTNAM	EQ	'CLARKE'

The Select Records display lists fields you can use (including result fields) and asks you to specify your comparisons. This display is shown below with some sample fields from a customer master file shown in the *Field* column.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')

Bottom

Field	Field	Field	Field
ACCTNUMBER	STREETADDR	CRLIMIT	YEAR
COMPANY	CITY	BALDUE	MONTH
FIRSTNAME	STATE	PASTDUE	
MIDDLEINIT	ZIPCODE	DATEPAID	
LASTNAME	TELENUMBER	CURRENTDAT	

Bottom

F3=Exit	F5=Report	F9=Insert	F11=Display text
F12=Previous	F13=Layout	F18=Files	F20=Reorganize

A comparison has all of the following:

- A field to be compared
- A test
- One or more values to compare the field with

You can specify up to a maximum of 100 comparisons. Each comparison can use as many lines (up to 30 characters per line) as needed, up to a maximum of 100 lines total for all comparisons.

The Select Records display provides six input lines at a time for you to enter comparisons. If you need more than this, press the Roll Up key to get more blank input lines. If the cursor is positioned on any of the input lines (whether you have typed a comparison on it or not), you can use the roll keys to view all of the comparisons that you have entered.

## Comparison Fields

In order to be tested, the field must be one of the following:

- A field that exists in your selected file(s). This can be any field, including a field that you have not chosen to include in your output.
- A result field defined for this query.

When you specify a field in a comparison, you must put the file identifier followed by a period in front of any field name that appears in more than one selected file in the list. For example, if the field ACCTNUMBER exists in two of your selected files that have file IDs T01 and T02, you would have to specify T01.ACCTNUMBER or T02.ACCTNUMBER. If you did not include the file identifier, Query would not know from which file to get the account number needed for the comparison test. You can press F18 (Files) to see a list of the files that you selected and the file ID associated with each file.



## Comparison Values

The value you compare the field with can be:

- Another field
- A character constant
- A numeric constant
- A DBCS constant

The field and the value you are comparing must be the same data type (numeric or character). Following are valid comparisons for record selection tests:

- Character field with:
  - Character
  - DBCS-either
  - DBCS-open
- DBCS-either field with:
  - Character
  - DBCS-either
  - DBCS-open
  - DBCS-only
- DBCS-open field with:
  - Character
  - DBCS-either
  - DBCS-open
  - DBCS-only
- DBCS-only field with:
  - DBCS-either
  - DBCS-open
  - DBCS-only
- Numeric field with numeric

Usually you specify only one value per comparison. The exceptions are discussed in “Comparison Tests” on page 7-4.

## Fields as Values

If you use a field as a value (that is, in the *Value* column on the display), the field can be any field from the list in the lower part of the display.

An example of a situation where you might use a field as a value is if you want only the records—from a customer master file—whose balance due (in a field named BALDUE) is greater than their credit limit (in a field named CRLIMIT). In this example, you are comparing a field (BALDUE) with a value which is also a field (CRLIMIT).

The fields being compared do not have to be the same length, and numeric fields do not have to have the same number of decimal positions.

## Character Constants as Values

A character constant is simply characters enclosed in apostrophes (for example, 'xxx'). The apostrophes are important, because Query assumes that any group of characters not enclosed by apostrophes is a field name.

For example, if you want only the records for Jan Alison, you compare the NAME field with 'Jan Alison'. Also, note that if you do not use the apostrophes, Query tells you: Only one value is allowed for test.

The characters in the constant can be any combination of letters, numbers, or special characters (such as \*, ?, #, \$, @) that might be found in the tested field. You must use apostrophes around a character constant, even if it contains only numbers. You must also type uppercase and lowercase letters exactly as you want them. The special characters underscore ( \_ ) and percent ( % ) have certain meanings when used in a LIKE test.

If the character constant you specify contains an apostrophe, you must enter it as two apostrophes, so Query does not think it has reached the end of the constant. For example, if you are looking for records that list the street address as Granger's Circle, you type the constant as 'Granger''s Circle'. Query counts two apostrophes within a constant as a single apostrophe.

### **Numeric Constants as Values**

You must not enclose a numeric constant in apostrophes. A numeric constant can be from 1 to 31 digits long.

Do not use a currency sign (to indicate a monetary value) or a thousands separator (to indicate thousands, millions, and so on) within a numeric constant.

### **Comparison Tests**

You can specify these tests in comparisons:

<b>Test</b>	<b>Description</b>
<b>EQ</b>	Equal. Use this test to determine if the contents of the field and the value are equal.
<b>NE</b>	Not equal. Use this test to determine if the contents of the field and the value are not equal.
<b>GT</b>	Greater than. Use this test to determine if the the contents of the field is greater than the value.
<b>LT</b>	Less than. Use this test to determine if the contents of the field is less than the value.
<b>GE</b>	Greater than or equal. Use this test to determine if the contents of the field is greater than or equal to the value.
<b>LE</b>	Less than or equal. Use this test to determine if the contents of the field is less than or equal to the value.
<b>RANGE</b>	Range. Use this test to determine if the contents of the field is within a range that you have specified for the value.
<b>LIST</b>	List. Use this test to determine if the contents of the field is equal to one of the values in a list.
<b>LIKE</b>	Like. Use this test to determine if the contents of the field has a pattern similar to the value.

For all tests except LIKE, character fields and constants are compared character by character.

- If two fields or a field and a constant being compared are not the same length, Query treats the shorter field as if it has enough blanks at the end to make both fields the same length.

- The collating sequence determines greater than and less than conditions (for GT, GE, LT, LE, and RANGE comparisons). For more information on collating sequences, see Chapter 9, “Selecting a Collating Sequence.”

### Testing for Equal (EQ) and Not Equal (NE)

You use the equal and not equal tests to determine if the contents of a field is equal or not equal to the value you specify. In addition to using these to test numeric data, you can also test character data.

If the test is EQ, records are selected only if the field contains data that is exactly the same as the specified value. For example, if the only comparison is:

```
INTRAT EQ 18
```

records are selected only if INTRAT, a numeric field, contains a value equal to 18. For example, INTRAT could contain 18., 18.00, 00018, and so on.

If the test is NE, records are selected only if the field contains data that is different than the specified value. For example, if you want to select records that contain anything other than a value of SMITH in the field NAME, you specify:

```
NAME NE 'SMITH'
```

It does not matter to Query if the field called NAME is defined to be longer than five characters. Query looks for all records that do not exactly match SMITH. SMITHSON, Smith, and NEISMITH would all be selected as names that are not equal to SMITH.

### Testing for Greater (GT or GE), Less (LT or LE), and Range (RANGE)

You use the greater and less tests to determine if the contents of a field is greater than, greater than or equal to, less than, or less than or equal to the specified value. You use the range test to determine if the contents of a field lies within the specified range of values. In addition to using these to test numeric data, you can also test character data.

Some examples of greater and less tests are:

- NAME GT 'SMITH'

Records are selected if the field NAME contains a value in the collating sequence greater than SMITH.

- INTRAT GE 18

Records are selected if the field INTRAT contains a value that is greater than or equal to 18.

- BALDUE LT CRLIMIT

Records are selected if the data in the field BALDUE is less than the data in the field CRLIMIT.

- BALDUE LE CRLIMIT

Records are selected if the data in the field BALDUE is the less than or equal to the data in the field CRLIMIT.

When you test for RANGE, the contents of the field must be within the range of two values (greater than or equal to the first value but less than or equal to the second) for the record to be selected. On the Select Records display, you must specify two

values in the *Value* column. You must separate them by a blank, and the lower value must come before the higher value.

For example, you want to select records only for the months of February through August. The field named MONTH is a numeric field, and it contains a 1 to represent January, a 2 to represent February, a 3 to represent March, and so on. On the Select Records display, you would specify:

Select Records			
Type comparisons, press Enter. Specify OR to start each new group. Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE			
AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	MONTH	RANGE	2 8

To use the GT, GE, LT, LE, and RANGE tests for character fields and values, you may need to know the collating sequence. The collating sequence determines what characters are greater than or less than others. If you do not select a collating sequence different than EBCDIC, the EBCDIC collating sequence is used and:

- Most special characters are less than letters.
- Lowercase letters are less than uppercase.
- Letters are less than numbers.

For example, the characters A, 8, &, and b would sort from low to high as follows:

&  
b  
A  
8

For more information about selecting or defining a collating sequence, see Chapter 9, “Selecting a Collating Sequence.”

## Testing for Values in a List (LIST)

You use the list test to determine if the contents of a field is equal to one of the values that you list in the *Value* column on the Select Records display. In addition to using LIST to test numeric data, you can also test character data.

When you compare a field with a list, the record is selected if the contents of the field exactly matches one of the values you specify. The values you specify in the list:

- Must be numeric constants if you are comparing a numeric field with them
- Must be character constants if you are comparing a character field with them
- Must be character or DBCS constants if you are comparing a DBCS field with them
- Must be separated by blanks
- Cannot be field names

For example, if you want to select only records that have 04567, 00976, and 85432 in the ITEMNO field, you specify:

Select Records			
Type comparisons, press Enter. Specify OR to start each new group.			
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE			
AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	ITEMNO	LIST	04567 00976 85432
____	_____	____	_____
____	_____	____	_____

Your list must contain at least two values, and they need not be in any particular order. If all of the values in the list do not fit on one line, just continue them on the next line under *Value*. You must enclose each character constant in apostrophes and use two apostrophes where the character constant itself contains an apostrophe (see the name O'Grady in the following example).

For example, the following tests the field LASTNAME for a number of different last names:

Select Records			
Type comparisons, press Enter. Specify OR to start each new group.			
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE			
AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	LASTNAME	LIST	'Staples' 'Thorson' 'Smith' 'J
____	_____	____	ones' 'Alison' 'O'Grady'
____	_____	____	_____

## Testing for Values That Are Similar (LIKE)

You use the **LIKE** test to determine if the contents of a field has a pattern that is similar to the “test pattern” you specify for a value. You can use **LIKE** comparisons for character fields, but specifying a **LIKE** comparison for a numeric field causes an error message.

When you use a **LIKE** test, a record is selected if a certain part of the field has the same characters as the “test pattern” you specify for the comparison value. For example, you would use the **LIKE** test if you wanted to select all records that have a last name that begins with an A.

You must enclose the test pattern in apostrophes; use two apostrophes where the test pattern itself contains an apostrophe. You can use some special characters to represent the positions in the field that you do not care about:

- An underscore ( **\_** ) means skip one character at that position and do not test for that character. Each underscore takes the place of one character in the field.
- A percent sign ( **%** ) means skip as many characters as necessary to get to the end of the field or to the next specified character. Each **%** takes the place of zero or more characters in the field. (Thus, you need not write a test pattern that is 32 characters long just because the field is 32 characters long.)

The following rules apply to test patterns:

- A pattern must be no longer than, but it can be as long as, the actual field. Query does not count a **%** as a character and counts two apostrophes within a constant as one character when checking pattern length.

- A pattern must include at least one % character if the pattern is shorter than the actual field.
- A pattern must contain at least one character other than a %.
- A pattern must not contain two % characters next to each other (%%).

For example, if you are testing for an A in the first position of the LASTNAME field, and if:

- The field length is 1, you could specify 'A'
- The field length is 3, you could specify 'A\_\_'
- The field length is at least 1, you could specify 'A%'

You would type them on the display as follows.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	LASTNAME	LIKE	'A%'
_____	_____	_____	_____
_____	_____	_____	_____

If you are testing for an A in the last position of the field, you could specify '%A'. But note that if an 8-character field contained 'ANNA ', the LIKE test would fail because the last position in the field is a blank.

If you are testing for an E followed by an A two positions after it, and the field length is at least 3, you could specify

'%E\_A%'

Note that if an 8-character field contained any of the following, the LIKE test would be true:

'ANNE A. '                      'EVAN E. '                      'ANNE EVA'

## DBCS LIKE Tests

DBCS LIKE tests can be used in the *Value* column of the Select Records display to select records. The following types of LIKE patterns can be used for DBCS fields that are being tested: standard alphameric (non-DBCS) character constants, DBCS-only character constants, and DBCS-open character constants.

**Non-DBCS Character LIKE Pattern:** This pattern, which contains no DBCS data, can be used to test DBCS-either and DBCS-open fields. Use a % sign to skip any number of characters or none at all. Use an underscore ( ) to represent any single alphameric character. Although the LIKE pattern contains only alphameric characters, it can test DBCS-open fields that contain both DBCS data and alphameric data, since a % sign can be used to skip over both kinds of data.

**DBCS-only LIKE Pattern:** This pattern, which contains only double-byte characters, can be used for any DBCS field. Start the pattern with a shift-out character and end it with a shift-in character. Use the DBCS percent sign (%%) to skip any number of characters or none at all. Use the DBCS underscore ( ) to indicate that any double-byte character is accepted for that position. Although the LIKE pattern contains

only double-byte characters, it can test DBCS-open fields that contain both double-byte character data and alphameric data because a %% sign can skip over both kinds of data.

**DBCS-open LIKE Pattern:** This pattern, which contains both double-byte character data and alphameric data, can be used only for DBCS-open fields.

- The percent sign (%) skips any number of alphameric characters or double-byte characters, or none at all. It ignores shift-out and shift-in characters.
- The DBCS percent sign (%%) works the same way as the standard percent sign (%).
- The underscore ( ) represents one alphameric character. It does not represent a double-byte, shift-out, or shift-in character.
- The DBCS underscore ( ) represents one double-byte character. It cannot be used to represent an alphameric, shift-out, or shift-in character.

**Examples:** In the following examples, %% represents the DBCS percent sign, \_\_ represents the DBCS underscore, s/o represents the shift-out character, s/i represents the shift-in character, and a double alphameric character, such as DD, represents a single double-byte character.

```
DBCSFLD1 LIKE 's/o__DD__%%HH%%s/i'
```

selects only records in which the second character in field DBCSFLD1 is DD, the first and third characters are any double-byte characters, and in which at least one of the fourth through last characters is HH. This test could be used for any DBCS field that is at least ten characters long.

If DBCSFLD1 is a DBCS-open field, this test could select data that has alphameric characters, such as 's/oXXDDMMs/iAnns/oGGHs/i', for which the DBCS percent would skip over both double-byte characters and alphameric characters before reaching HH.

```
DBCSFLD2 LIKE 's/o%%__%%s/i'
```

selects only records in which field DBCSFLD2 contains at least one double-byte character. The DBCS underscore ( ) can stand for a double-byte character, but not an alphameric character. A different value, '%\_%', selects records that have at least one alphameric character. A value of 's/o\_\_\_\_s/i' selects those that have all double-byte characters for a field that is ten characters long.

```
DBCSFLD3 LIKE 's/oYY%%s/i A_o'
```

selects all records in which the field DBCSFLD3 begins with the double-byte character YY and ends with alphameric characters, the first of which is blank, the second of which is A, and the fourth is o. This test selects fields such as these: 's/oYYs/i Amo'; 's/oYYZZXXs/iMary Abo'; or 's/oYYs/iABCs/oTTWws/iM Aro'. It is not important that the percent between the double-byte character and alphameric parts of the value is a DBCS percent; the following two values are equivalent to the one used: 's/oYYs/i% A\_o' and 's/oYY%%s/i% A\_o'.

## Using More Than One Comparison Test

When you use more than one comparison, you need to tell Query how to connect them by typing a connection in the *AND/OR* column. The two types of connections are:

- AND connections
- OR connections

If you do not specify anything in the *AND/OR* column between comparisons, Query assumes AND. *All* of the comparisons that are connected by ANDs must be true for the record to be selected.

For example, to select records for all customers with the last name of 'Clarke' and who live in Arizona ('AZ') requires an AND connection:

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	LASTNAME	EQ	'Clarke'
AND	STATE	LIST	'AZ'
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Bottom

ACCTNUMBER	STREETADDR	CRLIMIT	YEAR
COMPANY	CITY	BALDUE	MONTH
FIRSTNAME	STATE	PASTDUE	
MIDDLEINIT	ZIPCODE	DATEPAID	
LASTNAME	TELENUMBER	CURRENTDAT	

Bottom

F3=Exit

F5=Report

F9=Insert

F11=Display text

F12=Previous

F13=Layout

F18=Files

F20=Reorganize

Although this example shows the AND typed in the *AND/OR* column, it is not necessary. (If you leave the *AND/OR* column blank, Query assumes an AND connection.) Comparisons connected with one or more ANDs are considered a group of comparisons.

The other kind of connection between comparisons is OR; that is, one or more of the comparisons (or groups of comparisons) must be true for the record to be selected.

Because Query assumes AND connections unless told otherwise, you must specify OR in the *AND/OR* column whenever you want an OR connection.

For example, to select records in which the last name is Kingsbury or the credit limit is greater than or equal to \$5,000 requires an OR connection.



Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	LASTNAME	EQ	'Kingsbury'
OR	CRLIMIT	GE	5000

You can use AND and OR connections together to be even more specific about which records to include in your report. The following example selects records for customers who placed orders from November, 1986, through January, 1987. Note that numeric constants are used for months.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	MONTH	LIST	11 12
AND	YEAR	EQ	86
OR	MONTH	EQ	1
AND	YEAR	EQ	87

Because using a combination of AND and OR connections can be confusing, you might want to use F5 to look at your report and make sure your comparisons work the way you expect.

If a combination of AND and OR connections seems particularly complex, you should probably look at the comparisons closely to see if you can use fewer connections to make the same record selection. For example, following are two ways of selecting records for customers from Rhode Island ('RI') who have a credit limit of \$1000 AND a balance due from \$900 to \$1000 during 1986 OR 1987.

The first method uses a combination of AND and OR connections and requires that you press the Roll Up key to see all the comparisons:

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	CRLIMIT	EQ	1000
AND	BALDUE	RANGE	900 1000
AND	STATE	EQ	'RI'
AND	YEAR	EQ	86
OR	CRLIMIT	EQ	1000
AND	BALDUE	RANGE	900 1000

More

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
AND	STATE	EQ	'RI'
AND	YEAR	EQ	87

The second method, which uses the LIST test and AND connections, selects the same records but needs fewer lines and is easier to read:

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	CRLIMIT	EQ	1000
AND	BALDUE	RANGE	900 1000
AND	STATE	EQ	'RI'
AND	YEAR	LIST	86 87

Bottom

### Adding and Deleting Comparisons

The prompt part of the Select Records display only has room to show six comparisons at a time. You can press the Roll Up key to get blank input lines after the last line you typed. When you have specified more than six comparisons, you can press the Roll Down key to see the previous ones.

If you want to add another comparison between two comparisons that you have already typed, you can press F9 to insert a blank line where you need it so that you do not have to retype everything. The new line is added after the line on which the cursor is positioned when you press F9. You can also press F9 instead of the Roll Up key to add lines as you type in comparisons.

If you change your mind about a comparison and want to delete it from the group, just use the space bar or Field Exit to blank it out. If you change your mind and want to delete all of your comparisons, press F12 (Previous). Anything that you entered on the Select Records display is then ignored.

If you have blanked out a line or two and are at the last available blank line and need more lines, you can press F20 to reorganize the space. Query moves the blank lines to the end of the comparisons. You see the first six comparison lines on your display and must press the Roll Up key to get to the blank lines or to the place where you want to insert a line. If you run out of space but have no blank lines to move, you have to redesign your comparisons so that they fit into the 100-line limit.

## Selecting Records for an Office Dependent Column List

A **dependent query** is used in data/text merge to relate the column list part to the multicopy part in an Office form letter. Such a query can only be used for this one specialized purpose; you cannot display or print a report using a dependent query.

In “An Example of a Dependent Column List Merge,” a dependent query is used to print a form letter to customers, listing their purchases for the year. The special part of a dependent query is its Select Records display. One or more of the values on the display has a colon before the field name, such as this:

```
CUSNAME  EQ  :NAME
```

The colon indicates that the query is a dependent query. It also indicates that the field called NAME, the dependent value, is in a different query or file (this makes the query *dependent* on the other query or file). Pressing the Enter key on the Select Records display when it has such a colon shows the Specify Dependent Value Qualifiers display. On this display, you indicate the name of the file or query that contains the dependent value, the library in which the file or query is stored, and if the dependent value is in a file, the member name.

See *Word Processing User's Guide* for additional information about how to create multiple copies of a document and how to use column list merge.

### An Example of a Dependent Column List Merge

A company is sending letters to customers whose credit limit is greater than \$500. Each letter will contain a list of the items the customer purchased and the prices of the items. The document starts with “To:” followed by a multicopy instruction of the customer's name field. This name field, NAME, is taken from a query called QRY1 in a library called CUST. (QRY1 is based on a credit information file, CUS89. QRY1 selects only records that have a credit limit value greater than \$500.)

In the body of the letter is a line, “These are your purchases: ” Below that line are column list instructions for two fields, one for the item description and one for the price. Both instructions refer to QRY2, which is also in library CUST. On its Select Records display, QRY2 has the comparison CUSNAME EQ :NAME shown. CUSNAME is the name field for the purchase file used for QRY2. On its Specify Dependent Value Qualifiers display, QRY2 indicates that the field NAME is in query QRY1, which is also in library CUST.

One letter will be made for each record selected by QRY1, that is, for each customer with a credit limit greater than \$500. The letter will be to the customer whose name is in field NAME of that record. It is easier to understand the effect of a dependent value if the effect is examined for a single letter, say the one for J. S. Alison. For this letter, the comparison CUSNAME EQ :NAME is, in effect, CUSNAME EQ 'J. S. Alison'. For every record in the purchase file that has a CUSNAME value of 'J. S. Alison', the item description and price will be put into this letter.

A particular letter may have several items and prices listed. If a customer has not made any purchases, the letter to that customer is not printed.

This text instruction is for multiple letters and refers to query QRY1 in library CUST.

To: -&NAME

Thank you for your business. Many of our customers appreciate a year-end summary. These are your purchases:

Item Description	Price
-----	-----
-&ITEM	-&PRICE

Both of these text instructions are column list and refer to query QRY2 in library CUST.

When the letter is printed, it might look like this:

To: J. S. Alison

Thank you for your business. Many of our customers appreciate a year-end summary. These are your purchases:

Item Description	Price
-----	-----
Towel	7.00
Washcloth	2.50
Soap dish	2.99

Following is an evaluation of the example:

- The multicopy instruction, `—&NAME`, and the dependent value, `NAME` (from QRY1 in library `CUST`), refer to the same query, QRY1.
- The dependent value is used to compare the name fields from two files, the credit file and purchase file. In general, the field names can be different (`NAME` and `CUSNAME`) or the same. But the fields themselves always must be comparable. You could not compare name fields if one started with first name and the other with last name.
- The field `NAME` is used for both the multicopy (multiple letters) text instruction and as part of the dependent value. That is not necessary. The dependent comparison could have compared customer numbers, for example, instead of names.
- If the letters were to *every* customer in purchase file `CUS89`, the multicopy (multiple letter) instruction for `NAME` would reference file `CUS89` instead of query QRY1, and the dependent comparison would be `CUSNAME EQ :NAME`. In this case, QRY2 would still be needed but QRY1 would not.
- QRY1 can be run as a query in the normal way, but QRY2 cannot because it has a dependent value.

## Rules and Guidelines for Multiple Copies with Dependent Column List

- At least some of the column list instructions must refer to a query that contains a dependent value.
- In the same document, column list instructions cannot refer to more than one query that contains a dependent value.
- At least one multiple copy instruction must be placed before *all* dependent column list instructions.
- The dependent values in the query must refer to the same file or query to which the multiple copy instruction(s) refer.
- A document that contains dependent column list instructions can also contain fixed data and ordinary column list instructions (that is, column list instructions that are not customized).
- A query named in a dependent value cannot itself contain a dependent value.
- You can use a query with a dependent value only for column list text instructions in a document. On the *Work with Queries* or *Exit Data/Text Merge* displays, select only option 7 (column list) for a query with a dependent value; do not select options 6 or 8.
- You must save a query with a dependent value in order to later use that query for a Office document. You cannot run the query without processing the document that uses the data. Although this means you cannot press F5 to see a report, you can press F13 to see the layout.
- You should carefully check the names you type in the *Value* column on the *Select Records* display when you use a dependent value because no errors are found until the saved query is used by Office.



## Chapter 8. Selecting Sort Fields

This chapter describes how you can select sort fields to control the arrangement of the data in your query output. To Query, a sort field is a field whose contents are used to sort the output records in a particular order; for example, if you wanted to use a customer master file to obtain a list of all your customers, you might want those customers listed in a particular order, such as alphabetically by last name, alphabetically by state, or both alphabetically by state and then by last name. In this case, you would need to specify one or more sort fields to ensure that your output is in the order you want it to be in.

### Letting Query Sort for You

You can let Query retrieve the data directly from the data base and include it in your query without any sorting. If the sequence of the data in your report is not important, you do not need to worry about selecting sort fields. However, a thorough knowledge of data base concepts, including file type and access paths, would be needed if you wanted to predict the sequence of your output. (For more information on file types and access paths, see the *Data Base Guide*.)

If you did not type a 1 next to the *Select sort fields* option on the Define the Query display, the Select Sort Fields display is not shown while you work with your query definition, and the data will not be sorted when you run the query.

If you typed a 1 next to the *Select sort fields* option on the Define the Query display, the Select Sort Fields display is shown during query definition. Press F12 (Previous) to return to the previous display if you have changed your mind and do not want to select any sort fields. (Anything you typed on the display will be ignored.)

### Selecting the Sort Fields You Want to Use

On the Select Sort Fields display, as shown below, you select the sort fields that you want by entering a sort priority number in the *Sort Prty* column. You can select up to 32 sort fields from the list. (The list on this display shows only those fields that were selected on the Select and Sequence Fields display; if no fields were selected there, the list shows all of the fields.) The total length of all the sort fields cannot be greater than 256 characters (that is, if you add up the lengths of the sort fields, the total cannot exceed 256 characters).

Based on the number you type for each field you select as a sort field, Query establishes a sort priority. You can use any numbers from 0 to 999—use the lowest number for your highest priority sort field. If you use numbers like 10, 20, 30, and so on, you can easily add another sort field later.

You can also specify whether you want the sort field sorted in ascending order (from lowest to highest value) or descending order (from highest to lowest value) by typing an A (for ascending) or a D (for descending) in the *A/D* column. (Note that the results of the sort are dependent on the collating sequence you select. If you sort on a character field that contains a mixture of uppercase and lowercase letters, the collating sequence you use can make a difference. For more information on collating sequences, see Chapter 9, “Selecting a Collating Sequence.”) If you leave the *A/D* column blank for a field, the sort for that field is done in ascending order.

Select Sort Fields

Type sort priority (0-999) and A (Ascending) or D (Descending) for the names of up to 32 fields, press Enter.

Sort	Prty	A/D	Field
			ACCTNUMBER
	30	-	INIT
	20	-	LASTNAME
		-	STREETADDR
		-	STATE
		-	CITY
		-	ZIPCODE
	10	D	CRLIMIT

Bottom

F3=Exit
F5=Report
F11=Display text
F12=Previous

F13=Layout
F18=Files
F20=Renumber

When you press the Enter key after typing your sort priority numbers, Query rearranges the fields on the display in the following order:

- If fields were selected on the Select and Sequence Fields display, they are listed in the following order:
  1. All sort fields (if any) previously selected on this display, in the order specified.
  2. Fields selected for the query, but not selected as a sort field. These fields are listed in the order they were specified on the Select and Sequence Fields display.
- If fields were *not* selected on the Select and Sequence Fields display, the fields on this display are shown in the following order:
  1. All sort fields (if any) previously selected on this display, in the order specified.
  2. Any result fields that have been defined for this query but were not selected.
  3. All other fields not selected, in the order they exist in the record format definitions for the selected files. Unselected fields from the first file are listed first, followed by those in the second file, and so on.

Query then displays a message Press Enter to confirm, so that you have a second chance to review your sort fields and change them if you want.

To remove a sort field from your selections, blank out the number in front of that field name. It is not necessary to renumber the other fields. To change the priorities of the sort fields, just change the numbers.

If you make any changes, press the Enter key again. The list of field names is rearranged and is shown with the sort fields first, in the sort priority you specified followed by the remaining fields that were selected for output. If you want to renumber the fields in increments of 10 (10, 20, 30, and so on), press F20.

When you are satisfied that your sort field selections are correct, press the Enter key a final time to end sort field selection.



An example of how you would specify sort priorities is this: Assume that you are the credit manager for the U.S. division of an international mail order company, and you want a report of customer names and addresses organized as follows:

- Customers with the highest credit limit should appear first, then the next highest, and so on.
- If two or more customers from the same state have the same credit limit, these customers should be grouped by state.
- The states, and the customers listed for each state, should appear alphabetically.

In order to obtain the order you want, your first sort field is credit limit (CRLIMIT), in descending order (from highest to lowest); your second sort field is state (STATE); your third sort field is last name (LASTNAME); and your last sort field is first name (INIT).

You would complete the Select Sort Fields display as follows:

Select Sort Fields

Type sort priority (0-999) and A (Ascending) or D (Descending) for the names of up to 32 fields, press Enter.

