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# LeeTech DBA/Query

Windows Version



***LeeTech Software Inc.***

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# LeeTech DBA/Query

## Windows Version Reference Manual



**LeeTech**  
SOFTWARE INC.

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# 1. Introduction

DBA/Query is a set of tools for manipulating data and for quickly finding and displaying the information needed from ALLBASE/SQL and IMAGE/SQL databases. Although DBA/Query uses Structured Query Language (SQL), no expert knowledge of it is necessary.

DBA/Query has two active software programs. The client runs on a standard personal computer (PC). The server operates on the HP system containing the databases. In an operational system, one client can communicate with one or multiple servers. The client communicates with the server using DBA/Query's built in communications. DBA/Query can connect to database machines over a local area network (LAN) or a wide area network (WAN). It includes its own communications facilities that can co-exist and are compatible with most LAN operating systems. No external add-on communications or terminal emulators are required.

The client PC operates under Microsoft Windows. Like most Windows applications, DBA/Query is easily used with a mouse. It provides the customary screen objects—menu, toolbar, push buttons, list boxes, scrolling regions—that make the user interface simple. All operations are prompted on the screen. Complete online help is always available at the touch of a key or a click of a mouse.

The operations supported by DBA/Query are:

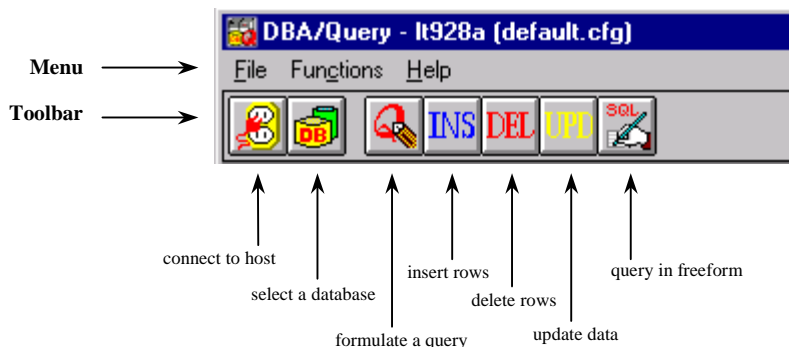
- **Query**        Retrieve data from multiple tables and view in the desired order and grouping.
- **Insert**        Add rows of data to any table in the database.
- **Delete**        Delete selected rows from any table.
- **Update**        Modify data in selected rows from any table.

The Quick Start section of this manual briefly summarizes the steps taken to accomplish each of the listed operations. Subsequent sections describe each of the operations in detail and provide installation instructions for both the server and the client modules of DBA/Query.

## 2. Quick Start

This section briefly outlines the steps required to perform each of the five DBA/Query operations: formulating a query, directly writing a free form query, inserting new rows into a table, deleting rows and updating data.


Start DBA/Query by double clicking on its icon in the Windows Program Manager. The main window appears. This window offers both a menu and a toolbar. The menu includes the toolbar functions and other commands. The menu and toolbar may change depending on the operation selected.



**Figure 2-1. DBA/Query Main Window**

To quit DBA/Query at any point, choose **Exit** from the **File** menu. If more information is wanted about a particular dialog or option, press the F1 key or select **Help** from the menu. This brings the online help system directly to information pertinent to the current action.

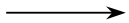
## Preparation

Click  (or select **Connect** from the **File** menu) to activate the Server Connection window.

Before performing any database operations, connection must first be made to the host server. In the window, identify the host by name or IP address. Log on with a User and Account that has authority to access the desired databases. If Group is left blank, the default group is assumed.

Should the connection operation fail, check the network setup.

## Installation

Click  (or select **Database** from the **File** menu) to activate the Open Database window.

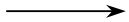


Next, open the databases that are going to be worked with and select one, making it *active*.

Enter the database name in the window and click on **[Open DB]**. As the databases are opened,

they are added to the opened list below. Make one active by double clicking on it or by highlighting it and clicking on the **[Select]** button.