Sort	Prt	A/D	Field	Text	Len	Dec
			ACCTNUMBER	Account number	6	
40	-		INIT	Customer first and middle initial	2	
30	-		LASTNAME	Customer last name	20	
	-		STREETADDR	Street address	20	
	-		CITY	City	15	
20	-		STATE	State abbreviation	2	
	-		ZIPCODE	Zip code	5	
10	D		CRLIMIT	Credit limit amount	7	2

Bottom

F3=Exit
F5=Report
F11=Display names only
F12=Previous

F13=Layout
F18=Files
F20=Renumber

Notice that a D has been typed in the *A/D* column for the CRLIMIT field. The STATE, LASTNAME, and INIT fields will all be sorted in ascending order (which is the order you want).

Also notice that this display shows additional information including the text, length, and decimal positions for each field. While you are selecting sort fields you can press F11 to alternate between showing only the names of the fields and showing both the names and additional information about the fields. For more information about using F11, see “Using F11 to Display Additional Information” on page 2-11.

After pressing Enter, the Select Sort Fields display appears again, but this time the fields given priority are listed first in the order specified and the fields not used as sort fields are moved to the bottom of the list:

Select Sort Fields

Type sort priority (0-999) and A (Ascending) or D (Descending) for the names of up to 32 fields, press Enter.

Sort	Prty A/D	Field	Text	Len	Dec
10	D	CRLIMIT	Credit limit amount	7	2
20	A	STATE	State abbreviation	2	
30	A	LASTNAME	Customer last name	20	
40	A	INIT	Customer first and middle initial	2	
—	—	ACCTNUMBER	Account number	6	
—	—	STREETADDR	Street address	20	
—	—	CITY	City	15	
—	—	ZIPCODE	Zip code	5	

Bottom

F3=Exit
F5=Report
F11=Display names only
F12=Previous

F13=Layout
F18=Files
F20=Renummer

Notice that because you left the *A/D* column blank for the STATE, LASTNAME, and INIT fields, Query replaces the blank with an A to show that ascending order is used.

The sort in this example provides a report that looks something like this:

Account Number	Init	Last Name	Street Address	City	State	Zip Code	Credit Limit
938485	CA	Johnson	101 2nd St.	Montvale	GA	30545	9999.00
583990	GF	Abraham	20 Vineview	Elk River	MN	55330	9999.00
693829	NO	Thomas	8256 1st Ave.	Twostone	WY	82609	9999.00
846283	JS	Alison	20749 73rd St.	Ottawa	MN	56342	5000.00
938472	EJ	Henning	1 Oil Lane	Oiltown	TX	75217	5000.00
029384	MA	Brown	904 38th St.	New York	NY	12201	1000.00
397267	OS	Tyron	1039 20th Ave.	Falls	NY	14841	1000.00
475938	MA	Doe	P.O. Box 90834	Reading	CA	95685	700.00
930484	BJ	Hubbard	10 Colusa	Junction	CA	91722	700.00
192837	CE	Lee	98 Elm St.	Falls	NY	14841	700.00
392859	LL	Vine	18940 Main St.	Tombstone	VT	05046	700.00
389572	RS	Stevens	38 Yale Blvd.	Deer Falls	CO	80226	400.00
839283	AC	Jones	1984 5th Ave.	New York	NY	13041	400.00
493264	JS	Jones	P.O. Box 8910	New York	NY	13088	400.00

The highest credit limits (9999.00) are listed first, followed by the next highest. Within each group of credit limits, the records are listed alphabetically by state. Within each group of states, the customers are listed alphabetically by last name (such as Brown and Tyron in New York, and Doe and Hubbard in California). If two or more customers with the same last name live in the same state and have the same credit rating, the order of the records is determined alphabetically by first and middle initials (such as AC Jones and JS Jones in New York).

## Chapter 9. Selecting a Collating Sequence

This chapter describes how you select the collating sequence to be used for your query. The collating sequence is used for certain operations (like sorting) that involve data in character fields. It assigns a “value” to each alphameric and special character so that Query knows how to perform operations on character fields and character constants.

---

### Letting Query Select a Collating Sequence

If you did not type a 1 next to the *Select collating sequence* option on the Define the Query display, Query selects a collating sequence for you. If you have never saved a query definition or saved a collating sequence default value, your collating sequence is the extended binary-coded decimal interchange code (EBCDIC) until you change it.

### Setting Your Default

Generally, you will use the same collating sequence for all of your queries. For most users, the *language* collating sequence (provided on most systems) is the only one needed. If you select the *Select collating sequence* option on the Define the Query display when you are creating or changing a query and save your collating sequence option as a default in your query profile, all your queries can use this same collating sequence option without you having to specify it in each query definition. (Don’t worry—this does not mean that you *must* use this same collating sequence for *all* of your query definitions. It just means that, if you save the collating sequence option as a default, you will not have to select the *Select collating sequence* option for every query that you create; you will only have to select it when a query you are creating requires a *different* collating sequence.)

After you have selected the collating sequence option that you want on the Select Collating Sequence display, you can save your option as a default value in your query user profile by pressing F24 (Save as default) while you are still viewing the display.

If you decide to define your own collating sequence (option 3 on the Select Collating Sequence display), you can also save your collating sequence (as a default) on the Define Collating Sequence display by pressing F24 while you are still viewing that display.

---

### Purpose of a Collating Sequence

A collating sequence determines what characters come before others when operations are performed on character fields for the purpose of:

- Selecting records
- Joining files
- Sorting records
- Computing the minimum and maximum values of a field
- Determining when a report break occurs

To collate means to place items in proper sequence or to check that items are in proper sequence. For Query purposes, collating sequences apply to *character* fields, not numeric or DBCS fields. The four choices of collating sequences are:

- The EBCDIC collating sequence
- The collating sequence, provided by Query, for the language of your country
- A collating sequence that you define
- A translate table that exists in one of your libraries

## How a Collating Sequence Affects a Query

Several definition steps in Query use the selected collating sequence to determine the final results when your query is run. A collating sequence is used:

- When you join files together by comparing a character field in one file to a character field in the other
- When you use comparison tests like GT (greater than), LT (less than), GE (greater than or equal), and LE (less than or equal) to select records
- When you use sort fields
- When you define minimum and maximum field values
- When you use report breaks

## Selecting a Collating Sequence

Selecting a collating sequence requires that you have an understanding of how the data exists in your files. For example, if both uppercase and lowercase letters exist in your character fields, you will have to decide if both types of *cases* (that is, *uppercase* and *lowercase*) are to be treated the same. Once you have made this determination, you can select the collating sequence that produces the desired results, or you can define a collating sequence of your own.

Select Collating Sequence

The selected collating sequence will be used for character fields when sorting, selecting records, joining files, finding minimum and maximum values, and determining when a control break has occurred.

Type choices, press Enter.

Collating sequence		
option . . . . .	1	1=Use EBCDIC collating sequence
		2=Use language sequence
		3=Define a collating sequence
		4=Use translate table

For choice 4=Use translate table:

Table . . . . .	_____	Name, F4 for list
Library . . . . .	_____	Name, *LIBL, F4 for list

F3=Exit  
F13=Layout

F4=List  
F18=Files

F5=Report  
F24=Save as default

F12=Previous

## Using the EBCDIC Collating Sequence

EBCDIC is a standard collating sequence. All of the alphameric and special characters are assigned a hexadecimal value, and then those hexadecimal values are put in order to make up the EBCDIC collating sequence. One of its advantages is that it distinguishes between uppercase and lowercase letters.

The EBCDIC collating sequence, in ascending order, is as follows:

- blank
- miscellaneous characters, such as . + & % )
- a through r
- ~ (tilde)
- s through z
- {
- A through I
- }
- J through R
- \
- S through Z
- 0 through 9

To see what the EBCDIC collating sequence looks like, select option 3 (Define a collating sequence) on the Select Collating Sequence display and press the Enter key. Next you will see the Define Collating Sequence display. Then if you press F14 (EBCDIC sequence), Query shows you the characters and their sequence numbers in the EBCDIC collating sequence.

Each character used by the computer is listed. You can use the roll keys to page through the list of characters. Press F11 to show the hexadecimal value of each character under the *Hex* column. Use F12 to return to the Select Collating Sequence display.

## Using the Language Collating Sequence for Your Country

You may want to select the collating sequence provided for your country so that character data is sorted in a more useful order for your language.

For example, in the United States and Great Britain, the collating sequence provided (in addition to EBCDIC) is English. Using the English collating sequence, character data is sorted in a different order than when using the EBCDIC collating sequence because the characters have been given different sequence numbers. Using the English collating sequence, character fields beginning with lowercase a and uppercase A are sorted together because the two characters have the same sequence number in the collating sequence. If more than one character has the same sequence number, those characters are sorted together.

## Defining Your Own Collating Sequence

You may want to define your own collating sequence so that character data is sorted according to your particular needs.

For example, you have a two-digit customer account number field that has gone beyond its maximum of 99, and entries in this field after 99 are alphabetic—A1, A2, and so on. You want the alphabetic entries sorted to follow the numeric entries. You can define your own collating sequence so that the alphabetic data follows the numeric data for this particular query.

To define your own collating sequence, type a 3 in the *Collating sequence option* prompt on the Select Collating Sequence display and press the Enter key.

```

Select Collating Sequence

The selected collating sequence will be used for character fields when
sorting, selecting records, joining files, finding minimum and maximum
values, and determining when a control break has occurred.

Type choices, press Enter.

Collating sequence
option . . . . . 3      1=Use EBCDIC collating sequence
                        2=Use language sequence
                        3=Define a collating sequence
                        4=Use translate table

```

The Define Collating Sequence display is the next display you will see.

```

Define Collating Sequence

Position to . . . . . _ Char

Type sequence number (0-9999) beside each character, press Enter.
(Use the same sequence number to have characters collate in a group.)

```

Sequence	Char	Hex	Sequence	Char	Hex	Sequence	Char	Hex
1210		B8	1310	B	C2	1410		CC
1220		B9	1320	C	C3	1420		CD
1230		BA	1330	D	C4	1430		CE
1240		BB	1340	E	C5	1440		CF
1250		BC	1350	F	C6	1450	}	D0
1260		BD	1360	G	C7	1460	J	D1
1270		BE	1370	H	C8	1470	K	D2
1280		BF	1380	I	C9	1480	L	D3
1290	{	C0	1390		CA	1490	M	D4
1300	A	C1	1400		CB	1500	N	D5

More...

```

F3=Exit      F11=Characters only      F12=Previous      F14=EBCDIC sequence
F15=Language sequence  F16=Use default      F20=Renumber      F24=Save as default

```

You are shown a list of characters with a sequence number assigned to each character. Characters are assigned sequence numbers beginning with 10 and incremented by 10 in ascending order. A message stating what collating sequence is used is shown on the bottom of the display if a sequence was not saved with the query. You can use EBCDIC or the language sequence as a base for defining your own collating sequence by pressing F14 (EBCDIC sequence) or F15 (Language sequence).

Use the roll keys to page through the list of characters. Certain characters cannot be displayed on some terminals; therefore, some sequence numbers may not have a character shown beside them. Press F11 and the hexadecimal value of each character is shown even if the character cannot be displayed on your terminal. You can use the *Position to* prompt to find a specific character in the list quickly. (You can enter the hex value of the character, if you know it and if your keyboard has this feature, or the character itself.)

To define your own collating sequence, change the sequence numbers beside those characters whose sequence you want to change. Each character must have a sequence number. You can specify the same sequence number for two or more

characters—these characters will be treated as equal when operators are performed on them.

After you have renumbered the characters in the sequence you want, press the Enter key. The list of characters is shown in the sequence you specified. To renumber the characters in this new sequence by increments of 10, press F20. Using F20 to renumber makes it easier to specify a new sequence later. You must press the Enter key again to confirm that this is the sequence you want to use. The characters are renumbered, by increments of 10, when you leave this display.

You can also save your collating sequence as a default by pressing F24 while you are still viewing this display.

## Selecting a Translate Table

If your query needs a sequence that is not provided for with the available collating sequences, and creating a user-defined collating sequence does not produce the desired results, you may find that using a translate table will create the correct sequence for your query. Translate tables, which are similar to user-defined collating sequences, are created and used to translate or scramble data.

If you want to use a translate table, select option 4 on the Select Collating Sequence display. Enter the table name and the library that contains the table you want. If you would like Query to list the existing tables for you, position the cursor to the *Table* prompt and press F4. An example of the Select Translate Table display follows.

Select Translate Table

Library . . . . .	*LIBL	Name, *LIBL, F4 for list
Subset . . . . .	_____	Name, generic*
Position to . . . . .	_____	Starting character(s)

Type option (and Table and Library), press Enter.  
1=Select

Opt	Table	Library
-	TABLE1	MYLIB
-	TABLE2	MYLIB
-	TABLE3	MYLIB
-	TABLE4	MYLIB

F4=List	F11=Display text	F12=Previous	Bottom F19=Next group
---------	------------------	--------------	--------------------------

For more information on using lists, see “Using Lists” on page 2-4.





## Chapter 10. Specifying Report Column Formatting

The first part of this chapter describes how you control the format of your query output. You can change the spacing before the report columns, the headings above the columns, and the report field lengths.

In the second part of this chapter, the four ways of editing numeric fields are described. Since numeric fields of information are stored in data base files without any punctuation, you can edit them so that they are easier to read when they appear in a query report or display.

### Formatting the Columns of the Query Report

**Note:** The first time that you select the Specify Report Column Formatting option, the information that is shown on the display for column headings, field lengths, and decimal positions is taken from the field definitions and result field definitions. If column headings are defined for the fields, they are shown; otherwise, the field names are used as the column headings.

You can specify the following information about how the columns should appear in printed and displayed reports:

- The number of spaces to the left of each column
- The wording of headings above the columns
- The size of the fields in the columns

Query ignores any column formatting you specify when you send detailed output to a data base file. However, if you later use that query to produce a report, the column formatting you specify is used.

Query uses the field size you specify for a query when you send summary-only output to a data base file. Summary-only output is described in Chapter 13, “Selecting Output Type and Output Form.”

### Column Spacing

If you want to change the column spacing for a field, type a number from 0 through 99 to indicate the number of spaces you want to appear to the left of that field's column.

Unless you change the column spacing for fields, Query puts no spaces in front of the first column and puts two blank spaces in front of all the other columns in the report. Before you specify any values, you should be familiar with the possible effects of any changes. For example, if you ask Query to put several blanks in front of more than one field, the new width of your output might exceed the width of the print line on your printer, and your output may be truncated (that is, part of it may have dropped off). If this happens, you could specify less space between the columns, or you could specify a Y (Yes) for line wrapping on the Select Output Type and Output Form display (see Chapter 13, “Selecting Output Type and Output Form”).

## Column Headings

For each field that has a column heading defined in its field definition (such as in IDDU field definitions), that information is used by Query unless you change it. For result fields, any column headings specified on the Define Result Fields display are also used by Query. For fields that have no headings defined, the field names are used as the headings (in heading line 1), unless \*NONE is specified in heading line 1. If you specify \*NONE, it must begin in the first position of the first heading line and must be all uppercase letters; the rest of the heading must be blank.

Each column heading appears in the report exactly as you type it. Each heading can be up to three 20-character lines, and you can use any characters you want (see the heading for the INIT field on the following display).

Specify Report Column Formatting					
Type information, press Enter. (Type *NONE in a column heading for no field heading in a report.)					
Field	Column Spacing	Column Headings	Len	Dec	Edit
LASTNAME	0	LASTNAME	30		
INIT	2	First & Middle Initials	2		
STARTTIME	2	Start Time	6		*
Bottom					
F3=Exit	F5=Report	F12=Previous			
F13=Layout	F16=Edit	F18=Files			

If you want, for example, the headings of all your columns to line up on the lowest heading line, you must type each one on the display that way.

If you change a heading but decide you want to use the original heading, blank out the heading you typed. The original (default) heading will be used in the report; it will also appear on this display the next time you return to this display. If you want to change the heading for a result field, you may change it on the Define Result Fields display, as described in Chapter 5, "Defining Result Fields."

## Length and Decimal Positions

The length first shown for each field from a file is the length defined in the field definition. The length first shown for each *result field* is the length that Query calculates for you, or is the value that you typed in the *Len* column on the Define Result Fields display.

For character fields, length is the total number of characters in the field. For numeric fields, length is the number of digits to the left and right of the decimal point, but does not include the decimal point or any other editing characters (like a currency symbol).

Changing the *Len* value on this display affects only how the field appears in this query. The actual length is not changed in the field definition, and the actual length is used for all other field processing done by Query, such as sorting, report breaks, and so on. If you want to change the actual length for a *result* field, you should make the changes on the Define Result Fields display rather than during formatting.

If you specify a length, the following rules apply:

- 0 through 32,766 for character fields
- 0 through 31 for numeric fields in packed, zoned, or binary form
- 0 through 9 (single-precision) or 0 through 17 (double-precision) for floating-point fields

For DBCS fields, you cannot change the length to anything but 0, which excludes the field from the report. For DBCS character fields, the type of DBCS field is shown here: a J means DBCS-only data, an O means DBCS-open (mixed) data, and an E means DBCS-either data.

For numeric fields, if you increase or decrease the value in *Dec*, you should increase or decrease the value in *Len* the same amount. If you change the value in *Len* or *Dec* but decide you want to use the original field definition value, blank out the number you typed. If there is a value in the *Len* or *Dec* column for the same field, you must blank it out also. If you blank out the values, the original length and decimal values are used in the report.

The length and the number of *decimal positions* first shown for each numeric field from a file is the same as defined in the field definition. The length and the number of decimal positions first shown for each *result field* is the number that Query calculates for you, or is the number that you typed in the *Len* and *Dec* columns on the Define Result Fields display. For numeric fields this number indicates the number of positions to the right of the decimal point. For character fields, this field is blank and must be left blank.

Changing the *Dec* value affects only how the field appears in your query output. The actual value is not changed in the field definition. If you want to change the actual number of decimal positions for a result field, you should make the changes on the Define Result Fields display rather than at this time.

For numeric fields, you can type your own value (0 through 31) for decimal positions, but you must not enter a value for *Dec* that is greater than the length of the field.

## Omitting Fields from a Report

You can generate different versions of the same basic query output by selecting all of the possible fields you might want to include when you select and sequence fields, and then omit certain fields during the formatting processing by entering a length of zero on the Specify Report Column Formatting display. Each of these versions can be saved and run as separate queries.

You may also want to use a field for sorting or for a report break, but not to appear in the query report. If you change the field length (*Len* prompt) to zero on the Specify Report Column Formatting display, the field is not printed, displayed, or used for summary output sent to a data base file. The field is still used for sorting, record selection, report breaks, and break text insert (see the appropriate Chapters for details).

If you type a zero in the *Len* column, and there is a number in the *Dec* column for the same field, you must also enter a zero for the *Dec* column.

**Note:** You cannot change the order of the fields on your report during the formatting process. If you determine that you need to change the order of the fields in your output, you must go back to the Define the Query display and choose the *Select and sequence fields* option (see Chapter 6, “Selecting and Sequencing Fields”).

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## Editing Numeric Fields

The first method you should consider for editing numeric fields is to not enter any edit options and let Query make the decisions for you. However, if this method does not provide the output results you want, you can use one of the four edit options that are discussed in this chapter.

The *Edit* column on the Select Report Column Formatting display is used by Query to indicate whether or not any numeric field editing has been defined for any of the numeric fields in your query. If an asterisk (\*) is shown for a field, there are editing override values specified in your query definition for the field; the field values are edited in the report using those values. This column is blank for character fields and for numeric fields that are edited using only default values. (The default or original values can be in the file definition or in system-supplied default values used by Query.)

If you want to edit a numeric field—that is, specify numeric field editing values that will be used as part of your query definition, position the cursor on that field and press F16 (Edit) to go to the Define Numeric Field Editing display. Depending on the choice you make on this display, Query will present the appropriate display to allow you to describe the rest of your edit definition. When no numeric editing override values are saved for a field in your query definition, the editing actually used for the field comes, first, from the original field definition (in a file definition) or it comes, last, from system-supplied default values.

**Note:** If you want to *remove* all override editing for a particular field (as defined in the query), press F16 here to go to the Define Numeric Field Editing display, then press F16 again there (F16 is *Remove edit* there). When you press F16 to remove editing, *all* editing definitions for all four editing options defined for that field are removed.

## Defining Numeric Field Editing

The Define Numeric Field Editing display allows you to edit any of your numeric fields, one field at a time. Floating-point fields, however, *cannot* be edited.

Define Numeric Field Editing

Field . . . . . :

Text . . . . . :

Heading 1 . . . . . :

Heading 2 . . . . . :

Heading 3 . . . . . :

Length . . . . . :

Decimal . . . . . :

Sample . . . . . : -9,999.99 \_\_\_\_\_

---



---

Type choice, press Enter.

Edit option . . . . . 1      1=Numeric editing choices  
    2=Date or time editing choice  
    3=Edit code  
    4=Edit word

F3=Exit              F5=Report              F11=Change sample      F12=Previous  
 F13=Layout          F16=Remove edit      F18=Files

The Define Numeric Field Editing display allows you to specify the type of editing you want to use to edit a numeric field; the editing determines how the values for the field are to appear in your query report. This is the first of two displays used to define the editing; the second display to be shown depends on which edit option (1 through 4) you select on this display. For example, if you choose option 2, you go to the display that allows you to specify the type of separator character you want to use in a date field.

Shown on the Define Numeric Field Editing display is the name of the numeric field to be edited, the field's report-related information, and an edited sample value for the field as it would appear in the report with the editing values that are currently defined for it. The field is the one that the cursor was positioned to on the Specify Report Column Formatting display when F16 (Edit) was pressed.

Each of the edit options are described as follows:

**1 = Numeric editing choices**

Shows the Describe Numeric Field Editing display, on which you can describe several editing attributes for the field. You can select the characters to be used for the decimal point, thousands separator, negative sign, and currency symbol; and you can specify how zero values and leading zeros are to be handled.

**2 = Date or time editing choice**

Shows the Describe Date/Time Field Editing display, on which you can select the separator character you want used in a date or time field.

**3 = Edit code**

Shows the Specify Edit Code display, on which you can select the edit code and modifier (if any) to be used to edit the field.

**4 = Edit word**

Shows the Specify Edit Word display, on which you can define your own edit words (values) to be used on the field.

If an asterisk (\*) was shown in the *Edit* column on the Specify Report Column Formatting display, editing override values are already defined in this query for the field. If an asterisk was shown there, then the result of the current editing in effect

for the field is shown in the *Sample* field on this display, and the type of editing is indicated by the edit option currently specified in the *Edit option* prompt. If no asterisk was shown there, then the sample field is edited here according to the editing specified in the field definition or in the system-supplied default values assumed by Query.

If you press F11, you can change the value shown in the edited sample. Each time you press F11, you can see either the largest positive number (all 9s), zero (0), or negative 1 (−1). You can change the edit option and press F11 at the same time to see the effect of each set of editing overrides or default values. Also, if you change the edit option number and press Enter, you go to the definition display for that option where you can look at or change how the editing for that option is defined. When you press F10 (Process/Show previous) to return, the edited sample shows the results of the editing values for that option.

If you want to see the editing for summary totals, if any exist, use F5 (Report) or F13 (Layout).

When you first come to the Define Numeric Field Editing display for any numeric field:

- The values shown in the *Text* through *Decimal* fields for that numeric field are the same as shown on the Specify Report Column Formatting display for that same numeric field.
- The sample shows the current editing definition of the field, done with the largest positive value (all 9s) that the field can hold. The sample also shows how the number will appear when it is edited according to the currently selected numeric field definition (option 1 through 4 specified in the *Edit option* prompt).
- If an error occurs while the number in the field is being edited, the sample is edited using the J edit code, and an error message is shown along with the edited sample.
- The *Edit option* value is: the value last specified in the query definition, the value associated with the field definition in the file definition (if this is a field from a file), or 1, if neither of the first two indicates its value.

Generally, when you first come to the other four numeric field editing displays (identified on the *Edit option* prompt of the Define Numeric Field Editing display), the displayed values are taken from: the previously saved values in your query definition, from the field definition in the file, and from the system-supplied default values (in that order). Query uses edit code J as the default for edit option 3 and blank edit words for edit option 4.

## Describing Numeric Field Editing

If you have determined that letting Query do the editing for you will not give you the results you want, you can specify your own editing attributes. You do this on the Describe Numeric Field Editing display.

Describe Numeric Field Editing

Field . . . . . :

Type choices, press Enter.

Decimal point . . . . .	_	1=. 2=, 3=: 4=\$ 5=None
Thousands separator . . . . .	_	1=. 2=, 3=' 4=Blank 5=None
Show negative sign . . . . .	_	Y=Yes, N=No
Left negative sign . . . . .	_____	
Right negative sign . . . . .	_____	
Show currency symbol . . . . .	_	Y=Yes, N=No
Left currency symbol . . . . .	_____	
Right currency symbol . . . . .	_____	
Print zero value . . . . .	_	Y=Yes, N=No
Replace leading zeros . . . . .	_	Y=Yes, N=No
Replace with . . . . .	_	1=Blanks
		2=Asterisks
		3=Floating currency symbol
Single leading zero . . . . .	_	Y=Yes, N=No

F3=Exit
F5=Report
F12=Previous

F13=Layout
F16=Remove edit
F18=Files

This display allows you to specify the editing characteristics that you want used for a numeric field; the editing determines how the values for the field are to appear in your query report (if the report is run when the edit option for the field is 1). You can select the characters to be used for the: decimal point, thousands separator, a negative sign(s), and a currency symbol(s). You can specify separate negative sign characters and separate currency symbol characters for either side of the field's data values. You can also specify whether zero values are to be printed and how leading zeros are to be handled.

This display shows the name of the numeric field to be edited and the numeric field editing override and default values that will be used in the report. The editing values shown could be from IDDU or a system-supplied edit description.

If you blank out *all* the values in the prompts on this display and press Enter, all the values are then set to the system-supplied default values that are assumed by Query. These values are the same default values used for result fields when they are first defined; thus, using this method, you can specify the same type of editing for fields from files as is used for result fields, providing consistent editing in your report.

To remove all editing overrides for this numeric field, press F16 (Remove edit). The asterisk (\*) is removed from the *Edit* column on the Specify Report Column Formatting display, and the editing values that will be used for this field in the query report are taken from the field definition or from the system-supplied default values.

**Decimal point:** Type the option number of the character that you want used as the decimal point in this field. The option numbers and characters are shown below, along with examples of the edited results for a numeric value of 245.87:

Option	Example	Meaning of Option
1= .	245.87	Decimal point is a period
2= ,	245,87	Decimal point is a comma
3= :	245:87	Decimal point is a colon
4= \$	245\$87	Decimal point is a dollar sign
5=None	24587	Decimal point not used

**Thousands separator:** Type the option number of the character that you want used as the thousands separator in this field. The option numbers and characters are shown below, along with examples of the edited results for a value of 1515109:

Option	Example	Meaning of Option
1= .	1.515.109	Separator is a period
2= ,	1,515,109	Separator is a comma
3= '	1'515'109	Separator is an apostrophe
4=Blank	1 515 109	Separator is a blank space
5=None	1515109	Separator not used

**Show negative sign:** Type a Y or N to indicate whether a negative sign is to be used with this field.

**Y=Yes**

A negative sign is to be shown when the value in the field is negative. The sign can be on the left or right side of the value (or on both sides), and it can be defined differently for each side. All negative signs take space in the report. Use the next two prompts to define from one to six characters for the negative sign(s). (You can leave one prompt blank. If you do, no sign will show on that side of the field and no space is taken in the report.)

**N=No**

A negative sign is not to be shown when the value in the field is negative. If the next two prompts contain negative sign definitions, they will be saved in this query but not used.

**Left negative sign:** Type from one to six characters that you want used as the negative sign to appear on the left of negative values in this field. Any printable or displayable character can be used. Either the blank or underscore ( ) can be used within the character string, but if you want blanks at the *right end* of the string for the negative sign, you must use underscores.

Some examples of left negative signs for the negative value of 27.03 are:

Sign	Edited Negative Value
-	-27.03
CRAMT	CRAMT27.03
CR AMT	CR AMT27.03
CRDT:_	CRDT: 27.03

The coding for the last example must include an underscore because of the blank at the right end of the left negative sign characters.

The position of the left negative sign depends on the value specified in the *Replace with* option when leading zeros are to be replaced.

- If you specify option 1 (Blanks) or option 2 (Asterisks), the negative sign is fixed; it is always shown in the leftmost position of the field, to the left of all the asterisks that replace all leading zeros. For example, in a field with a length of eight digits, the edited value for 27.03 would be -\*\*\*\*27.03 or — 27.03.
- If you specify option 3 (Floating currency symbol), then the negative sign moves (or floats), depending on how many leading zeros it replaces, so that it is to the immediate left of the first significant digit in the value (such as -27.03), or it is to the immediate left of the left currency symbol (such as -\$27.03).



**Right negative sign:** Type from one to six characters that you want used as the negative sign to appear on the right of negative values in this field. Any printable or displayable character can be used. Either the blank or underscore ( ) can be used within the character string, but if you want blanks at the *right end* of the string for the negative sign, you must use underscores. Examples of right negative signs are 27.03—, 27.03CR AMT, and 27.03 CRDT.

**Show currency symbol:** Type a Y or N to indicate whether a currency symbol is to be used with this field.

**Y = Yes**

A currency symbol is to be shown with the value in the field. The symbol can be on the left or right side of the value (or on both sides), and it can be defined differently for each side. If option 3 (Floating currency symbol) is not specified below in the *Replace with* prompt (for leading zeros), then the left currency symbol (if used) appears in a fixed position in the field. However, if option 3 is used, then *any* left currency symbol specified will be a floating symbol, depending on how many leading zeros it replaces. Use the next two prompts to define from one to six characters for the currency symbol.