## Formulating a Query

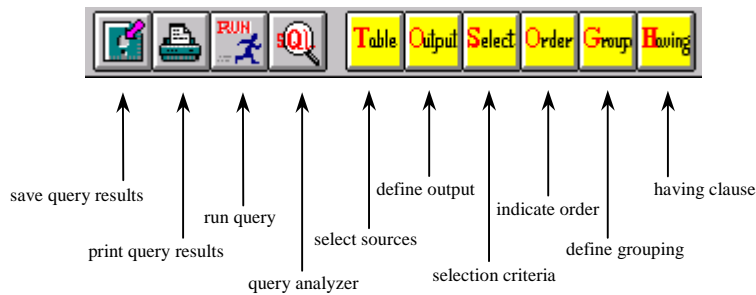
Click  (or select **Query** from the **Functions** menu) to activate the Query window, which displays the particulars of the SQL statement.




When **Query** is selected, a number of functions are added to the menu and toolbar.

The **[Run]** button allows execution of the query. The buttons to the right, starting with **[Table]** and ending with **[Having]** opens windows

related to the particular function.



**Figure 2-2. Query Toolbar**



Click  (or select **Table** from the **Query** menu) to activate the table selection window.



This window allows identification of source tables/views. Indicate the type of source to access by checking Table and/or View. Display a list of possible source tables and/or views by clicking on the **[List]** button. If the scope is not narrowed by entering an owner or table/view name, all tables/views in the database appear in the list.



Select the sources to be included, one at a time. With each additional table added, a prompt asking for a join condition will appear. Select the table that has a matching column and then select the respective column names

from the drop down lists. Click on **[OK]** when done and the selected tables will be listed in the Query window.

Click   This window lists all of the columns in the tables and views that have been selected. Highlight each column that is to be included and click on **[Select]**. The asterisk (\*) can be selected to include all columns in the table.



(or select **Output** from the **Query** menu) to activate the output selection window.

In the selected column list, highlighting a column to move and clicking on the up or down arrow buttons can reorder the columns. After clicking on **[OK]**, the selected columns appear in the Query window.

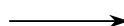

Click   Use the Select tool to specify criteria that rows must possess in order to be included in the query. For convenience, the window gives a drop down list of columns and a drop down list of relational and logical operators. The editing region is in free format, which means the

(or choose **Select Condition** from the **Query** menu) to activate the Select Condition window.



program does not check syntax. Constructing a proper query clause is dependent on personal choice. Parentheses must be provided to resolve ambiguity.

Click   The Order tool sorts out data for the query. It selects sort column(s) from the list of columns included in the query. Order the selected column(s) with the primary sort column at the top. After clicking on **[OK]**, the sort columns appear in the Query window.

(or select **Order By** from the **Query** menu) to activate the window.

Click   The Group tool selects the column(s) by which to group the query results. Order the selected columns with the major grouping at the top. Click on **[OK]** to return to the Query window.

(or select **Group By** from the **Query** menu) to activate the window.


Click   The Having tool provides selection criteria for the specified data groups. This window looks and acts like the Select By window. Construct the clause in a logical way and click on **[OK]** when done.

(or select **Having** from the **Query** menu) to activate this optional window.

## Installation

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The Query window now shows all the components of the parameters set forth. The query can be saved so that it can be run anytime and it can be executed immediately.

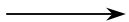
Click  (or select **Run** from the **Query** menu) to execute the query.



When the query successfully concludes, a window displays the number of rows that qualified and prompts for entering of the number of rows to be downloaded to the PC.


If there are any problems with the query statement, the error message will be passed through to an alert window. The error can be corrected and the query can be rerun.

The resulting rows are displayed in spreadsheet format of 60 row increments. The ramifications of the paging feature on printing or copying query results are discussed in the Query chapter.

Click  (or select **Vertical** from the **Insert** menu) to switch display mode.

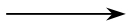


It might be easier to view data in vertical mode. To view the previous or next row, click on **[Prev]** or on **[Next]**. Click on **[OK]** when done to return to the Query Data window.

Click  (or click **Description** from the **Query** menu) to save.




Query results can be saved as a tab-delimited ASCII file to be imported into other applications, such as a spreadsheet or word processor. The query can be saved as a file to be executed again at another time. Select **Save As** from the **File** menu and give the query file a name. The file extension defaults to .QRY.

Click  (or select **Print** from the **File** menu) to print.

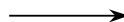


Query results can be printed at any time. Select any or all of the query output. Constructed .SQL or .QRY files can also be printed. The output appears in free form query, with query statements appearing in the left column.

Click  (or select **Query Analyzer** from the **Query** menu) to analyze a SQL statement.




As an advanced database user who has a working knowledge of access plans, this feature allows optimization of data selection. Indexes and constraints can be analyzed. Table information can also be viewed.

Click  (or select **Query in Freeform** from the **Functions** menu) to construct queries.




The query builder does not have to be used to construct queries. Queries can be constructed directly by typing SQL statements and their predicates.

## Inserting New Rows

Click  (or select **Insert** from the **Functions** menu) to activate the insert data operations.



The Table Select window appears first when the Insert operation is selected.


Click  (or select **Vertical** from the **Insert** menu) to switch display mode.



1. Select the target table by double clicking on a table in the list of tables in the database.
2. The Insert Data window shows all columns in the table in spreadsheet format. Data values can be entered into the spreadsheet or when in vertical mode. In vertical mode, column attributes are shown with each data entry field. Only one row at a time can be entered in vertical mode.
3. Click on **[Insert]** to execute the operation.

Column validation is performed when the Insert statement is executed. An error aborts the insert operation beyond the error point. That is, all rows up to the row in error are successfully inserted; none beyond the error point are inserted. The error will need to be corrected and the Insert statement must be run again.

## Deleting Rows

Click  (or select **Delete** from the **Functions** menu) to activate the row deletion operations.



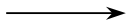
The Table Select window appears first when the Delete operation is selected.

1. Select the target table by double clicking on a table in the list of tables in the database.
2. In the Delete Data window, retrieve the rows to be deleted. To enter selection

criteria, double click on a column name to copy the name into the selection criteria editing region. Then, enter a valid relational operator and the data value. The selection expression can be as complex as desired, but it must be logical. Click on **[Search]** to display the selected rows in the spreadsheet.

3. Place a check mark beside each row to be deleted. Toggle the check mark by clicking on the button to the left of the spreadsheet row.
4. When the rows to be deleted have all been checked, click on **[Delete]** to execute the operation.

## Updating Data

Click  (or select **Update** from the **Functions** menu) to activate the update data operations.



The Table Select window appears first when the Update operation is selected.

1. Select the target table by double clicking on a table in the list of tables in the database.
2. In the Update Data window, retrieve the rows to update. To enter selection criteria, double click on a column name to copy the name into the selection criteria editing region. Then, enter a relational operator and the data value. The selection expression can be as complex as desired, but it must be logical. Click on **[Search]** to display the selected rows in the spreadsheet.
3. The retrieved rows are presented in spreadsheet format. Data values can be entered into the spreadsheet or switched to vertical mode. In vertical mode, column attributes are shown with each data edit field. Only one row at a time can be edited in vertical mode.
4. Place a check mark beside each row to be

updated. Toggle the check mark by clicking on the button to the left of the spreadsheet row.

5. When the rows to be updated have all been checked, click on **[Update]** to execute the operation.

## **Security Configuration**

The network administrator grants certain privileges, such as being able to insert, delete, or update data. Select **File** and then **Preferences** from the menu to determine privileges. Scroll through the preferences in the left column.


Personal configurations can also be set. For example, when starting DBA/Query for Windows, it can automatically log on to the server and open a database.