**N = No**

A currency symbol is not to be shown with the value in the field. If the next two prompts contain currency symbol definitions, they will be saved in this query but not used.

**Left currency symbol:** Type from one to six characters that you want used as the currency symbol to appear on the left of values in this field. Any printable or displayable character can be used, but you should not use an asterisk (\*), zero, or whatever your decimal point is (such as the period). Either the blank or underscore ( ) can be used within the character string, but if you want blanks at the *right end* of the string for the symbol, you must use underscores.

Some examples of left currency symbols that might be used with a value of 45.5 are:

Symbol	Edited Result	Possible Usage
L.	L.45.5	Italy
Kr	Kr45.5	Norway
\$	\$45.5	U.S.
THOUS_	THOUS 45.5	U.S.

This string is positioned in the same way as you typed it, unless you choose to replace the leading zeros with the floating currency symbol. In that case, this string is moved (floats) to the immediate left of the first significant digit.

**Right currency symbol:** Type from one to six characters that you want used as the currency symbol to appear on the right of values in this field. Any printable or displayable character can be used, but you should not use an asterisk (\*), zero, or whatever your decimal point is (such as the period). Either the blank or underscore ( ) can be used within the character string, but if you want blanks at the *right end* of the string for the symbol, you must use underscores.

Some examples of right currency symbols that might be used with a value of 123.45 are:

Symbol	Edited Result	Possible Usage
BF	123,45 BF	Belgium
F	123,45 F	France
\$	123.45\$	U.S.
THOUS	123.45THOUS	U.S.
¢	123.45¢	U.S.

The right currency symbol is always in a fixed position.

**Print zero value:** Type a Y or N to indicate, when this field contains a numeric value of zero, whether it is to show a zero or it is to be left blank.

**Y = Yes**

A numeric value of 0, when it occurs, is to be shown.

**N = No**

A numeric value of 0 is to be shown as all blanks; no 0 is to be shown in this field.

**Replace leading zeros:** Type a Y or N to indicate, when this field contains leading zeros, whether they are to be replaced by different characters or not. Leading zeros are those zeros that appear to the immediate left of the first significant digit (1 through 9) in the numeric value, or to the immediate left of the decimal point if the numeric value is less than 1. For example, there are four leading zeros in the eight-digit field 000027.03, and there are six in the eight-digit field 000000.03.

**Y = Yes**

Leading zeros are to be replaced by other characters (blanks or asterisks) or by a floating currency symbol.

**N = No**

All leading zeros are to be shown. (If the *Replace leading zeros* and *Replace with prompts* contain values, they will be saved in this query but not used.)

**Replace with:** If you typed a Y for the *Replace leading zeros* prompt, type the option number of the character or symbol that you want used to replace any leading zeros in the values for this field.

**1 = Blanks**

Blank spaces are to be used to replace leading zeros ( 27.03 and .03).

**2 = Asterisks**

Asterisks (\*) are to be used to replace leading zeros (\*\*\*\*27.03 and \*\*\*\*\*.03).

**3 = Floating currency symbol**

The currency symbol is to be used to replace leading zeros. The symbol floats so that it appears to the immediate left of the first significant digit in the numeric value (for example, \$27.03 and \$.03).

**Single leading zero:** Type a Y or N to indicate, when the numeric value in this field is less than 1, whether a single leading zero is to be shown to the left of the decimal point. This prompt value is used only if a Y is specified for the *Replace leading zeros* prompt.

**Y = Yes**

A single leading zero is to be placed to the left of the decimal point when the value is less than 1, assuming that the length is greater than the number of decimal positions (for example, 0.03 for a result of 3/100).

N=No

No zero is to appear to the left of the decimal point when the value is less than 1 (for example, .03 for a result of 3/100).

## Describing Date/Time Field Editing Display

If you have selected numeric fields for your query that contain date or time values Query provides an easy way to specify or change the separator character that will be used in the editing process.

The Describe Date/Time Field Editing display allows you to specify the type of separator character that you want used for a numeric field that contains a date or time value. The editing value determines how the values for the date or time field are to appear in your query report (if you use option 2 as the edit option for this field).

Describe Date/Time Field Editing

Field . . . . . :

Type choice, press Enter.

Date/time separator . . . . .    1=.    2=/    3=:    4=-    5=,

F3=Exit  
F13=Layout

F5=Report  
F16=Remove edit

F12=Previous  
F18=Files

When you first see this display, the edit value shown is the value previously saved in your query, is from the field definition in the file description, or is the system-supplied default.

You can either change the edit value shown, or you can blank it out. If you blank out the value, the system-supplied default separator value (stored in the QDATSEP system value) is to be used, and it is shown if you return to this display. To use this date/time edit value to edit the field, edit option 2 must be specified on the Define Numeric Field Editing display.

Any number less than six digits long will lose one date/time position on the left for each digit that it is short; zero values will become blanks.

Only the last six digits of a numeric field are displayed when you use date/time editing (for example, if your date/time separator is a slash, the value 942100863 becomes 10/08/63).

**Date/time separator:** Type the option number of the character that you want used as the date or time separator in this field. The option numbers and characters are shown below, along with examples of the edited results for a value of 100863:



-- Value in QDECFMT System Value: --					
Edit Code	Print Commas	Negative Symbol	Blank Value	I Value	J Value
1	Yes	None	.00 or 0	,00 or 0	0,00 or 0
2	Yes	None	Blanks	Blanks	Blanks
3	No	None	.00 or 0	,00 or 0	0,00 or 0
4	No	None	Blanks	Blanks	Blanks
A	Yes	CR	.00 or 0	,00 or 0	0,00 or 0
B	Yes	CR	Blanks	Blanks	Blanks
C	No	CR	.00 or 0	,00 or 0	0,00 or 0
D	No	CR	Blanks	Blanks	Blanks
J	Yes	-	.00 or 0	,00 or 0	0,00 or 0
K	Yes	-	Blanks	Blanks	Blanks
L	No	-	.00 or 0	,00 or 0	0,00 or 0
M	No	-	Blanks	Blanks	Blanks

**Note:** For all these edit codes, *decimal points* are always shown, and *leading zeros* are always suppressed.

Query uses the J edit code as the default edit code whenever an error occurs during numeric field editing or whenever there are no other editing values to use. If an error occurs, an error message is shown along with the edited result produced using the J code.

For a field that does not have an edit code specified in its definition, edit code J is shown as the default the first time you see this display for that field.

The other edit codes and edit descriptions are:

- **Edit code X** shows the values in their unedited form; for example, a value of -12 is shown as 1K.
- **Edit code Y** suppresses the leftmost zero of a date field that is three to six digits long, and it suppresses the two leftmost zeros of a date field that is seven digits long. It also inserts slashes (/) between the month, day, and year. The positions of the slashes depend on the number of digits in the field: nn/n, nn/nn, nn/nn/n, nn/nn/nn, and nnn/nn/nn.
- **Edit code Z** removes any plus or minus sign from a numeric field, and suppresses leading zeros.
- **Edit descriptions 5 through 9** are user-defined edit codes. They can be defined to use other characters or combinations of characters to edit a numeric field.

For *all* of these edit codes and edit descriptions, the negative sign is always on the right of the value.

You must either specify an edit code here or press F12 to return to the Define Numeric Field Editing display. (You can then specify, for example, option 4 in *Edit option* and then define your own edit words on the Specify Edit Word display.)

- The only currency symbol that can be used with any of these edit codes is the one defined in the system-supplied system value QCURSYM.
- If date/time edit code Y is specified for a field, the field must be 3 to 7 digits long.

- If the definition of an edit code is changed (done outside of Query), the changes are reflected in all query reports that use that edit code.
- For more information about using edit codes and user-defined edit descriptions, see the *DDS Reference* or the *Data Management Guide*.

**Optional edit code modifier:** Type the character that you want used as the optional modifier for the specified edit code. If you specified one of the edit codes X through Z or one of the edit descriptions 5 through 9 in the *Edit code* prompt, you cannot specify an optional modifier in this prompt.

**1 = Asterisk fill**

Asterisks (\*) are to be used as the fill character to replace leading zeros for this field; for example, \*\*\*\*27.03.

**2 = Floating currency symbol**

The currency symbol specified in the QCURSYM system value is to be used as the edit code modifier for this field. An example is the dollar sign (\$), as in \$27.03.

## Specifying Edit Words

Specifying or creating an edit word is another way to define numeric editing. It should be considered when the first three are unable to produce the results you want.

The Specify Edit Word display allows you to specify or change the edit word(s) that you want used to edit a numeric field. An edit word determines how all the values for the specified field are to appear in your query report if the report is run when the edit option for this field is 4.

You can use one edit word to edit all the *detailed values* for the field and, if the total summary function was specified for the field, you can use another edit word to edit the *summary total values* for the field.

A quoted blank string appears as the default for the detailed values edit word for a field that does not have an edit word specified in its definition.

To remove only the edit word used for this field's summary totals, blank out the *Edit word for summary total* prompt. If you want to remove *both* edit words defined for this field, press F16 (Remove edit). Note that F16 removes all editing values defined in *all* four edit options, not just this option.

For the *Edit word* prompt, either you must specify an edit word or you must press F12 to return to the Define Numeric Field Editing display. You *cannot* leave the *Edit Word* prompt blank.

If an error occurs while a field is being edited by Query, the field is edited with the J edit code, and the field value is displayed in its edited form along with an error message.

**Edit word:** Type the character string that you want used as the edit word for this field. The character string must be enclosed in quotes and must have a blank position for each digit in the field, as determined by the length field shown at the top of the display. To specify a blank space in the report result, use an ampersand (&).

Specify Edit Word

Field . . . . . :	Heading 1 . . . . . :
Length . . . . . :	Heading 2 . . . . . :
Decimal . . . . . :	Heading 3 . . . . . :

Type information, press Enter. (Put quotes around edit words.)  
 (Each blank replaced by a digit, each '&' with a blank.)

Edit word . . . . . ' , , 0. -'

(These are SAMPLES ONLY; they are NOT defaults)

Edit word for  
 summary total . . . . . ' , , , 0. -'

F3=Exit	F5=Report	F12=Previous
F13=Layout	F16=Remove edit	F18=Files

For example, if you want to define an edit word containing an 8-digit field with no decimal positions, and you want commas for thousands separators, and CR for negative values, your edit word would be ' , , , &CR' and a value in the report would appear as 27,345,838,789 CR if it were a negative value.

You might define '( ) - ' as the edit word for a 10-digit telephone number, such as (507) 987-6543. The edit word might be ' - - ' for a 9-digit social security number, such as '123-45-6789'.

Consider the following as you define your edit words:

- If option 1 (Total) was or will be specified on the Select Report Summary Functions display to get summary totals for the field, the J edit code is used to edit the field if you do not define an edit word in the *Edit word for summary total* prompt.
- The edit word for summary function totals, if used, must have three more blank positions than the field length indicates, but its length cannot exceed 31 digit positions. The editing positions containing commas for thousands separators or a period for the decimal point, for example, are in addition to the 31 maximum.
- When an edit word is used, its length is considered by Query in determining the column width used in the report for that field. If the summary total edit word is defined, but no summary total is defined for this field, for example, then the length of the summary total edit word is ignored in determining the column width for detailed output.
- If both edit words are defined and used, they are assumed to both be aligned on the right with the last character in each string. If they are not aligned, the ampersand (&) can be used to add blanks to one of the edit word character strings so that they are aligned.
- If the widest edit word to be used is narrower than the column headings, the column headings are centered over it. Otherwise, the rightmost position of the column headings is aligned with the rightmost position of the edit word.

- If you want a single apostrophe to appear in the edited result, use two single apostrophes ( ' ' ) in the edit word.
- An edit word does *not* have to have a decimal digit position (to the right of the decimal point) for each decimal digit in the field; only the total length is significant. Query does not check the two edit words to see that they have the same number of decimal positions.
- Only the system-defined currency symbol (stored in the QCURSYM system value), can be used as a *floating* currency symbol. Any other symbol specified will not float; it stays fixed in one position.
- If the length of the field or its decimal positions value changes, the edit words may no longer be suitable. In this case, Query uses the J edit code to edit the field value when necessary.

Other rules for edit words and control characters are described in the *DDS Reference* and the *Data Management Guide*.

**Edit word for summary total:** If option 1 (Total) was specified on the Select Report Summary Functions display to get summary totals for this field, you must type the character string that you want used as the summary total edit word for this field. The character string must be enclosed in quotes and must have a blank position for each digit in the field, plus three more than the length of the field shown at the top of the display, up to a maximum of 31 positions. To specify a blank space in the report result, use an ampersand (&).

For example, if you want to define an edit word long enough for the total values for an 8-digit field with no decimal positions, and you want commas for thousands separators, and CR for negative values, your edit word would be ' , , , &CR ' and a value in the report would appear as 27,345,838,789 CR if it were a negative value.

If you do not specify an edit word here and you specify on the Select Report Summary Functions display that the field be totaled, the J edit code is used to edit summary totals for the field.



## Chapter 11. Specifying Report Summary Functions

This chapter describes how to specify the summary functions for each of the selected fields in your query output. Depending on the type of field, you can specify one or more (or all) of the types of summary functions for each field in your report: total, average, minimum value, maximum value, and count. All of them can be used for numeric fields, and all *except* total and average can be used for character fields.

For each field for which you specify summary functions, Query calculates *summary values* and includes them in the report. Query calculates these summary values at each report break (break levels 1 through 6) defined in this query and at the end of the report (break level 0). Each type of summary is shown on a separate line in the report, with a descriptive abbreviation shown on the left of the summary values (see Chapter 12, “Defining Report Breaks”).

For example, assume that your query has a numeric result field named ITEMTOT defined using the expression QUANTITY \* ITEMCOST (two numeric fields being multiplied together). These two fields are used to calculate the cost of each item ordered in the ITEM field. You might define the following summary functions for those fields: *count* for the ITEM field, *total* and *maximum* for the QUANTITY field, *maximum* for the ITEMCOST field, and *total* and *maximum* for the ITEMTOT field. The following is an example of how part of a report might look for a customer named Z Z Smith:

ITEM	QUANTITY	ITEMCOST	ITEMTOT
Bolt	12	.10	1.20
Hammer	2	8.50	17.00
Ruler	1	2.00	2.00
Screw	6	.05	.30
Totals for: Z Z Smith			
TOTAL	21		20.50
MAX	12	8.50	17.00
COUNT 4			

Each summary function result for each field (column) is calculated and included as a summary value (similar to a subtotal) at every defined report break and as a final summary (final total) at the end of the report. (However, using the Define Report Break display, you can format a particular break level to suppress the summary information. In this case, when a break occurs, a blank line and possibly break text that includes break values, if defined, is used.)

Summary function results, if defined, can appear in all three types (displayed, printed, and data base) and both forms (detailed and summary) of output, with one exception: they cannot be included if the report is to a data base file in detailed form.

## Types of Summary Functions

On the Select Report Summary Functions display, you can enter the number of one or more of the following options to specify the types of summary functions to be used for the fields. You can specify as many options for as many fields as you want, if they are valid for that type of field. If you type more than one option for a field, they can be typed in any order. The order that the summaries appear in the report, however, is the same as listed here, and cannot be changed.

### 1= Total

Shows the sum of the values in the field for the break level or for the whole column (numeric fields only).

### 2= Average

Shows the average of the values in the field for the break level or for the whole column (numeric fields only). The average is the total divided by the count (number of records).

### 3= Minimum

Shows the lowest character or numeric value in the field for the break level or for the whole column.

### 4= Maximum

Shows the highest character or numeric value in the field for the break level or for the whole column.

### 5= Count

Shows the total number of records for each break level or for the whole report.

When summary values are being calculated for the total, average, minimum, and maximum summary functions, the original length and decimal position values (in the field definition) are used for the field calculations, not the values specified for the field (if any) in the *Len* and *Dec* column of the Specify Report Column Formatting display. Also, rounding or truncation is done in these calculations, depending on what you specify on the Specify Processing Options display (see Chapter 14, “Specifying Processing Options”).

Select Report Summary Functions

Type options, press Enter.

1=Total   2=Average   3=Minimum   4=Maximum   5=Count

---Options---	Field
5   _   _   _   _	ITEM
1   4   _   _   _	QUANTITY
4   _   _   _   _	ITEMCOST
1   4   _   _   _	ITEMTOT

Bottom

F3=Exit  
F12=Previous

F5=Report  
F13=Layout

F11=Display text  
F18=Files

This display shows all the fields (including result fields) that are available to be used in your report. The fields are listed in the order that they will be shown in the report. If fields *were* selected on the Select and Sequence Fields display, they are shown in the list on this display in the order that they were specified (includes result fields). If fields were *not* selected on the Select and Sequence Fields display, all the fields in the query are shown here in the following order:

1. All sort fields (if any) in their order of sort priority.
2. Any result fields not selected as sort fields.
3. All other fields not selected, in the order they exist in the record format definitions used in the selected files. Unselected fields from the first file are listed first, followed by those in the second file, and so on.

Summary functions can be specified for as many of these fields as you want, as long as that type of function is valid for that type of field.

---

## Summarizing Columns

The collating sequence that you select (see Chapter 9, “Selecting a Collating Sequence”) for your query will have an affect on different parts of your query definition. If you choose the *minimum* or *maximum* option for one or more of the character fields in your query, the selected collating sequence will be used to establish the values that will appear on your report. In some cases, blanks would be the minimum or maximum value (if a record did not contain any data in that field) and would be used for your query output.

---

## Location of Column Summary Values

In a report that lists the detail information from the query, summary values are shown directly below the column(s) for which they are specified, at the end of the report, and/or after each report break. In a report that lists summary information only, summary values are shown directly below the column headings after any line of break fields for report breaks. Specifying whether you want detail or summary information is described in Chapter 13, “Selecting Output Type and Output Form.”

Each type of summary is shown on a separate line. The descriptive abbreviation (TOTAL, AVG, MIN, MAX, or COUNT) for each summary is placed to the left of the summary value, and is separated from the value by at least one space. (You cannot change the placement of this information or the order in which the summaries are shown.)

For example, if you have a result field of TOTDUE for which you want a total and maximum value to show on the report, and you want a count of all records in the report, your report would look something like this:

Accounts Receivable Summary		
NAME		TOTAL DUE
Jones	B D	5.00
Kagy	R L	25.39
Vine	S S	.00
Johnson	J A	140.28
Alison	J S	36.36
Henning	G K	1,900.50
Stevens	K L	6.90
Wilson	T N	15.00
Doe	J W	.00
FINAL TOTALS		
TOTAL		2,129.43
MAX		1,900.50
COUNT		9

Each TOTAL, AVG, MIN, and MAX value is edited in the same way as the column in which it appears.

## Chapter 12. Defining Report Breaks

This chapter describes how you define the report breaks that you want to occur in your query report. Report breaks are used to break the report into groups of records (or lines) each time the value of a report break field changes. The second part of this chapter describes how, for each of your report breaks, you can control report break formatting and define “break text” messages.

The primary reason for defining report breaks is to provide a basis (along with your selected sort fields) for Query to create a set of subtotals for each logical group of records in your output. An example of a logical group of records would be all of the time records for one employee. Another example would be all of the employee records for an entire department. A third example would be all of the sales activity records for one inventory item.

If daily time records existed for each employee, at the end of a pay period you could have Query process all of the records and create two kinds of groups or subtotals. To accomplish this you would have to define two report break fields (DEPTNO and EMPNO, for example) and select the same two fields as sort fields. If you assigned a sort priority of 10 to DEPTNO and a sort priority of 20 to EMPNO, Query would arrange the records in groups so that they would appear on your report by employee number within department number (starting with the lowest number employee’s records in the first or lowest department number, followed by the rest in ascending sequence).

If you also defined break level 1 as DEPTNO and break level 2 as EMPNO, Query would create group or level breaks and would print or display subtotals for each group based on what you specified for your Report Summary functions (see Chapter 11, “Specifying Report Summary Functions” for details). If you only wanted final totals at the end of the report, you would not have to define any report breaks in this example.

When a report break occurs for each group of records selected by the query, break text (if any) is shown following a blank line. The break text is then followed by a separate line for each type of summary function being used in your query. On each summary function line is the name of the function and all the summary values calculated at that report break for all the fields using that function.

---

### Defining a Report Break

On the Define Report Breaks display, you select each field that you want used as a break field and you assign to it the break level you want it to control. You can define as many as six break levels (numbered 1 through 6) and you can specify multiple break fields to control any break level, as long as you assign no more than nine break fields for all the break levels used.

For example, you can have: only one break level with all nine fields defined as break fields for it; three break levels with three break fields each; or a maximum of six break levels, with one field each used as break fields for five of the levels and four fields used for one level.

If multiple break fields are defined for the same break level, a change in any one of those break fields causes a break (or group change) level to occur for the specified

break level number. This break level change causes Query to include the appropriate summary values in your output.

A break at one level automatically causes a break at all lower break levels (the lowest level has the highest number). For example, if all six break levels were defined, a control break occurring at level 4 would also force breaks at levels 5 and 6, and the break text and summary values for each of those three levels (6 to 4) would be included at that point in the report.

Define Report Breaks

Type break level (1-6) beside up to 9 field names, press Enter.  
(Use as many fields as needed for each break level.)

Break Level	Sort Prty	Field
1	1	COMPANY
2	2	DIVISION
3	3	REGION
4	4	DEPARTMENT
5	5	EMPLOYEE

Bottom

F3=Exit  
F12=Previous

F5=Report  
F13=Layout

F11=Display text  
F18=Files

An example of when you might need to define five report break levels, would be if you sequenced a group of payroll time records by employee within department, within region, within division, and within company. In this case you would assign the following break levels:

- Break level 1 = company
- Break level 2 = division
- Break level 3 = region
- Break level 4 = department
- Break level 5 = employee

You can use any field shown in the list to define a report break; however, in most cases, you should use only sort fields for break fields. Generally, the break levels should be in the same order as the sort priorities assigned to the fields. That is, the highest assignable break level (level 1) should be assigned to a high sort priority number (where 1 is also the highest), break level 2 should be assigned to some lower priority number, and the lowest break level used should be assigned to the lower sort priority numbers.

If you specify a field as a break field that is not also a sort field, you may get extra report breaks in your report because, if the field is not part of the sorting step, records that belong in the same group may not be grouped together and will cause the extra breaks.

One or more of the following appears at each report break:

- A blank line to separate the summary information from the column data.

- Any break text defined for that break level, including any break values that are defined in that text.
- Any summaries (totals, averages, minimum and maximum values, and counts) that you specified on the Select Report Summary Functions display.
- Another blank line, or if the report is printed, you can specify for any break level that a new page be started after the summary information is printed.

In a name and address file, for example, you might specify that two fields named CITY and STATE be specified as break fields. If STATE was defined as the break field for break level 1, CITY was defined as the break field for break level 2, and both fields were specified as break values in break text for their respective levels, then the following sample report breaks and break text might appear in a report for the following records:

Records in file:			Lines in report:		
LNAME	CITY	STATE	STATE	CITY	LNAME
Brown	Rochester	MN	MN	Rochester	Brown
Jones	Rochester	MN			Jones
Smith	Rochester	MN			Smith
.	.	.	Users in Rochester MN		
.	.	.	Count		3
.	.	.	St Paul		
Adams	St Paul	MN			Adams
.	.	.	Users in St Paul MN		
.	.	.	Count		1
.	.	.	All Users in MN		
.	.	.	Count		4
.	.	.	NY Rochester		
Calva	Rochester	NY	NY	Rochester	Calva
Doe	Rochester	NY			Doe
Smith	Rochester	NY			Smith
.	.	.	Users in Rochester NY		
.	.	.	Count		3
.	.	.	All Users in NY		
.	.	.	Count		3

If you do not specify report breaks, Query prints or displays all the records in the report, one after the other without any additional spacing or text. Summaries are done at the end of the report only, with no summary subtotals for groups of records.

Break level 0 is another level, provided by Query, that you can use. This break level, which occurs only at the end of the report, is used to print the final summary values for all the specified summary functions at the end of the report.

Break level 0 has default break text (Final Totals), but it can be changed or blanked out if you do not want any final total description or values.

For printed output only, Query suppresses the printing of identical field information within a field that is defined as a break field. That is, when the contents of a break field is the same in a group of records, only the first record in the group has that field printed; all the other records in the group do not print the duplicate contents of that field.

See the previous “name and address file” example. You will notice that even though each record contains a value for the STATE field, the value for STATE only appears in its column when the value changes.

However, for the first record at the top of every page, *all* the information in all report fields is printed again for ease of reading.

Query assumes you want a blank line after any summaries, unless you specify a new page. If you display the information rather than print it, Query ignores new page requests.

You can exclude break fields from showing in the report in column format and still use their values in the report’s break text. That is, if you specify a 0 in the *Len* column of the Specify Report Column Formatting display for a field, no column of data for the field appears in the report. But you can still specify that the field be used as a break field so that its value, when a report break occurs, is included in the break text defined for that level of report break.

The following are additional considerations regarding the occurrence of report breaks:

- For character fields, depending on the collating sequence used, a report break may not actually occur even though the characters in a field may be different. If, for example, the collating sequence treats each uppercase and lowercase letter as having the same value (Aa, Bb, Cc, and so on), then no report break occurs if the only change in a field is from A to a, for example. (Collating sequences are not used for DBCS fields.)
- For numeric fields, the actual data in the fields is used for determining report breaks, not the edited form of the data.
- For both character and numeric fields, the original definition size of each field is used for determining report breaks, not any changed size that may have been specified on the Specify Report Column Formatting display.

---

## Defining Report Break Formatting

The Format Report Break display is used to format each of the break levels (1 through 6) that you defined on the Define Report Break display. This display is shown once for each of the break levels that you defined for your query. You can also specify some formatting characteristics for break level 0, which is the ‘Final Totals’ break level provided by Query. You can think of break level 0 as the group that includes all of the selected records.

For all break levels except break level 0, you can specify whether the report is to skip to a new page after a particular report break occurs. For each break level (1 through 6), you can also specify whether the summary function values are to be suppressed. You can also specify the break text (if any) that you want included with (or instead of) any summary information. The break text appears after the column data, on the line before any summary values.



Format Report Break			
Break level . . . . .		1	
Type choices, press Enter. (Put &field in text to have break values inserted.)			
Skip to new page . . . . .		N	Y=Yes, N=No
Suppress summaries . . . . .		N	Y=Yes, N=No
Break text . . . . .		Company	
Level	Field	Level	Field
1	COMPANY	4	DEPARTMENT
2	DIVISION	5	EMPLOYEE
3	REGION		
F3=Exit		F5=Report	F12=Previous
F13=Layout		F18=Files	

**Skip to new page:** Type a Y or N to specify, for this break level, whether printing is to start on a new page after a report break occurs for this break level. The summary information or break text, if any, for this break level is printed before skipping to the next page occurs.

This prompt applies to printed reports only and is ignored for displayed reports. For break level 0, this prompt is *not shown*.

**Y = Yes**

Query is to skip to a new page after any summary values are printed on the current page for each report break that occurs for this break level.

**N = No**

Query is not to skip to a new page when a report break occurs for this break level. Instead, it is to skip the number of lines you specify on the Define Printer Output display plus one additional line. (see Chapter 13, "Selecting Output Type and Output Form").

**Suppress summaries:** Type a Y or N to specify, for this break level, whether summary values (if any summary functions were selected) are to be suppressed. You can suppress summaries for all three types of output. You may want to exclude summary values for level 0 (Final Totals) if they are not needed.

**N = No**

Any summary values are not to be suppressed; they are to be included each time that a report break occurs at this break level.

**Y = Yes**

All summary values are to be suppressed; they are *not* to be included for this break level.

**Break text:** Type any text that you want to appear at each report break for this break level. The text can be as long as 40 characters. The text appears ahead of any summary lines for this report break.

If you include &XXXXXX (where XXXXXX is any one of the selected fields in your query) in the text, the current value of the field appears in place of &XXXXXX in the text in the report. For example, if you entered break text of:

Totals for &CITY &STATE

you might get:

Totals for Glendale CA

If you entered break text of:

&FINIT&MINIT &LNAME

you might get:

JY Clarke

Notice that a blank should follow a field name. An exception is that a second field name can follow a field name. As shown in the second example, the middle initial field, &MINIT, follows the first initial field, &FINIT, with no blank between them. The characters /, -, or : may also follow a field name. You can also type characters directly in front of a field name.

The field names can be uppercase, lowercase, or a mixture: &LNAME, &lname, or &Lname.

Blanks at the end of character field values, such as 'Glendale', are dropped. Blanks in front of numeric field values are also dropped. Any editing specified for numeric fields is applied, and any changed lengths (except 0) specified on the Specify Report Column Formatting display are used. However, if 0 was specified for a field (to exclude the field from the report in column form), then the originally defined length and decimal position values are used in the break text.

Query prints only part of the text if the width is not large enough on a printed report. However, field value substitutions in the break text are either wholly included or excluded; if there is not enough room left to print all of a value, none of it is printed.

To suppress summaries for break level 0 and prevent the 'Final Totals' line from appearing in the report, you must answer Y (Yes) to the *Suppress summaries* prompt and you must blank out the text in the prompt for break level 0.

## Chapter 13. Selecting Output Type and Output Form

This chapter describes how you select where you want your query output to go, and in what form you want it to be. You can have the output displayed, printed, or put into a data base file. You can also specify that the output is to be in detailed form (which includes all of your selected records) or in summary form (which only includes report break data as described in Chapter 12, “Defining Report Breaks”).

If you do not use this definition step in defining your query, the output produced by Query is shown on your display and is in detailed form.

If you specify that your output is to be printed or stored in a data base file, Query will present additional displays so that you can define printer or data base file characteristics.

---

### Selecting the Output Type and Form You Want

You can select the output device for your query by entering one of the following choices:

#### 1 = Display

The output of your query is to be shown on your display, and it can be shown in detailed or summary form. The output is the same as that produced by F5 (Report) during query definition. For information on how to use the Display Report display, you can press the Help key while you are displaying your query output.

#### 2 = Printer

The output of your query is to be printed, and it can be printed in detailed or summary form. If you select this option, the Define Printer Output display is shown when you press Enter. There, you can specify the printer to be used and other characteristics of the printed output. Other displays related to the printed output are also shown.

#### 3 = Data base file

The output of your query is to be put into a data base file. If you select this option, the Define Data Base File Output display is shown when you press Enter. There, you can specify the name of the file and member to be used to store the output and whether the output is to be added to the file or member or is to replace existing data in the file or member.

Both the detailed and summary forms of data base file output are different from displayed or printed output:

- For *detailed* output to data base, report break and summary function output (if defined in the query) is ignored; only the selected records are put in the data base file. Also, if you specify that output is to a data base file, the values in the line wrapping prompts are ignored; data base output records are never wrapped.
- For *summary* output to data base, Query outputs a record for each defined report break including one for break level zero (0).

Note that data base output does not contain certain report characteristics that are used for displayed or printed reports: column headings, column spacing, line wrapping, a cover page, or page headings or footings. Even though these char-

acteristics may be defined in the query, they are not used unless your *Output type* choice specifies either displayed or printed output. (Because the query definition can contain definitions for all three types of output at the same time, you have the flexibility to use the same query for more than one type of option. All you have to do is change the option and rerun your query.)

Select Output Type and Output Form

Type choices, press Enter.

Output type . . . . .	1	1=Display 2=Printer 3=Data base file
Form of output . . . . .	1	1=Detail 2=Summary only
Line wrapping . . . . .	N	Y=Yes, N=No
Wrapping width . . . .	—	Blank, 1-198
Record on one page . .	—	Y=Yes, N=No

F3=Exit

F13=Layout

F5=Report

F18=Files

F12=Previous

**Form of output:** Type the number of one of the following choices to select the form of output you want for your query. You can specify that the output for the report is to be produced in detailed form or in summary form. The detailed form includes all the records selected in the query and any summary information that was defined. Summary information consists of report breaks, totals, averages, maximums, minimums, or counts.

#### 1 = Detail

For displayed and printed output, the report is to contain both the selected data records and all summary information. For data base file output, only the selected records are put into the file; summary information is not.

#### 2 = Summary only

The report is to contain only the summary information provided at report breaks and at the end of the report (final totals).

**Line wrapping:** Type a Y or N to indicate whether lines of the report are to be wrapped whenever all the fields in the output record cannot fit on one line in the report. Line wrapping values are used for displayed and printed output; they are *ignored* when output is to a data base file or is merged into an Office or DisplayWrite 4 text document for printing.

#### Y = Yes

The data for each output record is to be wrapped (continued on the next line of the report) whenever the length of the record exceeds the width of the report. If a field cannot fit on the end of a line, all of that field is carried over to the next line along with any other fields that follow it. And, if the length of a field is longer than the specified wrapping width, the excess length of the field (after it starts on a new line) is:

- Truncated on the right, if it is a character field

- Dropped from the report, if it is a numeric or DBCS field

When line wrapping occurs, Query also wraps the field headings. The results on your report are a line(s) of field headings followed by a line of field data. Then Query follows with a line(s) of fields headings for the wrapped fields followed by a line of wrapped data, and so on.

#### **N=No**

The data for each output record is *not* to be wrapped when the length of the output record exceeds the width of the report line. Instead, any extra length on the right end of each record is truncated. If N is specified, the next two prompts are ignored.

**Wrapping width:** For displayed or printed output only, you can specify a value that indicates the maximum width of the lines in the report. Either type a value of 1 through 198 or leave this prompt blank.

If all of the fields of an output record cannot fit within the specified width of one line of the report, the field that would exceed the specified width is started on the next line. If you leave this prompt blank, wrapping occurs whenever the maximum width of the specified display, or printer is reached.

If you specify too small a width, some column headings, fields, or summary function values may be truncated or dropped from the report. If such a problem occurs, you can either make changes here or to the *Column Spacing* or *Column Heading* prompts on the Specify Report Column Formatting display. To see which fields this may happen to, press the F13 (Layout) function key. Error messages are shown for each field in error.

**Record on one page:** When line wrapping can occur, you can specify whether you want to prevent records from being split across pages of your printed report. Type a Y or N to indicate whether you want all of each record to be on the same page in the report.

#### **Y=Yes**

Each record is to have all its fields kept together on the same page. If there is not enough room left on the current page to contain all of its fields, the complete record is displayed or printed on the next page.

#### **N=No**

Records that start near the end of one page are split as necessary and continued at the top of the next page. The split occurs after the last complete field that fits on the full page, with the rest of the fields in the record continued on the next page.

## **Selecting Output to the Printer**

The Define Printer Output display is the first of several print definition displays that you can use to define where your report is to be printed, and in what manner. This display is used to identify the printer and some of the print characteristics of the forms (paper) used in the printer, including the length and width of the forms, the starting and ending print lines on each page, and the line spacing between each printed record.

Define Printer Output		
Type choices, press Enter.		
Printer device . . . .	_____	*PRINT, name
Form size		
Length . . . . .	___	Blank, 1-255
Width . . . . .	___	Blank, 1-198
Start line . . . . .	___	Blank, 1-255
End line . . . . .	___	Blank, 1-255
Line spacing . . . . .	1	1, 2, 3
Print definition . . .	N	Y=Yes, N=No
F3=Exit              F5=Report              F12=Previous F13=Layout        F18=Files		

You can also specify whether your query definition is to be printed when the report is printed. If it is, the values specified on this display apply to the printing of both the query report and the query definition.

These values do not apply if you print the definition using option 6 on the Work with Queries display (which prints only the definition) or if you specify both data base output and print definition (which puts the report in the file and prints the definition).

**Printer device:** Specifies the printer device to be used to print your query report. If you type \*PRINT in this prompt, the printer currently assigned to your job is used to print the report. If you want to print your report on a different printer, type the name of that printer device to be used.

**Form size:** This set of prompts specifies the length and width of the printer forms that are to be used to print your query report. If you leave these prompts blank, the length and width values used are those specified in the printer device file named QPQUPFIL, which is the only printer device file that Query uses. You cannot override this file with another device file.

#### Form length

Either type a number from 1 through 255 that indicates the number of lines per page that are available on the printer forms to be used, or leave this prompt blank. This length should be the length of the form itself.

#### Form width

Either type a number from 1 through 198 that indicates the number of print positions (characters) per line that are available on the printer forms to be used, or leave this prompt blank. If you specify a width greater than the width of the form, Query produces the report but truncates any information on the right end of the report that exceeds the width of the form.

This does not affect the report width shown on the Display Report display.

If you want to increase the left margin of the report (with the left edge being print position 1), go to the Specify Report Column Formatting display and type

a larger value in the *Column Spacing* prompt for the first field to be shown in the report.

**Start line:** Type a number 1 through 255 that indicates the first line to be printed on each page of your report. Depending on what you have defined elsewhere in this query definition, the first line of page headings, column headings, or the next record is printed on this starting line.

If you leave this prompt blank, the starting line is line 6. If you specify a starting line number, it must be no greater than the ending line value and less than or equal to the form length value.

**End line:** Type a number 1 through 255 that indicates the last line to be printed on each page of your report. Depending on what you have defined elsewhere in this query definition, the page footing or a record (or part of a record, if it is wrapped) is printed on this ending line. If you specify an ending line number, it must be greater than the starting line value and less than or equal to the form length value. If the ending line is greater than the form length, Query prints the report using an ending value equal to the form length value.

If you leave this prompt blank, the value specified in the printer device file (named QPQUPRFL) used by Query determines the ending line number.

**Line spacing:** Type a number (1, 2, or 3) that indicates the kind of line spacing between records that you want used for your report. This value controls the amount of separation (blank lines) between all but wrapped lines, which are always single spaced. A value of 2 or 3 can make the report easier to use if line wrapping is active and required. If you leave this prompt blank, 1 is assumed and a single-spaced report is printed.

- 1 Prints with single-spacing (*no* blank lines between)
- 2 Prints with double-spacing (*one* blank line between)
- 3 Prints with triple-spacing (*two* blank lines between)

**Print definition:** Type a Y or N to indicate whether you want a copy of your query definition to be printed whenever the query report is printed. N (No) is the default.

**Y = Yes**

A copy of the query definition is to be printed along with the query report. The definition is printed immediately ahead of the report.

**N = No**

A copy of the query definition is *not* to be printed when the report is printed.

### Specifying Spooled Output Overrides

The Define Spooled Output display is another print definition display used to continue defining the print characteristics of your query report. You can specify the type of forms (paper) to be used in the printer and the number of copies of your report to be printed. You can also specify the spooling characteristics: whether the output is to be spooled, and whether it is to be held on the output queue to be printed at a later time.

If you specified that both the query report and query definition are to be printed, the values on this display apply to both of them.

Completing this display does not cause the query to immediately run and print a report. You must still use the Exit This Query display (see Chapter 15, “Exiting and Running a Query”).

If you have your query output spooled and if it is necessary to work with your spooled output, you can use the Work with Spooled Files display. (You can get to that display by typing the WRKSPLF command on a command line of any menu.) For more information about spooled output files and printer device files, see the *Data Management Guide*. For information about the values mentioned here with this display, see the description of the CRTPRTF (Create Printer File) command parameters in the *CL Reference* manual.

Define Spooled Output	
Type choices, press Enter.	
Spool the output . . . _	Blank, Y=Yes, N=No
Form type . . . . . _____	Blank, name, *STD
Copies . . . . . _____	Blank, 1-255
Hold . . . . . _	Blank, Y=Yes, N=No
F3=Exit                      F5=Report                      F12=Previous	
F13=Layout                  F18=Files	

**Spool the output:** If you want to specify whether your report is to be spooled (as a spooled printer file) to an output queue, type a Y or N. If the output is spooled, the report can be scheduled for more efficient printing or possibly be delayed until a later time. If you leave this prompt blank, the value specified in the printer device file (named QPQUPR FIL) used by Query determines whether the output is to be spooled.

When your query is run, it creates your report and sends it as a spooled printer file to an output queue. You can specify that either the output be printed as soon as it can be scheduled, or that it be *held* on the output queue until it is released at a later time.

**Y = Yes**

The output for your report is to be spooled and sent to an output queue. When the report is printed is determined by the scheduling value specified in the printer device file QPQUPR FIL. The scheduling value is specified on the SCHEDULE parameter of, for example, the CRTPRTF (Create Printer File) command.

**N = No**

The output for your report is not to be spooled; it is sent directly to the printer to be printed as each output record becomes available.



**Form type:** You probably do not need to specify this value to print your query. If you leave this prompt blank, the value specified in the printer device file (named QPQUPRFIL) used by Query determines which forms are to be used to print the report. If you want to print your report on a particular type of form, type the name of the form or type the special value \*STD.

- If you type the name of a form, it must be a form name that has been defined on the system. After the query runs and the output is ready to be printed, a message appears on the system console telling the operator to change the forms in the associated printer to the forms type that you specified by name.
- If you type \*STD, the system assumes that the standard forms are already in the printer, and no message is sent to the system operator.

**Copies:** Type a number from 1 through 255 to indicate the number of copies of the report that you want printed. If you leave this prompt blank, the value specified in the printer device file (named QPQUPRFIL) used by Query determines the number of copies to be printed.

**Hold:** Type a Y or N to indicate whether your report is to be printed now, or is to be held and printed at a later time. The value in this prompt, however, is ignored if the value specified or assumed in the *Spool the output* prompt is N. If you leave this prompt blank, the value specified in the printer device file used by this printer determines whether the report is to be held or not.

If you specified that the output for your query is to be spooled when your query is run, your report is created as a spooled printer file and sent to an output queue. You can specify either that the spooled file be printed as soon as it can be scheduled, or that it be *held* on the output queue until it is released for printing at a later time.

**Y = Yes**

The output for your report is to be held as a spooled printer file on an output queue. The report is not printed until the spooled file is released for printing at a later time.

**N = No**

The output for your report is not held; it is printed as soon as it can be scheduled.

## Defining the Printout Cover Page

The Specify Cover Page display is another print definition display used to continue defining the print characteristics of your query report. On this display, you can specify whether you want a cover page to be printed for your report, and you can specify as many as four lines of text to be printed on the cover page.

Specify Cover Page

Type choices, press Enter.

Print cover page . . . Y                      Y=Yes, N=No

Cover page title

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

F3=Exit  
F13=Layout
F5=Report  
F18=Files
F12=Previous

**Print cover page:** Type a Y or N to indicate whether a cover page is to be printed at the beginning of your report.

**Y = Yes**

A cover page is to be printed. It will contain any text that you specify on the *Cover page title* prompt, the date and time of printing, and information about your query (its name, its library name, the files selected, and text describing the query, if any).

**N = No**

No cover page is to be printed for your report. If you specify text on the *Cover page title* prompt, it is saved for future use.

**Cover page title:** Type the title, or title text, to be printed on your report as a cover page. You can type as many as four full lines of text using all characters (including uppercase and lowercase letters) that can be printed by the printer that you specified on the Define Printer Output display.

If you press F5 (Report) or F13 (Layout) to *display* the report or its layout, this title is *not* shown.

## Defining the Page Headings and Footings

The Specify Page Headings and Footings display is the last print definition display used to define the print characteristics of your query report. On this display, you can specify whether you want page headings and footings to be printed on all the pages of your report (except the cover page). You can also specify whether you want to print the standard version of page heading information used by Query, print only your own headings, or print both types. The standard page heading is used only on heading line 1 of each page; it contains the system date and time, the current page number, and any text that you specify here for the first heading line.

If you specify your own heading text or footing text, you can use three special codes in either one (or in both) that cause the system date, the system time, and the current report page number to be printed exactly where you want them in your text. These codes are provided so you can use them instead of the standard headings and format them however you wish.

- &date** The system date, printed in the system's standard date format.
- &time** The system time, printed in the system's standard time format.
- &page** The current page number of the report, printed without a caption (you can specify your own). Leading zeros are replaced with blanks, and values of 1 through 9999 are printed (with no thousands separators). However, because the page field is only four positions, the leading zeros *are* shown for all pages after 9999 (to indicate that there is an unprinted 1 in front of the four printed digits; page 10,000 shows as 0000, page 10,001 shows as 0001, and so on).

These codes can be used anywhere you want in the heading and footing text, and they can be used more than once.

Specify Page Headings and Footings

Type choices, press Enter.  
(Use &date, &time, and &page in text, or choose standard page headings.)

Print standard  
page headings . . . Y Y=Yes, N=No

Page heading

---

---

---

Page footing

---

F3=Exit F5=Report F12=Previous  
F13=Layout F18=Files

**Print standard page headings:** Type a Y or N to indicate whether the system's standard headings are to be printed on each page of your report (except for the cover page). You *must* specify an N if you do not want to print the standard headings; your use of the special date, time, and page codes does not control the printing of the standard information.

When the standard heading is used, it automatically formats and shows:

- On the top left, the current system date and time (of printing)
- On the top right, the page caption and page number (of the current page)

If you type a Y for this prompt and also specify your own heading text, Query prints the standard information in the same locations on the first line and includes as much of your first line of heading text as it can. Your text is centered between the standard information and is truncated on the right end if it cannot all be used. Your other two heading lines, if any, are also centered and printed below the first line.

Note that your other two heading lines are centered on lines 2 and 3, and not with respect to your heading text on line 1. The longest line of lines 2 and 3 is centered on its own line, then the shorter line starts at the same position as the longest line does. Any text that cannot fit on either line is truncated.

**Y = Yes**

The standard heading information is to be printed on each page. Your heading text, if any, is also printed.

**N = No**

The standard heading information is not to be printed. Only your heading text, if any, is printed. If you do not specify any heading text in the *Page heading* prompt, no page heading information is printed.

**Page heading:** Type the text, if any, for the heading that you want printed at the top of all the pages of your report, except for the cover page. You can type as many as three full lines of text using all characters (including uppercase and lowercase letters) that can be printed by the printer that you specified on the Define Printer Output display. You can also use the special codes &date, &time, and &page wherever you want in your heading text.

If you press F5 (Report) or F13 (Layout) to *display* the report or its layout, this page heading is *not* shown.

**Page footing:** Type the text, if any, for the footing that you want printed at the bottom of all the pages of your report, except for the cover page. You can type one full line of text using all characters (including uppercase and lowercase letters) that can be printed by the printer that you specified on the Define Printer Output display. You can also use the special codes &date, &time, and &page wherever you want in your footing text.

If you press F5 (Report) or F13 (Layout) to *display* your report or its layout, this page footing is *not* shown.

## Selecting Output to a Data Base File

The Define Data Base File Output display is used to specify which data base file is to be used to store your query output. This display is shown because you specified option 3 (Data base file) on the Select Output Type and Output Form display. On this display, you specify the name of the file and file member, and you indicate whether the query output is to create a new file or member, be added to an existing member, or replace an existing file or member.

The output to be stored can be the records selected by your query (if the detailed form of output was specified), or the output can be the summary information produced from report breaks and summary function values defined in your query. You can also specify whether your query definition is to be printed when your query output is stored.

For data base file output, the following report characteristics (although they may be defined in this query definition) are ignored: column spacing, cover page, and page headings and footings. And if the detailed form of output was selected, any column headings or changed field lengths (both specified on the Specify Report Column Formatting display) or any report breaks or summary values that may be defined are also ignored. If you later change the output type or the output form on the Select Output Type and Output Form display, these defined characteristics can be used as specified.

The data from your query is saved in your data base file in the order that the fields are specified in your query. If you requested detailed output, but did not select fields for your query, all fields for selected records are placed in your data base file, followed by any defined result fields.

Define Data Base File Output

Type choices, press Enter.  
(The printed definition shows the output file record layout.)

File . . . . .	QQUERYOUT	Name, F4 for list
Library . . . . .	QGPL	Name, F4 for list
Member . . . . .	*FILE	Name, *FIRST, *FILE, F4 for list

Data in file . . . . . 1

1=New file, 2=Replace file  
3=New member, 4=Replace member  
5=Add to member

For choice 1=New file:

Authority . . . . .	*CHANGE	*CHANGE, *ALL, *EXCLUDE, *USE, authorization list name
---------------------	---------	---

Text about  
the file . . . . .

---

Print definition . . . N Y=Yes, N=No

F3=Exit	F4=List	F5=Report	F12=Previous
F13=Layout	F18=Files		

The following considerations apply when you define your query to put its output in a data base file:

- Unless you use lists to select them, the file and library names that you specify on this display are not checked at this time for their existence or for your authority to use them. These items are checked when the query is run; the file is also checked to ensure that it is a data base file.
- You cannot specify the name of a file on this display that your query uses to get the data.
- If summary only output is being used and an overflow error occurs in a numeric field, 9s are put in the field instead of the data. If the field contains floating-point data, then 0's are used instead. The overflow indicator will have an asterisk (\*) in it when data has been overflowed for any of the fields.

### Using an Output Data Base File

**File:** To specify the data base file that is to store your query output, you can type a file name, use the name already shown, or press F4 to see a list of existing file names. If you intend to use an *existing* file, you can select the one you want from the displayed list. If you intend to create a *new* file, the file name you specify should not exist in the library that you want the new file stored in.

Do one of the following:

- Type the name of the data base file that is to contain the output of your query. If you specify \*LIBL in the *Library* prompt, and an existing file is to be used, the first file with that name found in the library list is used; if a new file is to be created, it is created and stored in the first library in the library list.
- Leave the file name that is shown. However, if the name is QQUERYOUT, you might want to change it; QQUERYOUT is a file that others can use and, therefore, they might use it and replace your data or you might replace theirs.
- With the cursor in the *File* prompt, press F4 (List) to see, on the Select File display, a list of all the files that you have the authority to use in the specified library or library list.

If you intend to use an *existing* file, you can select the one you want from the list.

If you want to create a *new* file:

- You should verify that the name you want to use is *not* in the list. (Note, however, that you see only the files for which you have the authority to use, and that even though a file by that name may not exist now, it could be created before the time you actually run this query. At that time, if a file by that name exists in the library you specified, you get an error message and you will have to change this query definition or replace the existing file.)
- The file name must begin with an alphabetic character (A through Z, \$, #, or @), and it can be followed by no more than nine alphanumeric characters (A through Z, 0 through 9, \$, #, @, ., or \_); for example, NAMEADDR or INVEN\_12.

Because most system-supplied objects on the AS/400 system begin with Q, your file names should not start with a Q. Also, if you have systems in countries that use different languages, you might not want to use \$, #, or @ because they might not be translatable characters.

**Library:** Shows the name of the library that contains or will contain the data base file to be used. The initial library value shown in this prompt is: the value last used on this display, the name of your current library (if specified), or QGPL if you have never used this display and you do not have a current library.

If you want to use a different library than the one shown, you can type a different library name or press F4 to see a list of library names. Do one of the following:

- Type the name of the library that contains or will contain the file for the query output.
- If you type a generic library name (in the form of ABC\*) or a special library name (\*LIBL, \*USRLIBL, \*ALL, or \*ALLUSR), and then press F4 with the cursor in this prompt, the specified list of library names is shown on the Select Library display. When you select the library you want from the list and press Enter, you return to this display with the selected name filled in.

**Member:** Type the name of the member in the specified data base file that you want your output to be placed in. You can also specify \*FILE (the default), \*FIRST or \*LAST; if one of these is used, the value is changed to the actual member name when your query is run.

Or, with the cursor located in this prompt, you can press F4 to list the members in the file, and select one from the list; however, if you are creating a *new* member, you should use a name not shown in the list. If you are creating or replacing a file, and you specify \*FILE, \*FIRST, or \*LAST in this prompt, a member is created with the same name as the file.

If you are creating a new file and specify \*FIRST as the member name, the member added to the new file has the same name as the file.

**Data in file:** Type the number of one of the following options to tell Query (at the time it is running your query) how to use the file and member you specified in the *File* and *Member* prompts:

#### **1 = New file**

Creates a new file with the name specified in the *File* prompt and a member with the name indicated in the *Member* prompt. While running the query, if Query finds a file by that name in the library specified in the *Library* prompt, a message is displayed. You can either type a C (cancel) to cancel running the query or type a G (go) to continue running and to specify that the file is to be replaced by the data from your query.

#### **2 = Replace file**

Replaces the existing file named in the *File* prompt with the data from your query. The file definition and all the members of the file are deleted, and your data is put into a new member that is named with the name specified in the *Member* prompt.

#### **3 = New member**

Creates a new member with the name specified in the *Member* prompt. While running the query, if Query finds a member by that name in the file specified in the *File* prompt, a message is displayed. You can either type a C (cancel) to cancel running the query or type a G (go) to continue running and to specify that the member is to be replaced by the data from your query.

#### **4 = Replace member**

Replaces the existing member named in the *Member* prompt with the data from your query. All the data in that member is deleted, and your data is added. If a member by that name did not exist, the member is created and the data is put in it.

#### **5 = Add to member**

Adds the data from your query at the end of the data in the existing member named in the *Member* prompt. If a member by that name did not exist, the member is created and the data is put in it.

When your query data is put into a file that already exists, the format of the query data must match the format definition of the existing data base file.

For any of the options that replace data in existing files or members, the following also controls whether you can replace that data. The data cannot be replaced in a file or member if:

- Other files depend on the definition of this file. For example, you cannot replace the data in a physical data base file on which other logical data base files are based. You can use the DSPDBR (Display Data Base Relations) command to see the relationships of a file to other files.
- You do not have the needed authority for the file to be replaced.
- The format definition of the file does not match the format of your query data. The file must be a physical file that has only one format definition.
- The output file or member names are the same as any of the selected files or members used in your query.

**Authority:** Type the value for the kind of object authority that you want to give to other users for your data base file. (This authority value is used *only* if your query is defined to *create* a new file.) The values that you can specify are:

#### **\*CHANGE**

**Change authority** allows other users to perform all operations on the object except those limited to the owner or controlled by object existence authority and object management authority. A user can change or use the file in any way

except to: replace or add new members, delete the file, or transfer it to a new owner.

**\*ALL**

**All authority** allows other users to perform all operations on the object except those limited to the owner or controlled by authorization list management rights. A user can do anything with the file (including deleting it), except for transferring it to a new owner.

**\*EXCLUDE**

**Exclude authority** prevents other users from doing anything with the file. Unless given specific types of authority, no user except its owner can use the file.

**\*USE**

**Use authority** allows other users to read records in the file.

**authorization list name**

If you specify the name of an authorization list, its authority is used to control the ability that users have to use the file. For more information, see the *Security Concepts and Planning* manual.

The following table shows, for each predefined type of authority, what can be done with the file.

Type of Authority	Create New File	Replace the File	Add New Member	Add to Member	Replace Member
*ALL	Yes	Yes	Yes	Yes	Yes
*CHANGE	Yes	No	No	Yes	No
*USE	Yes	No	No	No	No
*EXCLUDE	Yes	No	No	No	No

**Text about the file:** If your query creates a new data base file in which to store the query output or replaces an existing file (option 1 or 2 of the *Data in file* prompt), you can type a comment (text) of up to 50 characters in this prompt to describe that file. The comment reminds you what the file is for when it is displayed later in a list of files. The comment is displayed, for example, on the Select File display whenever the *Text* column is shown.

**Print definition:** Type a Y or N to indicate whether you want a copy of your query definition to be printed whenever the query output is stored in the data base file. N (No) is the default.

**Y = Yes**

A copy of your query definition (and the output data base file definition) is to be printed whenever the query output is stored in the file.

**N = No**

A copy of the query definition is *not* to be printed when the query is run.

## Summary-Only Output to a Data Base File

The data sent to a data base file, when summary-only output is selected, is one of the following (assuming no summaries have been suppressed):

- If no summary functions or report breaks have been selected, the output is a single record containing a count of the records selected by your query.
- If summary functions but no report breaks have been selected, the output is a single record containing summary function values.



- If report breaks but no summary functions have been selected, the output is a record containing report break values for each report break.
- If both summary functions and report breaks have been selected, the output is a record containing report break values and summary function values for every report break and for the final totals.

For a better understanding of summary-only output to a data base file, compare the summary data base file output with a printed report from the same query. The data produced is the same but the layout of the data is different. If you print the query definition for a query with output sent to a data base file, the record format layout is included.

The information in each summary-only record that is output to a data base file has the following format:

- The first position of each record contains a break level number.
- The second position of each record contains an overflow indicator.
- The third position of each record begins the actual data.

The break level is a number from 0 through 6, which identifies the different report break levels output to a record. A 0 identifies a final total (summary) record. The numbers 1 through 6 identify a report break and correspond to the level number associated with the report break.

The overflow indicator indicates when data has overflowed in 1 or more fields in this record. The indicator position is blank if overflow has not occurred. An asterisk (\*) appears if any total, average, or count field overflows, or if a numeric field is truncated. The field that has overflowed is filled with 9s.

The output data is grouped together by field with the report break values followed by any summary function values for the field. The data for break fields, with priority lower than the current break level, is always blank. Summary data is output in the following order: total, average, minimum, maximum, and count. If a field is totaled, Query adds three digits to the field length to hold the total (up to a maximum of 31 digits). If a field is counted, the output field is 7 characters long. Packed and binary data is converted to zoned decimal format when saved in a disk file.

As an example, assume you have an input file containing personnel information about all state employees. You set up a query that requests total salary, average salary, and the number of employees in each county and city. The query sorts on two fields: CITY within COUNTY. Report breaks are defined for these fields and the Salary field for each county is totaled, averaged, and counted.

If you ran this query and selected summary-only output, the following seven records would be sent to a data base file:

2	Los Angeles	Arcadia	00007000000	03500000	0000002
2	Los Angeles	Glendale	00009000000	04500000	0000002
1	Los Angeles	.....	00016000000	04000000	0000004
2	Orange	Costa Mesa	00006000000	03000000	0000002
2	Orange	Irvine	00008000000	04000000	0000002
1	Orange	.....	00014000000	03500000	0000004
0	.....	.....	00030000000	03750000	0000008

Break level ID (1)		Total salary (11.2)	
Overflow indicator (1)			Average salary (8.2)
County (10)	City (10)		Count (7.0)

The number in parentheses, behind the explanation of the field, is the output field length and number of decimal positions. A null value is shown as a string of periods. Note that the overflow indicator column is blank, indicating all of the numeric data fits. The report breaks for CITY (break level 2) have break values for both COUNTY and CITY. The report breaks for COUNTY (break level 1) have break values for COUNTY only. The last record (break level 0) contains the final totals of the summary functions and has no break values. The blanks shown between the fields are for example purposes only; the actual data base file output has no blanks between fields.

In the above example, the query had both summary functions and report breaks specified. If this query had neither summary functions or report breaks specified, the output would be a single record (break level 0) containing a count of the records selected by the query. For example:

```
0      0000008
```

If this query had summary functions but no report breaks specified, the output would be a single record (break level 0) containing summary function values for the records selected by the query. For example:

```
0      00030000000  03750000  0000008
```

If this query had report breaks but no summary functions specified, the output would be a record for each report break specified. In the first example above, this would be the first six records without their summary functions. For example:

```
2      Los Angeles  Arcadia
2      Los Angeles  Glendale
1      Los Angeles  .....
2      Orange      Costa Mesa
2      Orange      Irvine
1      Orange      .....
```

You can use a file containing the query data the way you do any other file on your system. Therefore, you can select this file on the Specify File Selections display for another query which might possibly increase the speed at which your new query runs because the file may now:

- Contain fewer records and data fields
- Be already sorted the way you want
- Not need to be shared with other users

## Chapter 14. Specifying Processing Options

This chapter describes how you specify processing options for numeric fields when you run a query. The processing options you can specify are:

- Whether the results of numeric field calculations or field length changes done for your query are to be rounded or dropped off (truncated)
- Whether errors and bad data found in numeric fields are to be ignored

### Purpose of Processing Options

The processing options available on the Specify Processing Options display help you control the precision and accuracy of your query output. Sometimes you might require that your query output be pinpoint precise, such as if you were calculating the interest charged to a customer for credit. Sometimes you may not care if your results are quite so precise, such as if your query calculates the approximate percentage of customers who purchased more than \$10,000 worth of your company's products last year.

Specify Processing Options

Type choices, press Enter.

Use rounding . . . . .	Y	Y=Yes, N=No
Ignore numeric field errors . . . . .	Y	Y=Yes, N=No

F3=Exit  
F13=Layout

F5=Report  
F18=Files

F12=Previous

### Rounding Numeric Field Values

You can control whether the result of numeric field calculations or field length changes should be rounded or truncated when your query is run. By typing a Y in the *Rounding* prompt on the Specify Processing Options display, all of your numeric field calculation results will be rounded (if necessary) when your query is run. By typing an N in the prompt, all of your numeric field calculation results will be truncated (if necessary) when your query is run.

**Note:** If your query was created on a AS/400 system, a Y is shown as the default. If Query determines that your query was originally created on a System/36, an N

is shown as the default so that the query can be processed the same as it was on System/36.

Whether you choose to have numeric field calculations rounded depends on how precise you require your results to be. Initially, you need to determine how rounding or truncation will affect your results. If your query uses several multiplication or division operations, the result of a numeric field calculation may differ significantly whether your results are rounded or truncated. This is because rounding or truncation could occur more than once for the field as the calculations are performed. For example, multiplying a customer's balance due times an interest rate may yield a result with more decimal positions than you need or are allowed to have. If necessary, the result is rounded or truncated thus introducing a *small* error in the result. Suppose that this result is then added to similar calculations for other customers. Then all of the *small* errors begin to add up to a *larger* error. This error may or may not be significant, but it will probably be different depending on whether you have selected rounding or truncation.

Rounding and truncation are not done just on result fields, they are also done on the average and total summary functions on the Select Report Summary Functions display and when overriding the numeric field length on the Specify Report Column Formatting display (such as changing from five decimal positions to three decimal positions).

---

## Ignoring Numeric Field Errors

By typing a Y or an N after the *Ignore numeric field errors* prompt, you can indicate whether you want Query to ignore any errors it finds in numeric fields when your query is being run. For example, an A (hex C1) in a zoned numeric field is an error. If you have chosen that errors in numeric fields be ignored, the A will be changed to a 1 (hex F1). If you have chosen that errors in numeric fields *not* be ignored, either an error message is displayed or the field value is shown in the output as plus signs (++++). The error you get depends on how the field is used.

**Note:** If your query was created on a AS/400 system, a Y is shown as the default. If Query determines that your query was originally created on a System/36, a Y is shown as the default so that the query can be processed the same as it was on System/36.

# Chapter 15. Exiting and Running a Query

This chapter describes how to exit query definition and the five ways you can run your query.

## Ending Query Definition

When you have finished creating a query and have pressed F3 (Exit) on one of the definition displays, one of two displays is shown. If you did not enter Query from Office or DisplayWrite 4, the Exit This Query display is shown.

Exit This Query

Type choices, press Enter.

Save definition . . . Y

Y=Yes, N=No

Run this query . . . . Y

Y=Yes, N=No

For a saved definition:

Query . . . . .

Library . . . . . QGPL

Name

Name, F4 for list

Text about

the query . . . . .

Authority . . . . . \*CHANGE

\*CHANGE, \*ALL, \*EXCLUDE, \*USE,  
authorization list name

F4=List

F5=Report

F13=Layout

F14=Go to Define the Query

If you entered Query from Office or DisplayWrite 4, and you have been creating or changing a query, the Exit Data/Text Merge display is shown.

Exit Data/Text Merge

Type choices, press Enter.

Save definition . . . .	Y	Y=Yes, N=No
Merge option . . . . .	1	1=Work with a different query 6=Direct merge of data 7=Column list data instructions 8=Multicopy data instructions

For a saved definition:

Query . . . . .		Name
Library . . . . .	QGPL	Name, F4 for list

Text about the query . . . . .

Authority . . . . .	*CHANGE	*CHANGE, *ALL, *EXCLUDE, *USE authorization list name
---------------------	---------	--

F4=List  
F14=Go to Define the Query

F5=Report

F13=Layout

**Note:** Option 7 (Column list data instructions) and option 8 (Multicopy data instructions) are not shown if you came from DisplayWrite 4.

You can save a newly created query or changes to a previously saved query from either of these displays.

## Saving a Definition

When you save your query definition, all the values that you defined are saved with it. It is saved in the library that you specify, and it is saved as a query definition object whose type is \*QRYDFN. If this is a new object, you are its owner, and you can specify which other users can use your query and in what way. Like other objects, you can display information about it using the DSDOBJD (Display Object Description) command.

## Storing the Definition

Query has already supplied a Y for the *Save definition* prompt on the Exit This Query and Exit Data/Text Merge displays—most of the time you will want to save a newly created query or changes to a previously saved query. You do not have to save a query; however, if you do not save it, you will lose your new query definition or changes if you choose to run the query now.

In order to save a newly created query, you need to type a query name (*Query* prompt) and library name (*Library* prompt) if you did not already do this on the Work with Queries display. To display a list of libraries, position the cursor on the *Library* prompt and press F4.

You do not need to supply a query name or library if you are saving changes to a previously saved query; these names should already be filled in on the display. If you change either the query name or the library, you create a new query with that name and library, and the original query remains unchanged.

## Describing the Definition

You can also type some descriptive text about the query. The text reminds you what the query is for when it is displayed in a list of queries or printed on the cover page of a report. The text is displayed, for example, on the Work with Queries display whenever the *Text* column is shown.

## Giving Authority to Others for Your Query

You can specify the type of authority that you want to give to other users for this query definition object. What you specify on the Exit This Query display or Exit Data/Text Merge display determines how other users can use the query. If you do not specify any authority on the Exit This Query display or the Exit Data/Text Merge display, other users will have \*CHANGE access to your query definition.

The values that you can specify are:

### \*CHANGE

**Change authority** allows other users to perform all operations on the object except those limited to the owner or controlled by object existence authority and object management authority. A user can change or use the query definition in any way, except that it cannot be copied, deleted, or transferred to a new owner.

### \*ALL

**All authority** allows other users to perform all operations on the object except those limited to the owner or controlled by authorization list management rights. A user can do anything with the query (including deleting it), except for transferring it to a new owner or changing the type of authority.

### \*EXCLUDE

**Exclude authority** prevents other users from doing anything with the query definition. Unless given specific types of authority, no user except its owner can use the query definition.

### \*USE

**Use authority** allows other users to run the query or to display or print the query definition. A user cannot copy the query definition nor save the definition with changes made to it.

### authorization list name

If you specify the name of an authorization list, its authority is used to control the ability that users have to use the query. For more information, see the *Security Concepts and Planning* manual.

The following table shows, for each predefined type of authority, what can be done with the query.

Type of Authority	Change Query	Copy Query	Delete Query	Display Query	Print Query Definition	Run Query	Change Authority
*ALL	Yes	Yes	Yes	Yes	Yes	Yes	No
*CHANGE	Yes	No	No	Yes	Yes	Yes	No
*USE	No	No	No	Yes	Yes	Yes	No
*EXCLUDE	No	No	No	No	No	No	No

## Data or Text Merge Query Considerations

If you do not save a query intended for merging data or text into a Office or DisplayWrite 4 document, you will lose your new query definition or changes if you specify 6 for the *Merge option* prompt on the Exit Text/Data Merge display, and you cannot specify 7 or 8 in the *Merge option* prompt to pass back data field instructions.

---

## Running a Query

Running a query consists of telling Query to use the query definition to acquire the data you want from selected files, to organize the data into a report format, and then to either display the report, print it, or store it in a data base file.

To run a query, you can:

- Press F5 while creating, displaying, or changing your query. This runs the query and displays the report.
- Choose option 2 (Run an existing query) on the Query menu.
- Type a Y in the *Run this query* prompt on the Exit This Query display.
- Choose option 9 (Run) on the Work with Queries display.
- Use the RUNQRY command.

## Specifying Merge Option for Data or Text Merge Queries

If you entered Query from Office or DisplayWrite 4, you cannot run a query from the Work with Queries display or the Exit Data/Text Merge display. (You can use F5 (Report) if no dependent values are used in record selection tests for a query.) You can, however, supply an option for the *Merge option* prompt on the Exit Data/Text Merge display. The *Merge option* specifies how you want to merge the query data with your Office or DisplayWrite 4 text document.

**Note:** If you have chosen not to save your query, you *cannot* specify 7 or 8 in the *Merge option* prompt to pass back data field instructions.

Type the number of the option that you want Query to process when you exit this query definition. If you do not want to merge any data at this time, specify option 1. This returns you to the Work with Queries display so you can either work with a different query to be used with your document or exit Query. Option 6 runs the query, creates a query report, and returns the report to you in Office or DisplayWrite 4. Then you can copy the report into the document you are working on. Options 7 and 8 create data field instructions for the merge and return the instructions to Office. Then you can copy the instructions into the document you are working on.

Merging query data with an Office document is explained in the Office online information and in the manual *Word Processing User's Guide*. Merging query data with a DisplayWrite 4 document is explained in the DisplayWrite 4 help facility.



## Using Function Key F5

If dependent values are *not* used in record selection tests, you can run a query at any time by pressing F5 while you are creating, changing, or displaying it. Your query will run immediately; the report is displayed, and you can see what the report looks like and how any changes that you make affect it.

## From the Query Menu

You can run an existing query by selecting option 2 (Run an existing query) on the Query menu. This causes the RUNQRY (Run Query) command help display to appear. For more information on using the RUNQRY command, see the *CL Reference* manual and “Using the RUNQRY Command” on page 15-7.

## From the Exit This Query Display

When you finish creating or changing a query, the Exit This Query display is shown.

Exit This Query

Type choices, press Enter.

Save definition . . .	Y	Y=Yes, N=No
Run this query . . . .	Y	Y=Yes, N=No

For a saved definition:

Query . . . . .	_____	Name
Library . . . . .	QGPL	Name, F4 for list

Text about  
the query . . . . . \_\_\_\_\_

Authority . . . . .	*CHANGE	*CHANGE, *ALL, *EXCLUDE, *USE authorization list name
---------------------	---------	--

F4=List  
F14=Define the query

F5=Report

F13=Layout

Query assumes that you want to both save and run your query, so it usually supplies a Y in response to the *Save definition* and *Run this query* prompts. However, Query supplies an N for the *Run this query* prompt in either of the following situations:

- Your query has an error.
- Your query has dependent values in record selection tests. This query can be used only when you are merging data into text using Office. See the Office online information for more information about merging data into text.

You can run a query and get the report without saving the definition of the query. However:

- If you are creating a query and choose not to save it, it will run only once and then be lost. To save your query, you need to supply values for the *Library* and *Query* prompts. The query name must be a unique query name in that library. If not, Query will issue a message asking if you want to replace the existing query or not.
- If you are changing a query and choose not to save it, it is kept without the changes, and the newly changed or newly entered values are used only if you run

the query now. That is, if you changed an existing definition, the report shows the results of the changes only one time; if the report is run again, the results are based on the original definition.

To save a newly changed query, you do not need to supply a library name and query name; if you do, the original query remains unchanged, and a new query is created with the changes you made. Type the name of the library in which the query is to be saved. Only an actual library name or \*CURLIB can be specified for the *Library* prompt. However, if you want to first see a list of libraries from which you can select one, do the following: move the cursor to this prompt, type a special library name (such as \*LIBL) or a generic library name (in the form of ABC\*), and press F4.

If you do not save the query now and later you want to run it again, you will have to redefine it first.

If you choose to run the query now, press the Enter key. Query shows the report on your display, prints the report on a printer, or places the data from the query in a data base file. For more information on selecting an output device, see Chapter 13, "Selecting Output Type and Output Form."

Because you can create a query for a file that does not contain any data, you can also run a query that uses an empty file. However, no data shows in the report or is placed in a data base file. Instead of running a query that uses an empty data file, you could press F13 on the Exit This Query display, and your report layout will be displayed.

## From the Work with Queries Display

From the Work with Queries display, you can only run a query that has been previously saved. The query runs exactly as it was defined. If you want to change anything about the output device, you must first change the query and then run it.

**Note:** If you came to this display while using Office or DisplayWrite 4, you cannot use the print definition and run options.

To run a query from the Work with Queries display:

1. Select option 9 (Run).
2. Type the name of the query. If you do not know the name of the query, "Selecting a Query Name from a List" on page 2-10 tells you how to see a list of query names.
3. Type the name of the library in which the query is stored. Query assumes it is stored in the library for your last Query work session or in your current library. If you do not have a current library, Query assumes it is stored in QGPL. You can change the assumed library name to that of a different library. If you do not know the name of the library, "Selecting a Library" on page 2-12 tells you how to display a list of library names.
4. Press the Enter key.

Work with Queries

Type choices, press Enter.

Option . . . . .	1=Create 2=Change 3=Copy 4=Delete
	5=Display 6=Print definition
	9=Run
Query . . . . .	Name, F4 for list
Library . . . . . QGPL	Name, *LIBL, F4 for list

F3=Exit
F4=List
F5=Refresh
F12=Previous

Query displays a report, prints a report, or puts the data into a data base file, depending on what is specified on the Select Output Type and Output Form display. For more information on selecting an output device, see Chapter 13, “Selecting Output Type and Output Form.”

Query uses current data each time a query is run. For example, if a customer’s address changes in the file, the new address appears in the data produced when the query is run. However, if definition of data has changed since the query was created or last changed, the report created by the query may not show these changes. For example, assume you want to run a query that does not have column headings specified. The query then uses column headings defined by IDDU. If the IDDU column headings have been changed since the query was created or last changed, the query may not use the new headings.

When you change a query, Query updates the query with the current IDDU definitions. If you save the query, any IDDU changes are saved with it. Therefore, you can make sure you have the current definitions when you want to run the query from the Work with Queries display by selecting option 2 (Change) instead of option 9 (Run). You can then save the query without actually making any changes by doing the following:

- Press F3 on the Define the Query display.
- Choose to save the definition *and* run the query on the Exit This Query display.

IDDU definitions are explained in the IDDU online information.

## Using the RUNQRY Command

If a query does not contain dependent values or was not stored with errors, you can use the RUNQRY command to run the query. The output can either be displayed, printed, or stored in another data base file.

The RUNQRY command can be used three different ways: to run an existing query (one that has already been created), to run an existing query with some of its definition values changed by values you specify on this command, or to run a default

query based only on the parameter values specified on this command. (You supply parameters values to give Query information it needs, such as the query name, the library in which the query is stored, where to send the output, and so on.)

For detailed information on the RUNQRY command, its parameters, how to use it, and some examples, see the *CL Reference* manual.

Following are some suggestions for using the RUNQRY command:

- If you want to use an existing query without changing the file or files to query, specify only a query and library name (without an input file name). This will run the query exactly as it was defined.
- If you want to run a default query on a file, specify only an input file name. This will produce a report showing the information contained in the first 500 fields of each record.
- If you want to run a changed version of an existing query, specify a query name and the appropriate parameters to change the definition to what you want. The parameter values you specify on this command override the corresponding values in the existing query definition, but only when the command is processing (that is, the changes are not permanently made to the query definition).
- If you specify both a query name and an input file name, the files specified by the input file name parameter override the file name(s) specified in the query definition. Therefore, if multiple files (and members) are defined in the query definition and you want to change one or two of them, you must specify \*SAME for the file selections that do not change and specify the values for the ones you want to override.



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## Chapter 16. Working with Query Definitions

This chapter describes the ways you can work with your query once it has been created and saved in a library. In addition to running your query:

- You can modify the results of your query output by making changes to your query definition.
- You can copy your query definition to another library so that other users can have their own copy to work with.
- You can delete one or more of your query definitions that are no longer needed.
- You can rename your query by using a new name when you copy it to the same library or to a different library. Then you can delete the old query.
- You can display the definition of your query without being able to make any changes to it.
- You can print your query definition if you want a printed copy for documentation purposes.


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### Changing a Query Definition



You can change a previously saved query by using option 2 (Change) on the Work with Queries display. You can supply a query and library name on the display, or you can select a query from a list. (For more information about using lists, see “Using Lists” on page 2-4.)

Changing a query is almost the same process as creating a query. You choose the definition steps on the Define the Query display for which you want to change query definition values. When the definition step displays appear, the prompts are already filled in. To change the query, all you need to do is change or delete the values in the prompts.



When you have finished changing a query, you can run it, save it, run it and save it, and so on.

### Starting Changes by Copying a Query Definition

You may find it helpful to use option 3 (Copy) on the Work with Queries display before you change a query. If you copy the query you want to change, the original is not affected by the changes you make. Then, should you decide that you would rather have your query as it was originally defined, you do not have to change everything back. You can delete the changed query (as explained later in this chapter) and keep the original.

If, however, after running and testing the changed query, you decide you want to keep the changes, you can delete the unchanged original query.

## Changes You Can Make

In general, you can make two kinds of changes to a query. You can change:

- What data is reported by changing the record and or field selection
- The characteristics of the report (or output) by changing the formatting, the summarizing, or the report breaks

Each type of change may require that you select several definition steps on the Define the Query display by typing a 1 in the *Opt* column next to the definition steps you want to change.

Define the Query

Query . . . . . : QRY1

Option . . . . . : Change

Library . . . . . : QGPL

Type options, press Enter. Press F21 to select all.  
1=Select ('>' identifies previously defined options.)

Opt	Query Definition Option
>	Specify file selections
-	Define result fields
-	>Select and sequence fields
-	Select records
-	Select sort fields
-	Select collating sequence
-	>Specify report column formatting
-	Select report summary functions
-	Define report breaks
-	Select output type and output form
-	Specify processing options

F3=Exit	F5=Report	F12=Previous
F13=Layout	F18=Files	F21=Select all

The options currently defined for your query are shown with a “>” to the left of the option. You can change these and define additional options. You can choose as many options as you want from this display. Each of these options and their associated displays are described in previous chapters.

Each option has its own corresponding display(s), on which you can make specific changes. The displays for the options you select are shown to you in the order they appear on the Define the Query display.

If you decide you do not want an option that has already been defined, do the following:

1. Select that option on the Define the Query display.
2. Blank out any prompts that are completed for that option display.

If you decide not to change anything on an option display once you see it, just press the Enter key without changing anything and continue. If you have changed the display and decide you would rather have it the way it was, press F12. F12 does two things:

- Ignores any changes you made to the display (for list displays, this includes changes made on any “page” of the list) except:
  - If you used F24 on the Select Collating Sequence display or the Define Collating Sequence display
  - If you used F16 to remove some or all of your query-defined edit options

- If you made changes to the Define Printer Output display

Changes to previous displays, however, are kept.

- Returns you to the previous display.

For some definition step displays, F12 may discard more changes than those just typed on the display:

- All file selection work, including any join test changes
- All report column formatting, including edit override changes
- All report break work, including any changes in break formatting
- All record selection work, including that on the Specify Dependent Value Qualifiers displays

If you decide you do not want to keep the changes you have made on previous displays, press F3 to end the revision and type an N (No) for the *Save definition* prompt on the Exit This Query display.

When you are working at a display, you can press the Help key to see the help text that briefly describes how to specify the choices for that option. You can also press F5 or F13 to see how the changes affect the report the query produces.

When you finish making changes on all the displays you want to change, Query will return you to the Define the Query display, where the options now defined for your query are shown with a ">" to the left of the option. You can choose more options to make more changes, or you can press F3 to end the process of changing the query.

From the Exit This Query display, you can do either or both of the following:

- Save the query definition with the changes you have made.
- Run the query with the changes you have made.

Exit This Query

Type choices, press Enter.

Save definition . . . .	Y	Y=Yes, N=No
Run this query . . . .	Y	Y=Yes, N=No

For a saved definition:

Query . . . . .	_____	Name
Library . . . . .	_____	Name, F4 for list

Text about the query . . . .

Authority . . . . .	*CHANGE	*CHANGE, *ALL, *EXCLUDE, *USE authorization list name
---------------------	---------	--

F4=List                      F5=Report                      F13=Layout

F14=Define the query

You can change any combination of the *Query*, *Library*, and *Text about the query* prompts. If you save the query definition, these changes have the following effects:

Query Name and/or Library Name Changed	Query Name and Library Name Unchanged
Existing query name is not changed	Existing query is changed
New query created with new name and/or in different library	New query definition replaces existing definition
Text and authority applies to new query	Text and authority applies to new defi- nition of the query

If you are replacing a query, you cannot specify authorization list name authority; you must use one of the special names (\*CHANGE, \*ALL, \*EXCLUDE, or \*USE) or blanks (no change).

If you choose *not* to save the query definition, changes to the following prompts have the following effects:

Prompt Changed	Effect
Query name	None
Library name	None
Text about this query	Text prints on cover page when you run the query if printer is the selected output device
Authority	None

## Considerations for Changing Queries

Since making changes to your query requires that you choose the proper options on the Define the Query display, you should refer to the appropriate chapters for information and considerations on how to enter the definitions that you want.

## Changing Your Collating Sequence

Changing your collating sequence affects join and record selection tests involving character fields in different ways, depending on the test. EQ, NE, LIST, and LIKE tests compare character values for equality. These tests select the same records regardless of the collating sequence used.

LT, LE, GT, GE, and RANGE tests compare collating sequence values. Changing your collating sequence can change the records that these tests select. If your query calculates minimum and maximum summary values or if report breaks appear on your report, they may be affected also.

For example, using the EBCDIC collating sequence, the character 'E' has a higher sequence number than 'e'. In one record, field NAME1 has a value of 'LEE', and field NAME2 has a value of 'Lee'. The test NAME1 GT NAME2 selects this record because 'LEE' is greater than 'Lee'. (This record is also selected if you used the GE or NE tests. If you use the LT, LE, or EQ tests, the record is not selected.)



Now change the collating sequence to one in which 'e' and 'E' have the same sequence number. Using this collating sequence, tests GE, LE, and EQ select the record because 'LEE' and 'Lee' have the same collating sequence values. The tests GT, LT, and NE do not select the record.

Using the NE test, the record was selected with both collating sequences. Using the EQ test, the record was not selected with either collating sequence. EQ, NE, LIKE, and LIST compare character values, not collating sequence values. These tests select or ignore the same records no matter what collating sequence is used.

---

## Copying a Query Definition

There are many reasons for copying a query. Following are some of the most common:

- To copy a query from someone else's library into your library.
- To copy a query you keep in a test library for experimenting with different files, record formats, and query features. When you have a query you want to use, you can copy it into your library and keep the original in the test library for further experiments.
- To copy a query so that you can change it without changing the original.
- To rename a query or move a query to another library by copying the query to the other library and then deleting the query from the original library.

You can copy a previously saved query by using option 3 (Copy) on the Work with Queries display. You can type the name of the query (and its library) on the display, or you can, from a list of queries, type a 3 next to the query(s) that you want to copy. (For more information about using lists, see "Using Lists" on page 2-4.)

After you press the Enter key, the Copy Queries display appears. (The following display has some sample information typed in.)

Copy Queries

From library . . . . . : TESTLIB

Type choices, press Enter.

To library . . . . .

Name, F4 for list

Replace query . . . . . N

Y=Yes, N=No

To rename copied query, change To Query name.

From Query	To Query
ACCTREC FEB	
INVENT FEB	
MAILADDR	
PAYROLL FEB	

F3=Exit

F4=List

F5=Refresh

F12=Previous

F20=Cancel copy in error

To place the copy in a library other than the library that contains the original query, type a different library name in the *To library* prompt. If you do not know the name of the library that should receive the copy, you can use F4 to select a library from a list.

To place the copy in the same library as the original, do not type anything in the *To library* prompt.

Then select a choice in the *Replace query* prompt.

- Type a Y if you want the copy to replace a query that has the same name in the library.
- Leave the N in the prompt if you want to copy the query to the library only if no other query with the same name already exists in the library.

To rename the query(s), type the new name(s) in the *To Query* column. If you place the copy in the same library as the original query, you must type a new name for the copy. If you place the copy in a different library, you can rename it, or you can use the original query name.

When you are finished typing information on the Copy Queries display, press the Enter key. If Query finds no errors while copying the queries, all the queries are copied. If you did not select any other options from the Work with Queries display (such as change, delete, display, and so on), you return to the Work with Queries display. If you displayed a list of queries when you chose option 3 (Copy) from that display, the list is still displayed. This time, if you did not copy the queries to a different library, the names of both the original and copied queries are included in the list.

If Query finds an error while copying the queries, the list of queries being copied is shown and an error message appears at the bottom of the display. The query that has the error is highlighted and at the top of the list. Any queries that were before that query in the list have already been copied. You can do either of the following:

- Press F5 without pressing the Enter key. The copy process is canceled for all remaining queries, including the query in error. You return to the Work with Queries display.
- Press F20 without pressing the Enter key. The query in error is not copied. To continue copying the remaining queries, press Enter. If an error is found while copying one of the remaining queries, another error message is shown and the list is shown again with that query listed first and highlighted.

---

## Renaming a Query Definition

If you want to rename a query, do the following:

1. Copy the query, giving the copied query a new name.
2. Delete the original query.

These tasks are options on the Work with Queries Display and are described in other sections of this chapter.

## Deleting a Query Definition

When you no longer need a query, you can delete (remove) it from the library. Once you delete a query, you cannot get it back, so it is a good idea to check a query definition before you delete it. If you delete a query from the Work with Queries display, you can use F11 to display text about the query. If there is no text, or if it does not include enough information to help you, you can display the query definition or you can print the query definition. These tasks are described later in this chapter.

You can delete a previously saved query by:

- Using the DLTQRY (Delete Query) command. For more information on using the DLTQRY command, see the *CL Reference* manual.
- Selecting option 3 (Delete a query) on the Query menu. This causes the DLTQRY (Delete Query) command help display to appear. For more information on using the DLTQRY command, see the *CL Reference* manual.
- Using option 4 (Delete) on the Work with Queries display. You can type the name of the query (and its library) on the display, or you can, from a list of queries, type a 4 next to the query(s) that you want to delete. (For more information about using lists, see “Using Lists” on page 2-4.) Then press the Enter key. The Confirm Delete of Queries display appears.

Confirm Delete of Queries

From library . . . . : MYLIB

Press Enter to confirm your choices to delete.  
Press F12=Previous to return to change your choices.

Query  
ACCTRECJAN  
INVENTJAN  
MAILADDR  
PAYROLLJAN  
TESTQUERY1  
TESTQUERY2

F9=Reset      F12=Previous      F20=Cancel delete in error

This display shows the query name(s) you chose to delete. (The above display shows some sample information.) Carefully check the names.

If you are sure you want to delete the queries listed, press the Enter key. The queries are deleted and you return to the Work with Queries display. The list of queries for the selected library is displayed and the deleted query name(s) are no longer included.

If you decide you do not want to delete one of the queries shown, press F12 to return to the Work with Queries display without deleting any queries. The list of queries is still displayed and you can change any of your selections.

If Query finds an error while deleting the queries, the list of queries being deleted is shown and an error message appears on the bottom of the display. The query that has the error is highlighted and at the top of the list. Any queries that were before that query in the list have already been successfully deleted. You can do either of the following:

- Press F9 without pressing the Enter key. The delete process is canceled for all remaining queries, including the query in error. You return to the Work with Queries display.
- Press F20 without pressing the Enter key. The query in error is not deleted, but the delete process continues for the remaining queries. If an error is found while deleting one of the remaining queries, another error message is shown and the list is shown again with that query listed first and highlighted.

---

## Displaying a Query Definition

When you display a query, Query does not allow you to make any changes. If you display a query and decide you want to change it, you have to return to the Work with Queries display and use option 2 (Change).

**Note:** If you are not authorized to change a query, you may not be allowed to display it.

You can print the information you see when you display a query, although the information will be in a different form. See “Printing a Query Definition” later in this chapter.

You can display a previously saved query by using option 5 (Display) on the Work with Queries display. You can type the name of the query (and its library) on the display, or you can, from a list of queries, type a 5 next to the query that you want to display. (For more information about using lists, see “Using Lists” on page 2-4.)

After you press the Enter key, the Define the Query display appears. All the options that were defined for the query are shown with a “>” to the left of the option. To look at how the options are defined, you can either:

1. Use F21 to look at displays for all the options (even those that are not defined for this query).
2. Type a 1 in the *Opt* column beside the options you want to look at.

You can press F5 while displaying a query to see how a report would look if you ran the query and displayed or printed a report.

When you have finished looking at a display for an option and are ready to look at the displays for the next option, press the Enter key. When you have seen displays for all the options you selected, you return to the Define the Query display. You can look at the same options again, or choose to display different options. Whenever you decide you are finished displaying this query definition, you can either:

1. Press F12 as many times as necessary to return to the Work with Queries display.
2. Press F3 to work with any remaining queries, if you selected more than one query from a list on the Work with Queries display. You return to the Work with Queries display if you were finished working with all the queries you selected on that display.

**Note:** You may not be able to display a query if the file definition has been changed since the query was last used or displayed. Changing the query or the file definition may make it possible to display the query. You also may not be able to use certain command and function keys while you are displaying because they are available only when you create or change a query.

---

## Printing a Query Definition

You can print the query definition. The printout tells you what information the query uses to prepare a report or create a file. You can see the same information on your display by selecting option 5 (Display) on the Work with Queries display, but the information will be in a different form.

You can print the query definition using any of the following methods:

- Use option 6 (Print definition) on the Work with Queries display. You can type the name of the query (and its library) on the display, or you can, from a list of queries, type a 6 next to the query name that you want to print the definition for. (For more information about using lists, see “Using Lists” on page 2-4.)
- Specify to print the definition on either the Define Printer Output display or the Define Data Base File Output display and then run the query. These displays are described in Chapter 13.
- Specify to print the definition when you use the RUNQRY command to run the query. For more information on the RUNQRY command, see “Using the RUNQRY Command” on page 15-7.

When you select option 6 (Print definition) on the Work with Queries display and press the Enter key, the query definition is printed immediately.

## Information Printed for a Query Definition

The printout includes the following information:

- A header at the top of each page. This header lists information about the system you are using and when the definition was printed.
- The query name.
- The library name.
- Any text about the query.
- The collating sequence and translate table used.
- The processing options.
- The file identifier(s). For each file identifier, the printout includes the following:
  - The file name
  - The name of the library
  - The name of file member
  - The record format selected for the file
- The join tests, if more than one file is used, and the type of join used.
- Any result fields, their expressions, length and decimal positions, and column headings.
- Record selection tests.

- Selected fields, their sequence, sort priority and sort type, and any text.
- Column formatting and summarizing.
- Any report breaks.
- The selected output type:
  - If the report is to be printed, printer information is shown.
  - If the output is to be put in a data base file, data base file information and the field layout are shown.
- The form of output selected, detailed or summary only.

If you print the definition using option 6 (Print definition) on the Work with Queries display, the printout includes information about any output type selected for the query. For example, if data base file output was selected when the query was created and the query was later changed so that the output is to be printed, the printout of the query definition would include both data base file and printer information. If you print the definition using any method except option 6, only current information is printed.

If you print the query definition while using the RUNQRY command, the information in the printed definition reflects any temporary changes that you specify using the RUNQRY parameters. For example, you might specify an input file name, make changes to the record selection tests, or specify a different type of output.

In addition to information about the query definition, if the query produces output to a data base file, a description of the record format layout is also printed.

## Example of Printed Record Format Information for a Query

The following is an example of one particular part of the query definition (the record format layout for the data base output file) that can be printed when the query is run. The information shown below is printed only if the query is defined for data base file output and, in this case, when it sends summary-only output to the data base file.

Output file record format

Output record length . . . . . 65

Field list:

Field	Begin	Len	Dec	Data Type	Text
BREAKLVL		1		Character	Break Level
OVERFLOW	1	1		Character	Overflow Flag
FMT	2	1		Character	Record ID for record format
FMT03	3	1		Character	FMT MIN
FMT04	4	1		Character	FMT MAX
NAME	5	11		Character	Name (comment)
NAME04	16	11		Character	NAME MAX
NAME05	27	7	0	Zoned decimal	NAME COUNT
FMT06	34	1		Character	Record ID for record format
NAME06	35	11		Character	Name (comment)
NAME07	46	7	0	Zoned decimal	NAME COUNT
EMAN03	53	12		Character	EMAN MIN

- The *Field* column shows the fields that exist in the output records. Each data field in the record output is assigned a name equal to the field name as it exists in the query definition. If two or more fields in the record output have identical field names (this occurs if one or more summary functions are specified for a

field or when files are joined), the first six characters of the field name are used plus a two-digit number is added that corresponds to the summary function (01=Total, 02=Average, 03=Minimum, 04=Maximum, and 05=Count).

For example, minimum and maximum summary functions are specified in the query definition for the FMT field; therefore, two fields named FMT03 and FMT04 appear in the record output (see above) and they contain the minimum value for the FMT field (FMT03) and the maximum value for the FMT field (FMT04).

- The *Begin* column shows the starting byte of the field within the record. For example, the field named EMAN03 starts at byte 53.
- The *Len* and *Dec* columns show the length and decimal positions for each field. For example, the field named NAME05 has a length of seven with zero decimal positions.
- The *Data Type* column shows the data type for each field.
- The *Text* column shows the comment (if it exists) for each field. If the field is for a summary function, the text shown is the field name (without any added numbers) followed by the type of summary function.





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## Part 3. Advanced Information on Query

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## Chapter 17. Additional Information for Programmers

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### Files with Different Record Formats

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You can use a file that has more than one record format; however, you can use only one record format at a time. If an application you are designing requires concurrent processing of different record formats in the same file, you should consider using a programming language such as RPG or COBOL.

For example, if customer names are in one record format and the amount each customer owes is in a different record format in the same file, a single query cannot print the names of all customers who owe more than \$500. For Query to select records from both record formats, the selection criteria—customer name and amount owed—must exist in one record format (that is, the physical disk record must reflect both customer name and amount owed fields).

**Note:** This could be accomplished in a single query by joining the file to itself. However, the record formats must all contain a common field. For more information on joining files, see “Joining Files” on page 4-11.

### File Sharing Considerations

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Other application programs can read and update a file at the same time Query is creating a report from the file, and two or more Query definitions can refer to the same file at the same time.

### Overriding Data Base Files

---

Your query run results may be unpredictable if you use the OVRDBF (Override with Data Base File) command to override a data base file. Query allows you to use the OVRDBF command, but problems may occur because record formats and file members selected for the overridden file may not correspond to the new file.

### DBCS Considerations When Defining Result Fields

---

If you use the SUBSTR operator on any DBCS field, the result field will be a character field.

If you concatenate DBCS-only fields and/or DBCS-only constants, the result field will be a DBCS-only field.

If you concatenate a DBCS field and/or a DBCS constant with a character field and/or a character constant, the result field will be a DBCS-open field.

---

## Joining Files

For joining files (type of join):

- Type 1 join is the same as for Query/36.
- Type 2 join is the same as a partial outer join.
- Type 3 join is the same as an exception join.

## Using \*ALL

You can use \*ALL for your join if your join relationships are so complicated that record selection tests have to be used instead of join tests or when you are creating a data base file with field extension using a one-record pad file.

---

## Using Field Other Than Sort Fields for Report Breaks

The fields you use for sorting may not be meaningful in a report, so you may want to use fields other than sort fields for break fields. For example, a field containing the customer name portion of a mailing label may be used as the break field, while an arbitrarily assigned (also unique) customer ID is used for sorting. Since customer name is a break field, it can be inserted in break text or placed in a summary-only data base file.

---

## Result Field Length and Decimal Positions

Query determines the length and number of decimal positions for result fields when it creates them in the report. These values are satisfactory for most users. The following section describes the rules that Query uses to determine these values. The section also suggests when, and how, the user should specify length and decimal positions. See also "Length and Decimal Positions" on page 10-2 for further considerations.

### Case 1: Two Numeric Constants or Fields

The following discusses adding, subtracting, multiplying, and dividing two numeric constants (the *same* two constants). Although the same rules apply when using *fields* in calculations, all of these examples use numeric constants for simplicity.

You can see the layout for these result fields by pressing F13 (Layout) on the Define Result Fields display after you have typed the definitions. The layout shows the length and number of decimal positions, *not* the value of the result field. The *integer length* is the length of the part of the number to the left of the decimal point; for example, a layout of 999.9 has an integer length of 3.

### Addition and Subtraction

When addition or subtraction is performed to get a result:

- The number of *decimal positions* in the result field is equal to the maximum number of decimal positions in the numbers being added or subtracted.
- The *integer length* of the result field is one more than the maximum integer length of the numbers being added or subtracted.

Name of Result Field	Value 1	Operation	Value 2	Report Field Layout
RESULT1	-789	+	-890	9999
RESULT2	1234.000	-	55.6	99999.999

The four-position layout for RESULT1 contains an integer length of 4 and no decimal positions. The nine-position layout for RESULT2 contains an integer length of 5 and three decimal positions.

## Multiplication

When multiplication is performed to get a result:

- The number of *decimal positions* of the result field is equal to the sum of the number of decimal positions of the numbers being multiplied.
- The *integer length* of the result field is equal to the sum of the integer lengths of the numbers multiplied.

Name of Result Field	Value 1	Operation	Value 2	Report Field Layout
RESULT3	-789	*	-890	999999
RESULT4	1234.000	*	55.6	999999.9999

The six-position layout for RESULT3 contains an integer length of 6 and no decimal positions. The 11-position layout for RESULT4 contains an integer length of 6 and four decimal positions.

## Division

When division is performed to get a result:

- The number of *decimal positions* of the result field is equal to the maximum number of decimal positions in the two numbers used in the division. For division, result fields always have at least two decimal positions. However, if the created result field is very large (for example, 31 digits long), there may be *no* decimal positions. See “Very Large Result Fields” on page 17-4.)
- The *integer length* of the result field is equal to the sum of: the integer length of the number being divided plus the number of decimal positions in the number that divides. For result field RESULT6, the number being divided, 1234.000, has an integer length of 4. The number that divides, 55.6, has one decimal position. Therefore, RESULT6 has an integer length of 5, the sum of 4 plus 1.

Name of Result Field	Value 1	Operation	Value 2	Report Field Layout
RESULT5	-789	/	-890	999.9999
RESULT6	1234.000	/	55.6	99999.99999

The six-position layout for RESULT5 contains an integer length of 3 and two decimal positions. The nine-position layout for RESULT6 contains an integer length of 5 and three decimal positions.

Case 2: More Than Two Numeric Constants or Fields

The following examples describe result fields that are created using either more than two values or very long values in the numeric expression.

More Than Two Values

When multiple values are used in an expression, Query does the first partial calculation, determining the length for that step, and then continues to the next partial calculation. For example, RESULT7 has three values in the expression:

Result Field	Values and Operands	Layout
RESULT7	5 * 3 * 4	999

Query performs the first partial calculation (5 \* 3) and gets an intermediate result of 15, which has a length of 2 according to the previous rules. Then Query multiplies the intermediate result of 15 by 4 to give RESULT7 a value of 60. According to the rules, RESULT7 has an integer length of 3 because it is equal to a number with a length of 2 times a number with a length of 1. If RESULT7 equals 0 \* 0 \* 0, it still has a length of 3 because the rules use the length and decimal positions of numbers and fields, not their values.

In general, every complex calculation is done in a series of steps, each producing intermediate results. By looking at each step, the user can determine the length and decimal positions of the intermediate results, and thus of the final result.

Very Large Result Fields

The maximum length for any result field is 31 digits. Here are two examples that use very long constants in the expression defining the result fields:

Result Field	----- Values and Operands -----
RESULT8	1234567890123456789012345 * 123456
RESULT9	123456789012345678901234567890 * 123456789012345678901234567890 * 1E0

For RESULT8, the rules say that the integer length should be 30 with five decimal positions. But this would mean a total length of 35, which is too long. Therefore, Query keeps the integer length of 30 and decreases the number of decimal positions to one, making a total length of 31.

For RESULT9, you should specify (on the Define Result Fields display) a value of 17 in the *Len* column and a value of 16 in the *Dec* column.

Tips for Dealing with Length and Decimal Positions

In certain situations, the length that Query determines for the result field is larger than necessary. For example, for result field RESULT10:

Result Field	--- Values and Operands ---	Layout
RESULT10	9 + 9 + 9 + 9 + 9	999999

Query assigns length 6 to result field RESULT10. Since the result in RESULT10 is 45, only a length of 2 is needed. You could specify a 2 in *Len* column and a 0 in the *Dec* column on the Define Result Fields display for this result field.

Similarly, for result field RESULT11:

Result Field	--- Values and Operands ---	Layout
RESULT11	N1 + N2 + N3 + N5 + N5	99999

If fields N1 through N5 each have a length of 1, Query assigns a length of 5 to RESULT11, but a length of 2 is long enough.

In calculations involving many large fields, you can control your results better by breaking the expression into parts, calculating each part as a separate result field. Then you can use these result fields in an expression to calculate the result field you want. You can specify length and decimal positions for the intermediate result fields to minimize the length of the final result field.

For example:

$$X12 = (1.2998 - P - Q) / ((R + S) * (T - U)) + 6$$

Instead of defining result field X12 in one step as above, you could do it in three:

$$X12PART1 = 1.2998 - P - Q$$

$$X12PART2 = (R + S) * (T - U)$$

$$X12 = X12PART1 / X12PART2 + 6$$

If the user knows that X12PART1, for example, is always a number between 0 and 1.2998, the user can specify 5 for *Len* and 4 for *Dec* (on the Define Result Fields display) for X12PART1. This decreases the length of X12.





---

## Appendix A. Differences Between AS/400 Query and Query/36

This appendix describes the differences between AS/400 Query and Query/36. The Query differences described in this appendix are limited to the differences that may cause you some inconvenience if you did not know about them before working with AS/400 Query. This appendix defines these differences as:

- Conceptual
- Operational
- Command

---

### Conceptual Differences

The following list identifies the concept that is different on the AS/400 system along with an explanation of the differences as it applies to the listed concept.

Subroutines	Queries were subroutine members in a library on the System/36. On the AS/400 system, queries are a unique object type called a query definition (*QRYDFN) stored within a library. This change is important to understand since some System/36 commands that work with subroutines may not work on the AS/400 system.
-------------	---

---

### Operational Differences

The following list identifies the operations that are different on the AS/400 system along with an explanation of the differences as it applies to each listed item.

Linked files	If an IDDU-defined file that is migrated from the System/36 is not linked, you can still run a query against the file. However, the file will show as a one-field file (that is, if you were to run a default query against the file, the file would appear as though all of the fields were run together).
File IDs	In Query/36, file IDs are one of the letters A through E. If a Query/36 query is migrated to the AS/400 system, all file IDs for files selected for that query remain the same. All files selected for a query on AS/400 Query will have a one- to three-character file ID that you specify, or it will default to <i>Tnn</i> , where <i>nn</i> is in the range of 1 to 32.
Joining files	In Query/36, you can join up to five files, and only one type of file join (matched records) is allowed. In AS/400 Query, you can join up to 32 files, and three types of file join are allowed: <ul style="list-style-type: none"><li>• Matched records</li><li>• Matched records with primary file</li><li>• Unmatched records with primary file</li></ul>

Character fields	In Query/36, character fields that were defined in IDDU with a length greater than 256 bytes were truncated at 256 bytes. AS/400 Query supports character fields up to 32,766 bytes in length. Record selection tests that use these fields will now use the entire field for the comparisons instead of just the first 256 bytes.
Sort sequence	If no sorting was specified in the query, the order in which records are printed in the report may be different than the order they were printed in Query/36. Also, if sorting is specified but the field(s) being sorted contain the same value in multiple records, the order in which these records appear may be different from Query/36.
Result fields	Result fields that use multiplication or division operations in AS/400 Query may have a slightly different result in the rightmost decimal positions as compared to Query/36. This occurs because multiplication and division are carried out to a much greater precision in AS/400 Query.
Calculation results	The results of multiplication and division operations are truncated according to the field length for queries that are migrated from the System/36. For queries defined using AS/400 Query, you can specify that the results of multiplication and division operations be either truncated or rounded.
Output to file	When the output of a query is being sent to a file, AS/400 Query will build the file as a data base file with a definition. It is no longer necessary to build the IDDU definition and link that definition to the file as was needed on Query/36.
Summary-only output	When sending summary-only output to a file using AS/400 Query, each report break field whose break level number is greater than the break level that this record was generated for will contain blanks for character fields and zeros for numeric fields. On System/36, these fields contained binary zeros. The AS/400 system operates this way to avoid putting incorrect data into numeric fields.
Library default	The library default for the input file on the Specify File Selections display and the output file on the Define Data Base File Output display is the library that was set up at configuration time for the System/36 environment files.

---

## Command Differences

The following table lists the System/36 Query commands and the equivalent AS/400 system commands (if appropriate) plus some system commands that work with queries.

System/36	AS/400 System
QRY	WRKQRY
QRYRUN	RUNQRY

REMOVE	DLTQRY
FROMLIBR	SAVOBJ
HELP QUERY	STRQRY
LIBRLIBR	CRTDUPOBJ
TOLIBR	RSTOBJ



## Appendix B. Practice Exercise for Query

To do an exercise using query, you must first have a file set up with some data. This exercise steps you through the following before you actually create a query:

- Creating an IDDU definition
- Creating a data base file
- Entering data

If you already have a file on the system with data that you can use, you may want to skip directly to the section on creating a query. If you do not care what type of data you are working with, you can create a query that uses data from the QGPL library. This exercise is described in the last section of this appendix, “Creating an Advanced Query” on page B-19.

---

### Creating an IDDU Definition

In the following example, you are shown how to create the definitions for a name and address file. The definitions are structured to be used with the work you can do in the Data/Text Merge task in the *Word Processing Learning Guide* and the data file utility task in the *DFU User's Guide/Reference*.

1. You can type STRIDD (for the Start IDDU command) on any command line. Or you can go to the IDDU main menu by choosing the IDDU option from either the Files menu or the Decision Support menu. The Decision Support menu appears if you select option 2 (Office tasks) on the AS/400 Main Menu and then option 3 (Decision support) on the Office Tasks menu.
2. Create a data dictionary by choosing option 2 (Work with data dictionaries) on the IDDU menu and pressing the Enter key. (You do not need to do this if one exists in a library you can use. If a data dictionary exists that you can use, go to step 6 on page B-2.)
3. Choose option 1 (Create) on the display, type the name of the library that will contain the dictionary, and press the Enter key.

If you attempt to create a data dictionary and the named library does not exist, a message is displayed that says Library not found. Press Enter to create. If you press the Enter key, you will see the Create Library display. From this display you can create the library that will contain the data dictionary. When you finish creating a library, you will continue to the Create Data Dictionary display.

4. On the Create Data Dictionary display, the name of the library appears as the name of the dictionary. Later in this exercise, we will use a dictionary name of SYSDIC; you can replace SYSDIC with the name of another dictionary.

5. You can accept the system-supplied values and press the Enter key. You also can type a brief description in the *Text* prompt and choose to enter a long comment. If you type 1 (Select) in the *Long comment* prompt, you are shown the Edit Long Comment display where you can type detailed information about the dictionary. The dictionary is created when you end your work and press Enter on that display.

The AS/400 system can take some time to create the dictionary; it shows you a message when the dictionary has been created. Then press F12 (Previous) on the Work with Data Dictionary display to return to the IDDU main menu.

6. Choose option 1 (Work with data definitions) on the IDDU main menu,

```
Interactive Data Definition Utility IDDU

Select one of the following:

    1. Work with data definitions
```

and press the Enter key.

7. You will name the file definition first, so select option 3 (File). (The name SYSDIC appears in the *Data dictionary* prompt on the following display; what you see on your display is the name of the data dictionary you just created, or the name of the data dictionary you last used. You may change the data dictionary if you want.)

```
Select Definition Type

Type choices, press Enter.

Definition type . . . . . 3          1=Field
                                         2=Record format
                                         3=File

Data dictionary . . . . . SYSDIC      Name, F4 for list
```

Then press the Enter key.

8. When you see the Work with File Definitions display, choose option 1 (Create) and name the new file definition. (We have used NAMEADDR as an example of a file definition name.)

```
Work with File Definitions

Dictionary . . . . . : SYSDIC

Type choices, press Enter.

Option . . . . . 1          1=Create, 2=Change
                             3=Copy, 4=Delete
                             6=Print, 7=Rename
                             8=Display where used

File definition . . . . . NAMEADDR  Name, F4 for list
```

Then press the Enter key.

9. When you see the Create File Definition display, select option 2 (Create single format) and accept the system-supplied record format name (the system uses the file definition name and adds the letter R to the end). You can type brief descriptive information in the *Text* prompt, as we have. Do not specify anything in the *Long comment* prompt.

```

                                Create File Definition

Definition. . . . . : NAMEADDR      Dictionary. . . . . : SYSDIC

Type choices, press Enter.

Record formats . . . . 2           1=Create and select formats
                                   2=Create single format

New record format . . NAMEADDRRR   Name

Long comment . . . . . _           1=Select, 2=Remove

Text . . . . . practice definition for DFU and Query

```

Then press the Enter key.

10. You are now ready to create the field definitions that will be used by the record format definition you just named. Name the first field definition by typing LASTNAME in the *Field* prompt. Use the sequence number 10 that is already supplied on the display. Do not press Enter yet.

```

                                Create and Select Field Definitions

Definition. . . . . : NAMEADDRRR    Dictionary. . . . . : SYSDIC

Type sequence numbers (0-99999), (and Field), press Enter.
Press F6 to create.

Seq   Field
10    LASTNAME

```

Now press F6. You will complete the description of the LASTNAME field definition (as well as naming and describing the rest of the field definitions) from the next display.

11. Complete the LASTNAME field description with its type, size, and any other descriptors, according to the table shown below. Then name and describe the rest of the field definitions.

Field Name	Field Type	Size	Text
LASTNAME	Character	15	Last name
FIRSTNAME	Character	10	First name
ADDRESS1	Character	20	Address line 1
ADDRESS2	Character	20	Address line 2

Field Name	Field Type	Size	Text
CITY	Character	15	City
STATE	Character	2	State
ZIP	Character	9	Zip code
AMOUNT	Numeric, 2 decimal positions	6	Amount

```

Create Field Definitions

Type information, press Enter to create.

Field type . . . : 1=Character, 2=Numeric, 3=DBCS
Field size . . . : 1-32766 (character), 1-31 (numeric), 4-32766 (DBCS)
Decimal positions: blank (character), 0-31 (numeric), blank (DBCS)
More options. . . : Y=Yes

-----Field----- Dec More
Name      Type Size  Pos Opt  Text

LASTNAME  1   15   --      Last name
FIRSTNAME 1   10   --      First name
ADDRESS1  1   20   --      Address line 1
ADDRESS2  1   20   --      Address line 2
CITY      1   15   --      City
STATE     1    2   --      State
ZIP       1    9   --      Zip code
AMOUNT    2    6   2      Amount

```

12. When you have completed specifying the field characteristics, press the Enter key. The Create Field Definitions display is shown again; your fields have been created.

```

Create Field Definitions

Type information, press Enter to create.

Field type . . . : 1=Character, 2=Numeric, 3=DBCS
Field size . . . : 1-32766 (character), 1-31 (numeric), 4-32766 (DBCS)
Decimal positions: blank (character), 0-31 (numeric), blank (DBCS)
More options. . . : Y=Yes

-----Field----- Dec More
Name      Type Size  Pos Opt  Text

-----
-----
-----

```

Press the Enter key without making any changes to the display.



13. When you see the Create and Select Field Definitions display,

```

                                Create and Select Field Definitions
Definition.....: NAMEADDR      Dictionary.....: SYSDICT
Position to . . . . .          Field, Sequence (0-99999)
Type sequence numbers (0-99999), (and field), press Enter.
Press F6 to create.

Seq   Field      End
10    LASTNAME   15
10    FIRSTNAME  25
10    ADDRESS1   45
10    ADDRESS2   65
10    CITY       80
10    STATE      82
10    ZIP        91
10    AMOUNT     95

```

verify that the field names are arranged in the proper sequence. (When sequence numbers are the same, the arrangement of the field names on the display determines the sequence of use in the record.) If a field is out of sequence, type the necessary sequence numbers to indicate the correct arrangement, and press the Enter key. When the fields are in the proper sequence, press the Enter key without making any changes to the display.

14. You will then see the Work with File Definitions display where

```

                                Work with File Definitions
Dictionary. . . . . : SYSDICT
Type choices, press Enter.

Option. . . . . _      1=Create, 2=Change
                        3=Copy, 4=Delete
                        6=Print, 7=Rename
                        8=Display where used

File definition . . . . . NAMEADDR  Name, F4 for list

```

you press the Exit function key without making any changes to the display.

You are finished creating the definitions *describing* a data base file. The instructions to *create* the file and to enter data into the file are described in the following sections.

---

## Creating a Data Base File

After you have completed creating the necessary file definitions, you can create the data base file using the Work with Data Base Files display. You can get to this display either from the main IDDU menu, or by entering the WRKDBFIDD command.

You can create as many files as you require by entering a new file name each time you return to the display. These file names might have a level of authority previously assigned to them (authority holder). This affects the authority that you can assign.

To create a data base file, do the following:

1. Choose option 3 (Work with data base files) from the IDDU menu (or type WRKDBFIDD on a command line).

2. On the Work with Data Base Files display, choose option 1 (Create), name the new file, and specify the library that will contain the file.

```
Work with Data Base Files

Type choices, press Enter.

Option..... 1          1=Create, 2=Enter data
File..... NAMEADDR    Name, F4 for list
Library..... YOURLIB   Name, *CURLIB, F4 to list
```

3. Press the Enter key. The Create Data Base File display is shown with the names of the new file and its library.

On this display, specify NAMEADDR for the file definition, SYSDIC for the dictionary (or the name of the dictionary you created in the previous section of this appendix), and \*CHANGE for the authority others have to this file.

```
Create Data Base File

File . . . : NAMEADDR          Library . . . : YOURLIB

Type choices, press Enter.

Related definition information:

File definition . . . . . NAMEADDR    Name, F4 for list
Dictionary . . . . . SYSDIC          Name, F4 for list
Authority . . . . . *CHANGE          *ALL, *CHANGE, *USE, *EXCLUDE
                                         authorization list name
```

4. Press the Enter key to create the file. When the file is created, the system automatically links the file to its file definition.

Press F3 (Exit) to return to the IDDU menu.

---

## Entering Data

To enter data into the file, do the following:

1. Choose option 3 (Work with data base files) from the IDDU menu (or type WRKDBFIDD on a command line).
2. On the Work with Data Base Files display, specify option 2 (Enter data), NAMEADDR for the file name, and your library for the library name.

```
Work with Data Base Files

Type choices, press Enter.

Option..... 2          1=Create, 2=Enter data
File..... NAMEADDR    Name, F4 for list
Library..... YOURLIB   Name, *CURLIB, F4 to list
```

3. Press the Enter key; the Work with Data in a File display is shown.

WORK WITH DATA IN A FILE		Mode . . . . : ENTRY
Format . . . . :	NAMEADDR	File . . . . : NAMEADDR
LASTNAME:		
FIRSTNAME:		
ADDRESS1:		
ADDRESS2:		
CITY:		
STATE:		
ZIP:		
AMOUNT:		
F3=Exit	F5=Refresh	F6=Select format
F9=Insert	F10=Entry	F11=Change

4. Type the information shown on the following display, but do not press the Enter key. After you have typed in the amount, press the Field Exit key first and *then* press the Enter key.

WORK WITH DATA IN A FILE		Mode . . . . : ENTRY
Format . . . . :	NAMEADDR	File . . . . : NAMEADDR
LASTNAME: SIMPSON		
FIRSTNAME: FRANK		
ADDRESS1: 1722 ORANGE STREET		
ADDRESS2:		
CITY: RIDGEWAY		
STATE: CA		
ZIP: 72430		
AMOUNT: 9998		
F3=Exit	F5=Refresh	F6=Select format
F9=Insert	F10=Entry	F11=Change .

5. The Work with Data in a File display is shown again, but the fields are blank, ready for you to continue adding more data.
6. Continue adding the following data to the Work with Data in a File display:

Daye  
Ben  
1312 Elm Street  
Apt C  
Marshall  
AK  
77901  
456

Sedgewick  
Lillian  
200 Park Lane  
Emmerson  
LA  
71282  
25

Lien  
Sue  
469 Jackson Street  
Ridgeway  
CA  
72430  
00

Patterson  
Tammy  
4 Ridgeview Court  
Marshall  
AK  
77901  
501

Skoggen  
Linda  
Circle Court NE  
Truman  
NC  
57432  
764

Sedgewick  
Leona  
21st Cannery Row  
Apt 43  
Emmerson  
LA  
71282  
45

Barker  
Rick  
1432 Le Grand Blvd  
Emmerson  
LA  
71282  
938

Golinero  
Sebastin  
7196 Thomas Street  
Highpoint  
MN  
55909  
00

Skoggen  
Charles  
401 Abbey Road  
Truman  
NC  
57432  
629

7. After you have added all your data and the Work with Data in a File display is shown with blank fields, press F3 (Exit). The End Data Entry display is shown.

End Data Entry	
Number of records processed	
Added . . . . .	10
Changed . . . . .	0
Deleted . . . . .	0
Type choice, press Enter.	
End data entry . . . . .	Y Y=Yes, N=No

You do not need to change anything on this display; press the Enter key.

8. The Work with Data Base Files display is shown.

Work with Data Base Files		
Type choices, press Enter.		
Option.....	_	1=Create, 2=Enter data
File.....	NAMEADDR	Name, F4 for list
Library.....	YOURLIB	Name, *CURLIB, F4 for list
F3=Exit F4=List F12=Previous		
F21=Work with definitions F22=Work with data dictionaries		
Data for file NAMEADDR in YOURLIB was changed.		

A message on the bottom of the display tells you that data in your file was changed.

9. Press F3 (Exit) and you are shown the menu that you started from.

An audit log is automatically printed showing all the data you entered.

---

## Creating and Running a Query

In the following exercise, you will create and change a query that produces a report that lists all the information in the file NAMEADDR or any other file that may already exist on your system. NAMEADDR is a file definition that you created in the previous example using IDDU.

NAMEADDR contains names and addresses and includes the following information:

- Last name
- First name
- Address 1
- Address 2
- City
- State
- Zip Code
- Amount

After you create and save the query, you will run it as it exists and then change the query and run it again.

### Creating a Query

In this exercise, you will create a query that lists on your display all the information in the file NAMEADDR in the order the information exists in the file.

This exercise asks you to save the query you create in a library. You will probably want to use your own library. If you do not have a library or do not know how to create one, see the person responsible for libraries on your system.

1. Go to the Work with Queries display by typing WRKQRY on any command line.
2. On the Work with Queries display type a 1 (Create) for the *Option* prompt, xxxQRY for the *Query* prompt (using your initials instead of xxx), and the name of your library for the *Library* prompt.

Work with Queries

Type choices, press Enter.

Option . . . . . 1

1=Create, 2=Change, 3=Copy, 4=Delete  
5=Display, 6=Print definition  
9=Run

Query . . . . . KJQORY

Name, F4 for list

Library . . . . . YOURLIB

Name, \*LIBL, F4 for list

F3=Exit

F4=List

F5=Refresh

F12=Previous

+ None

- Press the Enter key; the Define the Query display is shown.

Define the Query

Query . . . . . : KJQORY

Option . . . . . : CREATE

Library . . . . . : YOURLIB

Type options, press Enter. Press F21 to select all.

1=Select ('>' identifies previously defined options.)

Opt

Query Definition

Option

1

Specify file selections

-

Define result fields

-

Select and sequence fields

-

Select records

-

Select sort fields

-

Select collating sequence

-

Specify report column formatting

-

Select report summary functions

-

Define report breaks

-

Select output type and output form

-

Specify processing options

F3=Exit

F5=Report

F12=Previous

F13=Layout

F18=Files

F21=Select all

Notice that Query has already supplied a 1 for the *Specify file selections* option on this display. This is because whenever you create a query, you *must* specify a file, but you do not have to select any other options on this display.

- Press the Enter key and the Specify File Selections display is shown.

Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .		Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	*FIRST	Name, *FIRST, F4 for list

F3=Exit

F4=List

F5=Report

F9=Add file

F12=Previous

F13=Layout

F18=Files

+ F10

This display is where you tell Query what data base file(s) you want to query for the data in your report.

- Type NAMEADDR for the *File* prompt, the library that contains the file for the *Library* prompt, and leave the *Format* and *Member* prompts as they are shown.

Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .	NAMEADDR	Name, F4 for list
Library . . . . .	YOURLIB	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	NAMEADDRR	Name, *FIRST, F4 for list

F3=Exit

F4=List

F5=Report

F9=Add file

F12=Previous

F13=Layout

F18=Files

- Press the Enter key. The Specify File Selections display is shown again with the message Select file(s), or press Enter to confirm. displayed at the bottom.



Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .	NAMEADDR	Name, F4 for list
Library . . . . .	YOURLIB	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	NAMEADDRR	Name, *FIRST, F4 for list

F3=Exit	F4=List	F5=Report	F9=Add file
F12=Previous	F13=Layout	F18=Files	

Select file(s), or press Enter to confirm.

7. Press the Enter key. The Define the Query display is shown with the message Select options, or press F3 to save or run the query. displayed at the bottom.

Define the Query

Query . . . . . : KJOQRY                      Option . . . . . : CREATE  
Library . . . . . : YOURLIB

Type options, press Enter. Press F21 to select all.  
1=Select ('>' identifies previously defined options.)

Opt	Query Definition Option
-	> Specify file selections
-	Define result fields
-	Select and sequence fields
-	Select records
-	Select sort fields
-	Select collating sequence
-	Specify report column formatting
-	Select report summary functions
-	Define report breaks
-	Select output type and output form
-	Specify processing options

F3=Exit	F5=Report	F12=Previous
F13=Layout	F18=Files	F21=Select all

Select options, or press F3 to save or run the query.

The Specify file selection option will have a > shown in the *Opt* column to indicate that it is a previously defined option.

8. Press F3 (Exit); the Exit This Query display is shown.

Query supplies a Y in the *Save definition* and *Run this query* prompts because it assumes you want to both save the query definition object and run the query. Leave the Y in both of these prompts.

9. Type Lists customer names and addresses for the *Text about the query* prompt.  
10. Leave \*CHANGE for the *Authority* prompt.



Work with Queries

Type choices, press Enter.

Option . . . . . \_

1=Create, 2=Change, 3=Copy, 4=Delete  
5=Display, 6=Print definition  
9=Run

Query . . . . . KJOQRY

Name, F4 for list

Library . . . . . YOURLIB

Name, \*LIBL, F4 for list

F3=Exit

F4=List

F5=Refresh

F12=Previous

Query option processing completed successfully.

## Changing a Query

If you want a report of only those customers who live in the state of Louisiana, you need to change the query to list customers from that state only.

1. Type a 2 (Change) for the *Option* prompt on the **Work with Queries** display.
2. Type xxxQRY (where xxx are your initials) for the *Query* prompt if xxxQRY is not shown as the query name.
3. Type the library name you used in the previous exercise for the *Library* prompt, if that is not the library name already shown.

Work with Queries

Type choices, press Enter.

Option . . . . . 2

1=Create, 2=Change, 3=Copy, 4=Delete  
5=Display, 6=Print definition  
9=Run

Query . . . . . KJOQRY

Name, F4 for list

Library . . . . . YOURLIB

Name, \*LIBL, F4 for list

F3=Exit

F4=List

F5=Refresh

F12=Previous

Query option processing completed successfully.

4. Press the Enter key; the Define the Query display is shown.
5. Type a 1 for the *Select records* prompt.

Define the Query

Query . . . . . : KJOQRY                      Option . . . . . : CHANGE  
Library . . . . . : YOURLIB

Type options, press Enter. Press F21 to select all.  
1=Select ('>' identifies previously defined options.)

Opt	Query Definition Option
>	Specify file selections
-	Define result fields
-	Select and sequence fields
1	Select records
-	Select sort fields
-	Select collating sequence
-	Specify report column formatting
-	Select report summary functions
-	Define report breaks
-	Select output type and output form
-	Specify processing options

F3=Exit  
F13=Layout

F5=Report  
F18=Files

F12=Previous  
F21=Select all

6. Press the Enter key; the Select Records display is shown.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Bottom

Field	Text	Len	Dec
LASTNAME	Last name	15	
FIRSTNAME	First name	10	
ADDRESS1	Address line 1	20	
ADDRESS2	Address line 2	20	
CITY	City	15	
		More...	

F3=Exit  
F12=Previous

F5=Report  
F13=Layout

F9=Insert  
F18=Files

F11=Display names only  
F20=Reorganize

The fields in the file NAMEADDR are listed on the bottom portion of this display. (If your display is not in single-column list format, that is the *Text*, *Len*, and *Dec* prompts are not shown, press F11.) You can move your cursor to any place in the list and press the Roll Up key to see more field names.

7. Complete the *Field*, *Test*, and *Value* columns on the display as follows:

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
 Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	STATE	EQ	'LA'

Bottom

Field	Text	Len	Dec
LASTNAME	Last name	15	
FIRSTNAME	First name	10	
ADDRESS1	Address line 1	20	
ADDRESS2	Address line 2	20	
CITY	City	15	

More...

F3=Exit	F5=Report	F9=Insert	F11=Display names only
F12=Previous	F13=Layout	F18=Files	F20=Reorganize

This tells Query to test the field named STATE in each record for the value LA. Only records with that value will be included in your report. (Make sure you type it as 'LA' because the apostrophes tell Query that LA is what the field contains and not the field name. You must also type this value in all uppercase letters because that is the way it is specified in the field.)

- Press F5 (Report) to run the query and show the report. F5 lets you see the effect your query changes have on the report before you actually save those changes.

The report appears listing only customers in Louisiana (only the *left* portion of the report is shown on the following display):

Display Report

Report width . . . . . : 117  
 Position to line . . . . . Shift to column . . . . .

Line	10	20	30	40	50	60	70
	LASTNAME	FIRSTNAME	ADDRESS1	ADDRESS2			
000001	SEDGEWICK	LILLIAN	200 PARK LANE				
000002	SEDGEWICK	LEONA	21ST CANNERY ROW	APT 43			
000003	BARKER	RICK	1432 LE GRAND BLVD				
***** End of Report *****							

Bottom

F3=Exit	F12=Previous	F19=Left	F20=Right	F21=Split
---------	--------------	----------	-----------	-----------

- Press F20 to display the *right* portion of the report.

Display Report							
Report width . . . . .					117		
Position to line . . . . .			Shift to column . . . . .				
Line	...50...	...60...	...70...	...80...	...90...	...100...	...110...
	ADDRESS2		CITY		STATE	ZIP	AMOUNT
000001			EMMERSON		LA	71282	.25
000002	APT 43		EMMERSON		LA	71282	.45
000003	VD		EMMERSON		LA	71282	9.38
***** End of Report *****							

Bottom

F3=Exit
F12=Previous
F19=Left
F20=Right
F21=Split

Last column of report.

10. Press F3 (Exit), F12 (Previous), or the Enter key to return to the Select Records display. Then press F3 (Exit); the Exit This Query display is shown.

Exit This Query		
Type choices, press Enter.		
Save definition . . . .	Y	Y=Yes, N=No
Run this query . . . .	Y	Y=Yes, N=No
For a saved definition:		
Query . . . . .	KJQORY	Name
Library . . . . .	YOURLIB	Name, F4 for list
Text about		
the query . . . .	Lists customer names and addresses	
Authority . . . . .	*CHANGE	*CHANGE, *ALL, *EXCLUDE, *USE authorization list name
F4=List                      F5=Report                      F13=Layout		
F14=Define the query		

You can use this display to run the query with the changes you made. You can also choose to make the query changes to be either permanent or for this one time only. Because you may never again want a report that lists only customers in Louisiana, you do not want to make the changes permanent. And, because you have already used F5 to run the query and see the report, you do not want to run the query again.

11. Fill in the Exit This Query display as follows:

Exit This Query

Type choices, press Enter.

Save definition . . . . N

Y=Yes, N=No

Run this query . . . . N

Y=Yes, N=No

For a saved definition:

Query . . . . . CEBQRY

Name

Library . . . . . YOURLIB

Name, F4 for list

Text about

the query . . . . .

List customer names and addresses

Authority . . . . . \*CHANGE

\*CHANGE, \*ALL, \*EXCLUDE, \*USE

authorization list name

F4=List

F5=Report

F13=Layout

F14=Define the query

12. Press the Enter key; the Work with Queries display is shown.

Work with Queries

Type choices, press Enter.

Option . . . . .

1=Create, 2=Change, 3=Copy, 4=Delete

5=Display, 6=Print definition

9=Run

Query . . . . . CEBQRY

Name, F4 for list

Library . . . . . YOURLIB

Name, \*LIBL, F4 for list

F3=Exit

F4=List

F5=Refresh

F12=Previous

Query option processing completed successfully.

To sign off the system or use it for something other than Query, press F3 (Exit) to return to the menu from which you chose to use Query.

## Creating an Advanced Query

In the following example, you will create a file named QRYFILE by using the DSPOBJD (Display Object Description) command. The file will contain descriptions of the all of the objects that currently reside in the QGPL library. Then, using several of Query's definition step options, you will create a query definition that obtains information from QRYFILE and creates a report showing that information.

**Note:** This examples does not explain the DSPOBJD command and its parameters. For additional information, see the *CL Reference* manual.

1. On the command line of the AS/400 Main Menu, type the DSPOBJD command as shown on the following display and press the Enter key. This creates the file named QRYFILE and puts it in the library QGPL.

**Note:** When you type \*ALL for the OBJTYPE parameter, you must include a space after \*ALL or you will receive an error message. You must type in the entire command *exactly* as it appears on the screen that follows.

```
MAIN                               AS/400 Main Menu                               System:  RCH38342

Select one of the following:

    1. User tasks
    2. Office tasks
    3. General system tasks
    4. Files, libraries, and folders
    5. Programming
    6. Communications
    7. Define or change the system
    8. Problem handling
    9. Display a menu

    90. Sign off

Selection or command
===> DSPOBJD OBJ(QGPL/*ALL) OBJTYPE(*ALL ) OUTPUT(*OUTFILE) OUTFILE(QGPL/QRYFIL
E)
F3=Exit  F4=Prompt  F9=Retrieve  F12=Previous  F13=User support
F23=Set initial menu

(C) COPYRIGHT IBM CORP. 1980, 1988.
```

2. Type WRKQRY on the command line and press the Enter key.

```
MAIN                               AS/400 Main Menu                               System:  RCH38342

Select one of the following:

    1. User tasks
    2. Office tasks
    3. General system tasks
    4. Files, libraries, and folders
    5. Programming
    6. Communications
    7. Define or change the system
    8. Problem handling
    9. Display a menu

    90. Sign off

Selection or command
===> WRKQRY

F3=Exit  F4=Prompt  F9=Retrieve  F12=Previous  F13=User support
F23=Set initial menu
```

3. The Work with Queries display is shown. On this display, choose option 1 (Create). Then name your query by typing a name in the *Query* prompt, and specify the library where your query will be stored by typing a name in the *Library* prompt. Press the Enter key.



```

                                Work with Queries

Type choices, press Enter.

Option . . . . . 1          1=Create, 2=Change, 3=Copy, 4=Delete
                              5=Display, 6=Print definition
                              9=Run
Query . . . . . QNAME      Name, F4 for list
Library . . . . . YOURLIB  Name, *LIBL, F4 for list

F3=Exit      F4=List      F5=Refresh      F12=Previous
(C) COPYRIGHT IBM CORP. 1988

```

4. On the Define the Query display, select definition steps *Select and sequence fields*, *Select records*, *Select sort fields*, *Specify report column formatting*, *Select report summary functions*, and *Define report breaks* by typing a 1 to the left of each of them. (Notice that *Specify file selections* is already selected for you.) Press the Enter key.

```

                                Define the Query

Query . . . . . : QNAME          Option . . . . . : CREATE
Library . . . . : YOURLIB

Type options, press Enter. Press F21 to select all.
1=Select ('>' identifies previously defined options.)

Opt  Query Definition Option
1    Specify file selections
      Define result fields
1    Select and sequence fields
1    Select records
1    Select sort fields
      Select collating sequence
1    Specify report column formatting
1    Select report summary functions
1    Define report breaks
      Select output type and output form
      Specify processing options

F3=Exit      F5=Report      F12=Previous
F13=Layout   F18=Files      F21=Select all

```

Query presents the selected definition step displays to you in the order they are listed on the Define the Query display.

5. On the Specify File Selections display, which is the first display shown after the Define the Query display, type QRYFILE in the *File* prompt and QGPL in the *Library* prompt. The *Member* and *Format* prompts have been filled in for you already. Press the Enter key.

Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .	QRYFILE	Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	*FIRST	Name, *FIRST, F4 for list

F3=Exit

F4=List

F5=Report

F9=Add file

F12=Previous

F13=Layout

F18=Files

The message Select file(s), or press Enter to confirm. appears.

Specify File Selections

Type choices, press Enter. Press F9 to specify an additional file selection.

File . . . . .	QRYFILE	Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
Member . . . . .	*FIRST	Name, *FIRST, F4 for list
Format . . . . .	QLID0BJD	Name, *FIRST, F4 for list

F3=Exit

F4=List

F5=Report

F9=Add file

F12=Previous

F13=Layout

F18=Files

Select file(s), or press Enter to confirm.

Press the Enter key again.

- The next display to appear is the Select and Sequence Fields display.

Select and Sequence Fields

Type sequence number (0-9999) for the names of up to 500 fields to appear in the report, press Enter.

Seq	Field	Seq	Field	Seq	Field
	ODDCEN		ODCCEN		ODSV02
	ODDDAT		ODCDAT		ODSV03
	ODDTIM		ODCTIM		ODSV04
	ODLBNM		ODOBOW		ODSV05
	ODOBNM		ODSCEN		ODSV06
	ODOBTP		ODSDAT		ODSV07
	ODOBAT		ODSTIM		ODSV08
	ODOBFR		ODSCMD		ODSV09
	ODOBSZ		ODSSZE		ODSV10
	ODOBTX		ODSSLT		ODSVMR
	ODOBLK		ODSDEV		ODRCEN
	ODOBDM		ODSV01		ODRDAT

More...

F3=Exit  
F13=Layout
F5=Report  
F18=Files
F11=Display text  
F20=Renumber
F12=Previous  
F21=Select all

If your display is in multiple-column format (that is, if the *Text*, *Len*, and *Dec* columns are *not* shown), press F11 (Display text) to show some additional information about the fields in the list. Select the fields ODLBNM, ODOBTP, ODOBAT, ODOBSZ, and ODOBTX by typing the numbers 1 through 5 to the left of them as shown below. The fields you select are the fields that will appear in your query report, in the order that you specify (ODLBNM will appear first, followed by ODOBTP, and so on).

Select and Sequence Fields

Type sequence number (0-9999) for the names of up to 500 fields to appear in the report, press Enter.

Seq	Field	Text	Len	Dec
	ODDCEN	DISPLAY CENTURY	1	
	ODDDAT	Display date: Format- MMDDYY	6	x
	ODDTIM	DISPLAY TIME	6	
1	ODLBNM	LIBRARY	10	
	ODOBNM	OBJECT	10	
2	ODOBTP	OBJECT TYPE	8	
3	ODOBAT	OBJECT ATTRIBUTE	10	
	ODOBFR	Storage freed: 0-Not freed,1-Freed	1	
4	ODOBSZ	OBJECT SIZE	10	0
5	ODOBTX	TEXT DESCRIPTION	50	
	ODOBLK	Object locked: 0-Not locked,1-Locked	1	
	ODOBDM	Object damaged: 0-Not damaged,1-Damaged	1	

More...

F3=Exit  
F13=Layout
F5=Report  
F18=Files
F11=Display names only  
F20=Renumber
F12=Previous  
F21=Select all

Press the Enter key. Query rearranges the fields on the display so that the fields you selected are shown at the top of the list in the order that you specified. The message Press Enter to confirm. is also shown.

Select and Sequence Fields

Type sequence number (0-9999) for the names of up to 500 fields to appear in the report, press Enter.

Seq	Field	Text	Len	Dec
1	ODLBNM	LIBRARY	10	
2	ODOBTP	OBJECT TYPE	8	
3	ODOBAT	OBJECT ATTRIBUTE	10	
4	ODOBSZ	OBJECT SIZE	10	0
5	ODOBTX	TEXT DESCRIPTION	50	
	ODDCEN	DISPLAY CENTURY	1	
	ODDDAT	Display date: Format- MMDDYY	6	
	ODDTIM	DISPLAY TIME	6	
	ODOBNM	OBJECT	10	
	ODOBFR	Storage freed: 0-Not freed,1-Freed	1	
	ODOBLK	Object locked: 0-Not locked,1-Locked	1	
	ODOBDM	Object damaged: 0-Not damaged,1-Damaged	1	

More...

F3=Exit
F5=Report
F11=Display names only
F12=Previous

F13=Layout
F18=Files
F20=Renumbr
F21=Select all

Press Enter to confirm.

Press the Enter key again.

7. The next display shown is the Select Records display. Here, you specify which records you want included in your report.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')

Bottom

Field	Text	Len	Dec
ODLBNM	LIBRARY	10	
ODOBTP	OBJECT TYPE	8	
ODOBAT	OBJECT ATTRIBUTE	10	
ODOBSZ	OBJECT SIZE	10	0
ODOBTX	TEXT DESCRIPTION	50	

More...

F3=Exit
F5=Report
F9=Insert
F11=Display names only

F12=Previous
F13=Layout
F18=Files
F20=Reorganize

For your report, you want all records for objects with an object type of either \*FILE or \*PGM. Type the information in the *Field*, *Test*, and *Value* columns as shown in the following display. Do not press the Enter key just yet.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
 Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	ODOBTP	LIST	'*FILE' '*PGM'

Bottom

Field	Text	Len	Dec
ODLBNM	LIBRARY	10	
ODOBTP	OBJECT TYPE	8	
ODOBAT	OBJECT ATTRIBUTE	10	
ODOBSZ	OBJECT SIZE	10	0
ODOBTX	TEXT DESCRIPTION	50	

More...

F3=Exit	F5=Report	F9=Insert	F11=Display names only
F12=Previous	F13=Layout	F18=Files	F20=Reorganize

8. Now display your report by pressing F5 (Report). The Display Report display appears showing your query report, which is based on the query you have defined up to this point. (The information you see on your display depends on the objects that are currently in QGPL on your system. What you see may not match what is shown in the display that follows.)

Display Report

Report width . . . . . : 100  
 Shift to column . . . . .

Position to line . . . . .  
 Line . . . . .10. . . . .20. . . . .30. . . . .40. . . . .50. . . . .60. . . . .70..

LIBRARY	OBJECT TYPE	OBJECT ATTRIBUTE	OBJECT SIZE	TEXT DESCRIPTION
000001 QGPL	*PGM	CLP	14,336	B & R Example - Page 2
000002 QGPL	*PGM	CLP	16,384	B & R Example - page 2
000003 QGPL	*FILE	PF	8,192	
000004 QGPL	*FILE	PF	1,024	Default source data ba
000005 QGPL	*FILE	PF	1,024	Default source data ba
000006 QGPL	*FILE	PF	16,384	Default source data ba
000007 QGPL	*FILE	DKTF	2,560	Default diskette data
000008 QGPL	*FILE	DKTF	2,560	Default source diskett
000009 QGPL	*FILE	PF	1,024	Default source data ba
000010 QGPL	*FILE	PF	140,288	RSTS36FLR COMMAND
000011 QGPL	*FILE	PRTF	2,048	Default spool output p
000012 QGPL	*FILE	PRTF	2,048	Default spool print fi
000013 QGPL	*FILE	PRTF	2,048	Default spool print fi
000014 QGPL	*FILE	PF	38,912	Outfile for DSPOBJD
000015 QGPL	*FILE	PF	16,384	

More...

F3=Exit	F12=Previous	F19=Left	F20=Right	F21=Split
---------	--------------	----------	-----------	-----------

On the bottom far right side of the display, the message More... appears. This means that all of the report does not fit on the display screen, so if you want to see all of the report, you can use the roll keys or F20 (Right) and F19 (Left) to page through the report (both left to right and top to bottom). When you have finished looking at the report, press F3 (Exit) to return to the Select Records display.

Select Records

Type comparisons, press Enter. Specify OR to start each new group.  
 Tests: EQ, NE, LE, GE, LT, GT, RANGE, LIST, and LIKE

AND/OR	Field	Test	Value (Field, Number, or 'Characters')
	ODOBTP	LIST	'*FILE' '*PGM'

Bottom

Field	Text	Len	Dec
ODLBNM	LIBRARY	10	
ODOBTP	OBJECT TYPE	8	
ODOBAT	OBJECT ATTRIBUTE	10	
ODOBSZ	OBJECT SIZE	10	0
ODOBTX	TEXT DESCRIPTION	50	

More...

F3=Exit	F5=Report	F9=Insert	F11=Display names only
F12=Previous	F13=Layout	F18=Files	F20=Reorganize

On the Select Records display, press the Enter key.

9. The next display to appear is the Select Sort Fields display. Here you specify which fields you want Query to use to sort the selected records for your report. You want the records sorted first by object type and then by object size, so type a 1 next to ODOBTP and a 2 next to ODOBSZ as shown below.

Select Sort Fields

Type sort priority (0-999) and A (Ascending) or D (Descending) for the names of up to 32 fields, press Enter.

Sort	Field	Text	Len	Dec
	ODLBNM	LIBRARY	10	
1	ODOBTP	OBJECT TYPE	8	
	ODOBAT	OBJECT ATTRIBUTE	10	
2	ODOBSZ	OBJECT SIZE	10	0
	ODOBTX	TEXT DESCRIPTION	50	

Bottom

F3=Exit	F5=Report	F11=Display names only	F12=Previous
F13=Layout	F18=Files	F20=Renumbr	

Press the Enter key. Query rearranges the fields on the screen so that the fields you selected for sorting appear at the top of the list, in the order you specified. The message Press Enter to confirm. is also displayed.

Select Sort Fields

Type sort priority (0-999) and A (Ascending) or D (Descending) for the names of up to 32 fields, press Enter.

Sort	Prt	A/D	Field	Text	Len	Dec
1	A	ODOBTP	OBJECT TYPE		8	
2	A	ODOBSZ	OBJECT SIZE		10	0
		ODLBNM	LIBRARY		10	
		ODOBAT	OBJECT ATTRIBUTE		10	
		ODOBTX	TEXT DESCRIPTION		50	

Bottom

F3=Exit
F5=Report
F11=Display names only
F12=Previous

F13=Layout
F18=Files
F20=Renumbr

Press Enter to confirm.

Press the Enter key again.

10. The next display is the Specify Report Column Formatting display. It is here that you specify column spacing, column headings, and other report formatting options.

Specify Report Column Formatting

Type information, press Enter.  
(Type \*NONE as the column heading for no field heading in report.)

Field	Column Spacing	Column Headings	Len	Dec	Edit
ODLBNM	0	LIBRARY	10		
ODOBTP	2	OBJECT TYPE	8		
ODOBAT	2	OBJECT ATTRIBUTE	10		

More...

F3=Exit
F5=Report
F12=Previous

F13=Layout
F16=Edit
F18=Files

Query has filled in much of this information for you. Change the column heading for the ODLBNM field so that it reads NAME OF LIBRARY instead of LIBRARY.

Specify Report Column Formatting

Type information, press Enter.  
(Type \*NONE as the column heading for no field heading in report.)

Field	Column Spacing	Column Headings	Len	Dec	Edit
ODLBNM	0	NAME OF LIBRARY	10		
ODOBTP	2	OBJECT TYPE	8		
ODOBAT	2	OBJECT ATTRIBUTE	10		

More...

F3=Exit      F5=Report      F12=Previous  
F13=Layout    F16=Edit      F18=Files

Press the Enter key.

11. The next display you see is the Select Report Summary Functions. By specifying options on this display, you can have selected fields summarized in your report—that is, for a selected field, you can specify that a total, average, minimum, maximum, and/or count be included in your report.

Select Report Summary Functions

Type options, press Enter.  
1=Total    2=Average    3=Minimum    4=Maximum    5=Count

---Options---	Field	Text	Len	Dec
- - - - -	ODLBNM	LIBRARY	10	
- - - - -	ODOBTP	OBJECT TYPE	8	
- - - - -	ODOBAT	OBJECT ATTRIBUTE	10	
- - - - -	ODOBSZ	OBJECT SIZE	10	0
- - - - -	ODOBTX	TEXT DESCRIPTION	50	

Bottom

F3=Exit      F5=Report      F11=Display names only  
F12=Previous    F13=Layout      F18=Files

Specify that you want *all* the summary functions (total, average, minimum, maximum, and count) for the field ODOBSZ by typing 1 through 5 next to the field as shown below.



Select Report Summary Functions

Type options, press Enter.  
 1=Total 2=Average 3=Minimum 4=Maximum 5=Count

---Options---					Field	Text	Len	Dec
					ODLBNM	LIBRARY	10	
					ODOBTP	OBJECT TYPE	8	
					ODOBAT	OBJECT ATTRIBUTE	10	
1	2	3	4	5	ODOBSZ	OBJECT SIZE	10	0
					ODOBTX	TEXT DESCRIPTION	50	

Bottom

F3=Exit  
F12=Previous

F5=Report  
F13=Layout

F11=Display names only  
F18=Files

Press the Enter key.

12. The next display to appear is the Define Report Breaks display. On this display you specify which fields you want used as break fields. Report breaks are used to break the report into groups of records each time the value of the report break field changes.

Define Report Breaks

Type break level (1-6) for up to 9 field names, press Enter.  
 (Use as many fields as needed for each break level.)

Break Level	Sort Prty	Field	Text	Len	Dec
		ODLBNM	LIBRARY	10	
	10	ODOBTP	OBJECT TYPE	8	
		ODOBAT	OBJECT ATTRIBUTE	10	
	20	ODOBSZ	OBJECT SIZE	10	0
		ODOBTX	TEXT DESCRIPTION	50	

Bottom

F3=Exit  
F12=Previous

F5=Report  
F13=Layout

F11=Display names only  
F18=Files

Specify break level 1 for the field named ODOBTP by typing a 1 to the left of it in the *Break Level* column.

Define Report Breaks					
Type break level (1-6) for up to 9 field names, press Enter. (Use as many fields as needed for each break level.)					
Break Level	Sort Prty	Field	Text	Len	Dec
1	10	ODLBNM	LIBRARY	10	
		ODOBTP	OBJECT TYPE	8	
	20	ODOBAT	OBJECT ATTRIBUTE	10	
		ODOBSZ	OBJECT SIZE	10	0
		ODOBTX	TEXT DESCRIPTION	50	
Bottom					
F3=Exit		F5=Report		F11=Display names only	
F12=Previous		F13=Layout		F18=Files	

Press the Enter key.

- On the next display, Format Report Break, you specify the formatting you want for the report break you defined. Note that the value in the *Break level* prompt is zero. You can use break level 0 to print the final summary values for all specified summary functions at the end of the report. For this example, do not change anything on this display. display—just press the Enter key.

Format Report Break	
Break level . . . . .	0
Type choices, press Enter. (Type &field in text to have break values inserted.)	
Suppress summaries . . . .	N Y=Yes, N=No
Break text . . . . .	FINAL TOTALS
Level	Field
1	ODOBTP
F3=Exit F5=Report F12=Previous	
F13=Layout F18=Files	

On the next display you see that the *Break level* prompt has been filled in with a 1. Here you format the report break for break level 1. In the *Break text* prompt, type in Break text for object type. This text will occur in the report every time a report break occurs for this break level.

```

                                Format Report Break

Break level . . . . . : 1

Type choices, press Enter.
(Type &field in text to have break values inserted.)

Skip to new page . . . . . N          Y=Yes, N=No

Suppress summaries . . . . . N        Y=Yes, N=No

Break text . . . . . Break text for object type


Level  Field
 1      000BTP


F3=Exit      F5=Report      F12=Previous
F13=Layout   F18=Files

```

Press the Enter key.

You are finished with all of the definition steps that you selected earlier, so the Define the Query display appears again. (The definition steps you selected earlier are now indicated with a “>” symbol to the left of them.)

```

                                Define the Query

Query . . . . . : QNAME          Option . . . . . : CREATE
Library . . . . : YOURLIB

Type options, press Enter. Press F21 to select all.
1=Select ('>' identifies previously defined options.)

Opt  Query Definition Option
> Specify file selections
  Define result fields
> Select and sequence fields
> Select records
> Select sort fields
  Select collating sequence
> Specify report column formatting
> Select report summary functions
> Define report breaks
  Select output type and output form
  Specify processing options


F3=Exit      F5=Report      F21=Select all
F13=Layout   F18=Files
Select options, or press F3 to save or run the query.

```

14. Now display your report by pressing F5 (Report). The Display Report display appears showing your finished query report. (The information you see on your display depends on the objects that are currently in QGPL on your system. What you see may not match what is shown in the display that follows.)

Display Report					
Position to line . . . . .				Report width . . . . .	104
Line . . . . .10. . . . .20. . . . .30. . . . .40. . . . .50. . . . .60. . . . .70..				Shift to column . . . . .	
NAME OF OBJECT	OBJECT TYPE	OBJECT ATTRIBUTE	OBJECT SIZE	TEXT DESCRIPTION	
000001 QGPL	*FILE	PF	1,024	Default source dat	
000002 QGPL	*FILE	PF	1,024	Default source dat	
000003 QGPL	*FILE	PF	1,024	Default source dat	
000004 QGPL	*FILE	PF	1,024	Default source dat	
000005 QGPL	*FILE	PF	1,024		
000006 QGPL	*FILE	DSPF	1,536		
000007 QGPL	*FILE	PRTF	2,048	Default spool outp	
000008 QGPL	*FILE	PRTF	2,048	Default spool prin	
000009 QGPL	*FILE	PRTF	2,048	Default spool prin	
000010 QGPL	*FILE	TAPF	2,048	Default tape data	
000011 QGPL	*FILE	TAPF	2,048	Default source tap	
000012 QGPL	*FILE	DKTF	2,560	Default diskette d	
000013 QGPL	*FILE	DKTF	2,560	Default source dis	
000014 QGPL	*FILE	PF	8,192		
000015 QGPL	*FILE	PF	8,192		
				More...	
F3=Exit		F12=Previous	F19=Left	F20=Right	F21=Split

On the bottom far right side of the display, the message More... appears. This means that all of the report does not fit on the display screen. Use the roll keys or F20 (Right) and F19 (Left) to page through the report (both left to right and top to bottom) so that you can see the breaks and summaries in the report.

When you have finished looking at the report, press F3 (Exit) to return to the Define the Query display.

Define the Query		
Query . . . . .	QNAME	Option . . . . . : CREATE
Library . . . . .	QGPL	
Type options, press Enter. Press F21 to select all.		
1=Select ('>' identifies previously defined options.)		
Opt	Query Definition Option	
>	Specify file selections	
	Define result fields	
>	Select and sequence fields	
>	Select records	
>	Select sort fields	
	Select collating sequence	
>	Specify report column formatting	
>	Select report summary functions	
>	Define report breaks	
	Select output type and output form	
	Specify processing options	
F3=Exit	F5=Report	
F13=Layout	F18=Files	F21=Select all
Select options, or press F3 to save or run the query.		

Press F3 (Exit).

15. The Exit This Query display is shown. On this display, change the *Save definition* and the *Run this query* prompts to N if you do not want to save the query or run it again.

Exit This Query		
Type choices, press Enter.		
Save definition . . . .	N	Y=Yes, N=No
Run this query . . . .	N	Y=Yes, N=No
For a saved definition:		
Query . . . . .	QNAME	Name
Library . . . . .	QGPL	Name, F4 for list
Text about the query . . . .		
Authority . . . . .	*CHANGE	*CHANGE, *ALL, *EXCLUDE, *USE authorization list name
F4=List            F5=Report            F13=Layout		
F14=Define the query		

Press the Enter key.

16. The Work with Queries display appears, showing the message Query option processing completed successfully.

Work with Queries		
Type choices, press Enter.		
Option . . . . .		1=Create, 2=Change, 3=Copy, 4=Delete 5=Display, 6=Print definition 9=Run
Query . . . . .	QNAME	Name, F4 for list
Library . . . . .	QGPL	Name, *LIBL, F4 for list
F3=Exit            F4=List            F5=Refresh            F12=Previous		
Query option processing completed successfully.		

Now you can return to the AS/400 Main Menu by pressing F3 (Exit) to complete your work with this example.



## Glossary

**all authority.** An object authority that allows the user to perform all operations on the object except those limited to the owner or controlled by authorization list management authority. The user can control the object's existence, specify the security for the object, and change the object. Contrast with *exclude authority*.

**allocate.** To assign a resource for use in performing a specific task. Contrast with *deallocate*.

**alphabetic character.** Any one of the letters A through Z (uppercase and lowercase) or one of the characters #, \$, or @.

**alphanumeric.** Pertaining to the letters, A-Z; numbers, 0-9; and special symbols, \$, #, @, ., or \_ . Synonymous with *alphanumeric*.

**alphanumeric [adj].** Pertaining to the letters A-Z, 0-9; and special symbols \$, #, @, ., or \_ . Synonymous with *alphanumeric*.

**American National Standard Code for Information Interchange (ASCII).** The code developed by American National Standards Institute for information exchange among data processing systems, data communications systems, and associated equipment. The ASCII character set consists of 7-bit control characters and symbolic characters, plus one parity-check bit.

**American National Standards Institute (ANSI).** An organization sponsored by the Computer and Business Equipment Manufacturers Association for establishing voluntary industry standards.

**AND relationship.** The specification of conditioning indicators so that the operation is performed only when all conditions are met.

**ANSI.** See *American National Standards Institute (ANSI)*.

**application.** (1) A particular business task, such as inventory control or accounts receivable. (2) A group of related programs that apply to those tasks.

**application program.** A program used to perform a particular data processing task such as inventory control or payroll.

**arithmetic expression.** A statement containing any combination of values joined together by one or more arithmetic operators in such a way that the statement can be processed as a single numeric value.

**arithmetic operation.** An operation such as addition, subtraction, multiplication, division, or exponentiation that is performed only on numeric fields.

**arithmetic operator.** A symbol used to represent a mathematical operation, such as + or -, used to indicate addition or subtraction.

**ascending sequence.** The arrangement of data in order from the lowest value to the highest value, according to the rules for comparing data. Contrast with *descending sequence*.

**ASCII.** See *American National Standard Code for Information Interchange (ASCII)*.

**authorization list.** A list of two or more user IDs and their authorities for system resources.

**authorization list management authority.** An object authority that allows the user to add users to, and remove users from, the authorization list and change users' authorities on the authorization list.

**authorize.** Permit or give authority to.

**basic double-byte character set.** A character set defined by IBM that contains 3226 Kanji and 481 additional characters. The additional characters include Katakana, Hiragana, the alphabet (A through Z and a through z), numbers (0 through 9), Roman numerals (I through X), Greek, Cyrillic, and special symbols. Contrast with *extended double-byte character set*; see also *double-byte character set*.

**bit.** Either of the binary digits, 0 or 1. Compare with *byte*.

**bit constant.** Either a series of binary numbers enclosed in apostrophes and followed immediately by B or B1, or a series of hexadecimal numbers enclosed in apostrophes and followed immediately by B4. Contrast with *character constant*.

**byte.** A group of eight adjacent binary digits representing one character; a byte is eight bits.

**change authority.** An object authority that allows a user to perform all operations on the object except those limited to the owner or controlled by object existence authority and object management authority. The user can add, change, and delete entries in an object, or read the contents of an entry in the object. Change authority combines object operational authority and all the data authorities.

**character.** Any letter, number, or other symbol in the data character set that is part of the organization, control, or representation of data.

**character constant.** The actual character value (a symbol, quantity, or constant) in a source program that is itself data, instead of reference to a field that contains the data.

**character field.** An area that is reserved for information that can contain any of the characters in the data character set. Contrast with *numeric field*.

**character key.** A keyboard key that allows the user to type into the system the character shown on the key. See also *command key* and *function key*.

**character operator.** A symbol representing an operation to be performed on character data, such as concatenation (joining the data or fields) in CL or BASIC.

**CL.** See *control language (CL)*.

**COBOL (common business-oriented language).** A high-level programming language, based on English, that is used primarily for commercial data processing.

**collating sequence.** The order in which characters are arranged within the computer for sorting, combining, or comparing.

**column list merge.** A data/text merge option that combines data from a query or file into a document in a column list format.

**command.** A statement used to request a function of the system. A command consists of the command name, which identifies the requested function, and parameters.

**command attention key.** A keyboard key used with the command (CMD) key to request preassigned functions. Input data is not returned to the system. Contrast with *command function key*.

**command file.** A remote job input stream that can contain host system commands and job control language (JCL), data, and RJEF control statements (READFILE or EOF). Contrast with *data file*.

**command function key.** A keyboard key that is used with the command (CMD) key to request preassigned functions. Data is returned to the system. Contrast with *command attention key*.

**command line.** The blank line on a display where commands, option numbers, or selections can be entered.

**concatenate.** (1) To link together. (2) To join two character strings.

**confirm.** In the calendar function, to change the status of a tentative appointment. A confirmed appointment

can only be changed by the owner or a user authorized to the calendar.

**control language (CL).** The set of all commands with which a user requests system functions.

**currency symbol.** A character such as the dollar sign (\$) used to identify monetary values.

**current library.** The first library in the user portion of the library list. The name for the current library may be specified on the sign-on display or in a user profile. If you specify an object name (such as the name of a file or program) on a command, but do not specify a library name, the system searches the libraries in the system portion of the library list, then searches the current library. The current library is also the library the system uses when you create a new object, if you do not specify a library name.

**cursor.** A moveable symbol, often a blinking or solid block of light, that tells the user where to type, or identifies a choice to select.

**data area.** A storage area used to communicate data such as CL variable values between the programs within a job and between jobs. The system-recognized identifier for the data area is \*DTAARA.

**data base.** The collection of all data files stored in the system.

**data base file.** An object that contains descriptions of how input data is to be presented to a program from internal storage and how output data is to be presented to internal storage from a program. See also *physical file* and *logical file*.

**data definition.** Information that describes the contents and characteristics of a field, record format, or file. A data definition can include such things as field names, lengths, and data types. See also *field definition*, *file definition*, and *record format definition*.

**data description specifications.** A description of the user's data base or device files that is entered into the system in a fixed form. The description is then used to create files. Abbreviated DDS.

**data dictionary.** An optional part of a library for storing field, record format, and file definitions.

**data file.** A collection of related data records organized in a specific order.

**data file utility (DFU).** The part of the Programming Development Aids licensed program that is used to enter, maintain, and display records in a data base file.

**data item.** A unit of information to be processed.

**data merge.** See *data/text merge*.



**data type.** A characteristic used for defining data as numeric or character.

**data/text merge.** The process of combining data from a file or another document (such as names and addresses) with the text of a document (such as a form letter).

**DBCS.** See *double-byte character set*.

**DDS.** See *data description specifications*.

**deallocate.** To release a resource that is assigned to a specific task. Contrast with *allocate*.

**decimal position.** (1) The location of the decimal point in a series of numbers. (2) Numbers to the right of the decimal point. For example, 4.009 has three decimal positions.

**default.** Value automatically supplied or assumed by the system or program.

**default query.** A query that is run using only a file name and possibly some record selection specifications; an undefined query.

**default value.** A value supplied by the system that is used when no value is specified by the user. Same as assumed value.

**dependent column list merge.** A combination of multi-copy merge and column list merge.

**dependent query.** A query with a dependent value that is used during record selection to refer to either a file or another query. It is used to coordinate the name; for example, in a form letter, with the list of records that belong to that name.

**dependent value.** A reference in a query to another query or to a file. A query with a dependent value is used only in a data field text instruction with column list specified in a OFFICE document.

**descending sequence.** The arrangement of data in order from the highest value to the lowest value, according to the rules for comparing data. Contrast with *ascending sequence*.

**detail report.** A report that contains all the information produced by a query. Contrast with *summary report*.

**DFU.** See *data file utility (DFU)*.

**digit.** Any of the numerals from 0 through 9.

**direct file.** A data base file in which records are assigned specific record positions by the relative record number. Contrast with *indexed file* and *sequential file*.

**direct merge.** A data/text merge option that creates a query report and places it at the bottom of a word processing document that is being edited.

**disk.** (1) A storage media made of one or more flat, circular plates with magnetic surfaces on which information can be stored. (2) A direct-access storage medium with magnetically recorded data.

**display screen.** The part of the display device, which is similar to a TV picture tube, used to display information entered or received at a work station.

**display station.** A device that includes a keyboard from which an operator can send information to the system and a display screen on which an operator can see the information sent to or the information received from the system.

**DisplayWrite 4.** A text processing program for the personal computer with the functions of DisplayWrite/3, plus footnotes, merge capabilities, and some advanced editing functions.

**double-byte character set (DBCS).** A character set that represents each character by 2 bytes. See *basic double-byte character set* and *extended double-byte character set*.

**double-byte character set system.** A system capable of processing and displaying both single-byte and double-byte characters.

**double precision.** The specification that causes a floating-point value to be stored (internally) in the long format (two computer words). See also *precision*; contrast with *single precision*.

**DW4.** See *DisplayWrite 4*.

**EBCDIC.** See *extended binary-coded decimal interchange code (EBCDIC)*.

**EBCDIC character.** Any one of the symbols included in the 8-bit EBCDIC set.

**edit.** (1) To change the form or format of data; for example, to insert or remove characters for dates or decimal points. (2) To make changes to a document by adding, changing, or removing text.

**edit code.** A letter or number indicating that editing should be done according to a defined pattern before a field is displayed or printed. Contrast with *edit word*.

**edit word.** A user-defined word with a specific format that indicates how editing should be done. Contrast with *edit code*.

**exclude authority.** An object authority that prevents the user from using the object or its contents. Contrast with *all authority*.

**expression.** A representation of a value with variables and constants appearing alone or in combination with operators.

**extended binary-coded decimal interchange code (EBCDIC).** A set of 256 eight-bit characters.

**extended double-byte character set.** An character set, residing in auxiliary storage, that contains 3483 IBM-supplied double-byte characters and up to 4370 user-defined double-byte characters. Contrast with *basic double-byte character set*; see also *double-byte character set*.

**field.** A group of related characters (such as name or amount) that are treated as a unit on a record.

**field definition.** Information that describes the characteristics of data in a field. A field definition is contained in a data dictionary.

**file.** A generic term for the object type that refers to a data base file, a device file, or a set of related records treated as a unit. The system-recognized identifier for the object type is \*FILE.

**file definition.** Information that describes the contents and characteristics of a file. A file definition resides in a data dictionary.

**file description.** The data description specifications that describes the file and its contents.

**file identifier.** A 3-character identifier used for files being joined in Query for a query. The identifiers are used during query definition to uniquely identify each file.

**file name.** The name used by a program to identify a file.

**file overrides.** Attributes specified at run time that change the attributes specified in the file description or in the program.

**fixed length.** A specified length for a record or field that cannot be changed.

**floating-point.** a mathematical notation in which a quantity of a number is shown as number multiplied by a power of the number of the base.

**folder.** A directory for documents. A folder is used to group related documents and to find documents by name. The system-recognized identifier for the object type is \*FLR.

**format.** See *record format*.

**function key.** A keyboard key that allows the user to select keyboard functions or programmer functions. Contrast with *character key*.

**general-purpose library.** The library shipped with the system that contains IBM-provided objects required for many system functions and user-created objects that are not explicitly placed in a different library when they are created. Named QGPL.

**generic.** Relating to, or characteristic of, a whole group or class.

**generic name.** The characters common to object names that can be used to identify a group of objects. A generic name ends with an \* (asterisk). For example, ORD\* identifies all objects whose names begin with the characters ORD.

**hexadecimal constant.** A series of hexadecimal numbers enclosed in apostrophes that keep the value of the string. See also *bit constant* and *character constant*.

**highlight.** To define text to be shown in contrast with other text by underlining, italics, bold-face; or on a display, high-intensity (brightness of characters), blinking, or reverse image. You can highlight words, parts of words, or information typed into a form using the text definition function of OFFICE.

**IDDU.** See *interactive data definition utility (IDDU)*.

**indexed file.** A file that records the key and the position of each record in a separate part of the file, called the index. Contrast with *direct file* and *sequential file*.

**input field.** A field is a display file or data base file that is used for data you supply.

**interactive data definition utility (IDDU).** The part of the system used to externally define the characteristics of data and the contents of files.

**join.** An operation that combines data from two or more logical files or SQL tables from specified values.

**join field.** A comparison field that identifies records from two physical files to be combined into one record in a logical file.

**join file.** A file with records made up of the fields from one or more logical files.

**join logical file.** A logical file that combines (in one record format) fields from two or more files. In the record format, not all the fields need to exist in all the physical files.

**keyword functions.** The result of processing DDS keywords in a record format specified on an operation. See also *operation*.

**library.** (1) An object on disk that serves as a directory to other objects. A library groups related objects, and allows the user to find objects by name. Compare with *folder*. (2) The set of publications for a system.

**library list.** A list that indicates which libraries are to be searched and the order in which they are to be searched. The system-recognized identifier is \*LIBL.

**licensed program.** An IBM-written program that performs functions related to processing user data.

**link.** To connect a data file on disk with a file definition in a data dictionary. Contrast with *unlink*.

**logical expression.** An expression consisting of logical operators and/or relational operators that can be evaluated to a value of either true or false.

**logical file.** A description of how data is to be presented to or received from a program. This type of data base file contains no data, but it defines formats for one or more physical files. See also *join logical file*. Contrast with *physical file*.

**logical file member.** A named logical grouping of data records from one or more physical file members. See also *member*.

**logical operator.** A word or symbol that defines the logical connection between conditions or that makes opposite a condition.

**long comment.** Up to a full-screen description of a field, record format, or file. Long comments are typed when the field, record format, or file is created or changed, and displayed either from IDDU or Query.

**master file.** A collection of permanent information, such as a file of customer addresses.

**megabyte.** A unit of measure for storage capacity; 1 megabyte = 1 048 576 bytes.

**member.** Different sets of data, within one file.

**merge.** (1) To insert records throughout a single output file. (2) To combine overrides for a file from the first call level up to and including a greater call level, producing the override to be applied when the file is used.

**multicopy merge.** See *multiple letters merge*.

**multiple letters merge.** A data/text merge option that produces one document for each record in the data file.

**numeric character.** Any one of the digits 0 through 9.

**numeric constant.** The actual numeric value to be used in processing, instead of the name of a field containing the data. A numeric literal can contain any of the numeric digits 0 through 9, a sign (plus or minus), and a decimal point. Contrast with *character constant*. See also *bit constant* and *hexadecimal constant*.

**numeric expression.** A numeric constant, a simple numeric variable, a scalar reference to a numeric array, a numeric-valued function reference, or a sequence of the above, separated by numeric operators and parentheses.

**numeric field.** An area that is reserved for a particular unit of information and that can contain only the digits 0 through 9. Contrast with *character field*.

**numeric operator.** A symbol representing an operation to be performed on numeric data, such as + or – to indicate addition or subtraction.

**object.** A named unit that consists of a set of characteristics (that describe the object) and, in some cases, data. An object is anything that exists in and occupies space in storage and on which operations can be performed. Some examples of objects are programs, files, and libraries, and folders.

**object authority.** The authority that controls what a system user can do to an entire object. For example, object authority includes deleting, moving, or renaming an object. There are seven types of object authorities: object existence, object management, object operational, add, use, change, and exclude.

**object existence authority.** An object authority that allows the user to delete the object, free storage of the object, save and restore the object, transfer ownership of the object, and create an object that was named by an authority holder.

**object management authority.** An object authority that allows the user to specify the authority for the object, move or rename the object, and add members to data base files.

**object name.** The name of an object. Contrast with *qualified name*.

**object owner.** A user who creates an object or to whom the ownership of an object was reassigned. The object owner has complete control over the object.

**offline.** Pertaining to the operation of a functional unit that is not under the continual control of the system. Contrast with *online*.

**online.** Pertaining to the operation of a functional unit that is under the continual control of the system. Contrast with *offline*.

**online information.** Information, read on the display screen, that explains displays, messages, and programs.

**operating system.** A collection of system programs that control the overall operation of a computer system.

**operation.** The result of processing statements in a high-level language. See also *keyword functions*.

**OR relationship.** The specification of conditioning indicators such that the conditioned operation is done when any one of the conditions is met.

**override.** A value that replaces a previous value.

**owner.** The user who creates an object (or is named the owner of an object).

**packed decimal format.** Representation of a decimal value in which each byte within a field represents two numeric digits except the rightmost byte, which contains one digit in bits 0 through 3 and the sign in bits 4 through 7. For all other bytes, bits 0 through 3 represent one digit; bits 4 through 7 represent one digit. For example, the decimal value +123 is represented as 0001 0010 0011 1111. Contrast with *zoned decimal format*.

**parameter.** A value supplied to a command or program that either is used as input or controls the actions of the command or program.

**AS/400 PC Support.** An AS/400 system licensed program that provides AS/400 functions to an attached personal computer.

**physical file.** A description of how data is to be presented to or received from a program and how data is actually stored in the data base. A physical file contains one record format and one or more members. Contrast with *logical file*.

**physical file member.** A named subset of the data records in a physical file. See also *member*.

**precision.** Exactness, especially in stating measurements or performing operations. The degree of accuracy of a number. See also *double precision* and *single precision*.

**primary file.** (1) In a join logical file, the first physical file specified on the *JFILE* keyword. Contrast with *secondary file*. (2) For certain types of join operations, the first of all files that are joined in a query definition. The data from this file is used in every record formed by a join specification.

**printer ID.** The identification code assigned to printers.

**processing.** The action of performing operations and calculations on data.

**profile.** Data that describes the characteristics of a user, program, device, or remote location.

**prompt.** (1) A reminder or a displayed request for information or user action. The user must respond to allow the program to proceed. (2) A list of values or a request for information provided by the system as a reminder of the type of information or action required.

**QGPL.** See *general-purpose library*.

**qualified name.** The name of the library containing the object and the name of the object. Contrast with *object name*.

**query.** A request to select and copy from a file one or more records based on defined conditions. For example, a request for a list of all customers in a customer master file, whose balance is greater than \$1,000.

**query application.** See *application*.

**query definition.** Information about a query that is stored in the system.

**Query.** A licensed program used to select, format and analyze information from data files to produce reports and other files.

**record.** A collection of related data or words, treated as a unit; such as one name, address, and telephone number.

**record format.** The arrangement of data in the records contained in, or processed by, a file. The record format includes the record name, field names, and field descriptions (such as length and data type). The record formats used in a file are contained in the file description.

**record selection.** The process of selecting particular records from a file and including the information from the records, for example, in a report.

**relational expression.** A logical statement that describes the relationship (such as greater than or equal to) of two arithmetic expressions or data items.

**relational operator.** The reserved words or symbols used to express a relational condition or a relational expression.

**restore.** To copy data from tape, diskette, or a save file to auxiliary storage. Contrast with *save*.

**result field.** A field that contains the results of calculations performed on numeric fields in a file.

**reverse image.** Text that appears on the display in the opposite color (for example, black on green instead of green on black).

**RPG.** Report Program Generator. A programming language designed for writing application programs for common business data processing requirements.

**save.** To copy specific objects or libraries by transferring them from main or auxiliary storage to magnetic media such as tape or diskettes or to a save file. Contrast with *restore*.

**secondary file.** (1) For certain types of join operations, all files except the first file that are joined in a query

definition for the purpose of getting data. (2) In a join logical file, any physical file, other than the first physical file, that is specified on the JFILE keyword. Contrast with *primary file*.

**sequence.** To arrange in order.

**sequential file.** A file in which records are arranged in the order in which they were entered or received. Contrast with *direct file* and *indexed file*.

**session.** (1) The length of time that starts when a user signs on and ends when the user signs off at a display station. (2) In communications, the logical connection by which a program or device can communicate with a program or device at a remote location.

**shared file.** A file whose access path can be shared between two or more programs processing in the same step.

**shared-for-read lock state.** The assigned state for a file in which the file can be shared with another program if the program does not request exclusive use of the file. The predefined value for this lock state is \*SHRRD.

**shared-for-update lock state.** The assigned state for a file in which the file can be shared either for update or for read operations with program. The predefined value for this lock state is \*SHRUPD.

**shared-no-update lock state.** The assigned state for a file in which the file can be shared with another program if the program requests either a shared-no-update lock state or a shared-for-read lock state. The predefined value for this lock state is \*SHRNUP.

**shift control character.** See *shift-in character* and *shift-out character*.

**shift-in character.** A control character (hex 0F) that indicates the end of a string of double-byte characters. Contrast with *shift-out character*.

**shift-out character.** A control character (hex 0E) that indicates the start of a string of double-byte characters. Contrast with *shift-in character*.

**single precision.** The specification that causes the floating-point value to be stored (internally) in the short format. See also *precision*; contrast with *double precision*.

**special character.** A character other than a digit, a letter, or \$, #, @, ., or \_. For example, \*, +, and % are special characters.

**SQL/400.** See *Structured Query Language/400 (SQL/400)*.

**Structured Query Language/400 (SQL/400).** A programming language, supporting the relational data base.

Used to supply information into a data base and to get and organize selected information from a data base.

**summary function.** A function of Query used to total, average, minimize, maximize, or count the fields that appear on a query report.

**summary report.** A report that contains only summary information; such as the total, average, minimum, maximum, or count; by a query. Contrast with *detail report*.

**system value.** Control information for the operation of certain parts of the system. A user can change the system value to define his working environment. System date and library list are examples of system values.

**System/36 environment.** A function of the operating system that processes most of the System/36 operator control language (OCL) statements and procedure statements to run System/36 application programs and allows the user to process the control language (CL) commands. Contrast with *System/38 environment*.

**System/38 environment.** A function of the operating system that processes most of the System/38 control language (CL) statements and programs to run System/38 application programs. Contrast with *System/36 environment*.

**test condition.** A statement that, when taken as a whole, may be either true or false, depending on the circumstances existing at the time the expression is evaluated.

**test value.** A value used to compare for a specified condition.

**thousands separator.** The character (comma in the United States) placed every third number starting left of the decimal point. For example, four thousand separators are used in the number: 641,322,974,821.

**translation table.** (1) A system table that provides replacement characters for characters that cannot be printed. (2) An object that contains a set of hexadecimal characters used to translate one or more characters of data. For example, unprintable characters can be translated to blanks, and lowercase alphabetic characters can be translated to uppercase characters. The system-recognized identifier for the object type is \*TBL.

**unlink.** To remove the association between a data file on disk and a file definition in a data dictionary. Contrast with *link*.

**use authority.** An object authority that allows the user to run a program or display the contents of a file. Use authority combines object operational authority and read authority.

**user-defined collating sequence.** A collating sequence defined by the user that replaces the EBCDIC collating sequence provided by the system for sorting fields in a query report.

**value.** Smallest unit of data used.

**work station.** A device used to transmit information to or receive information from a computer; for example, a display station or printer.

**zoned decimal format.** A format for representing numbers in which the digit is contained in bits 4 through 7 and the sign is contained in bits 0 through 3 of the rightmost byte; bits 0 through 3 of all other bytes contain 1s (hex F). For example, in zoned decimal format, the decimal value of +123 is represented as 1111 0001 1111 0010 1111 0011. Same as unpacked decimal format. Contrast with *packed decimal format*.

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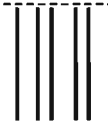
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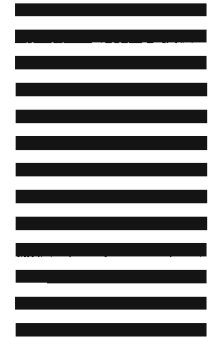
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