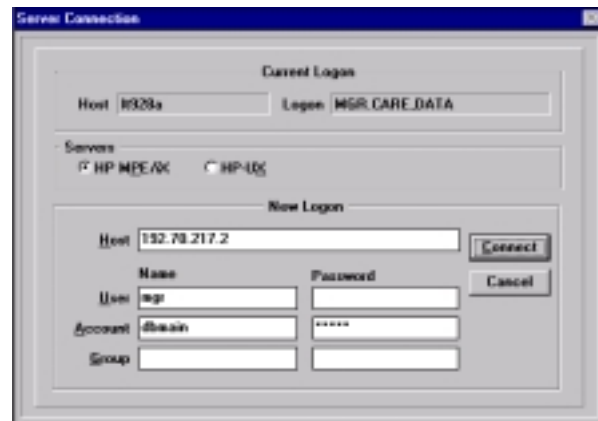


### 3. Preparation

Before performing any of the DBA/Query functions, connection must first be made to the server machine where the target database resides. Then the database must be opened. The server module must be running on the server. See the Installation section for guidance in starting the server module.

#### Connecting to the Host

Click  (or select **Connect** from the **File** menu) to activate the Server Connection window. In the “Server Connection window,” in the **Host** field, either enter the name of the host server (e.g. LT) or the IP address in dot notation (e.g.192.70.217.2).




**Figure 3-1. Switching Logon with the Server Connect Window**

Enter the logon information to access the desired databases. The User and Account fields are required. If the Group field is omitted, the default group is assumed. Enter whatever passwords are necessary. As a password is typed in, an asterisk is displayed instead of the character typed.

Click on [**Connect**] or press the Enter key to initiate the network connection. An error message appears if the connection attempt fails. The error message will tell whether the problem is related to the logon or a network problem. If there is a network problem, check the network configuration on the PC or consult a network manager.

Upon successful connection, the Server Connect window disappears and the mouse pointer changes from the hourglass to an arrow.

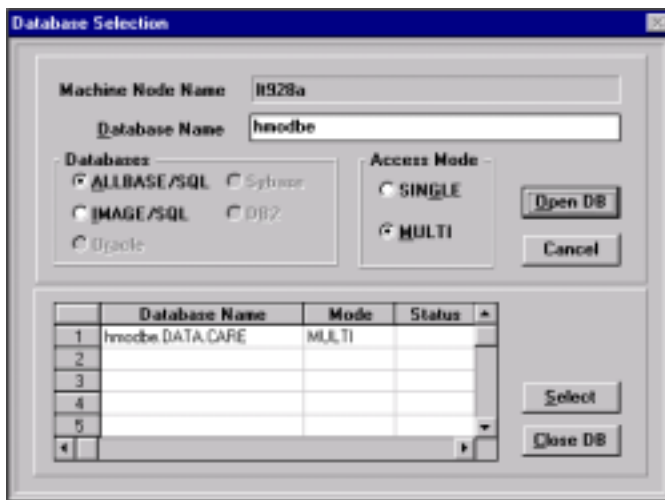
## Opening the Database

Click  (or select **Database** from the **File** menu) to activate the **Open Database** window.



The next step is to open the databases with which to work with and select one, making it the active database.

The Database Selection window appears with the server name referenced. Enter a database name in the Database Name field and indicate the access mode. To have exclusive use of the database, click on **[Single]**. Click on **[Open]** to open the database and see it listed in the list below.



**Figure 3-2. The Database Selection Window Displaying No Active Database**

Up to 10 databases can be opened in this manner. From the list of databases, select one to make active. Either double click on a listed database or highlight the database name and click on **[Select]**. The word “active” appears in the selected database Status column. This window disappears and proceeds with selecting a function from the toolbar or **Function** menu. Otherwise, click on **[Close]** when done.

## 4. Query



The Query operation provides the tools needed to formulate a query statement. A query statement allows retrieval of specific data elements in a desired arrangement. This operation leads through the specification of the various query statement components:



data sources



output columns



selection criteria



row sorting order



data grouping



group selection criteria

Select this operation by clicking on the *Query* toolbar icon or by selecting **Query** from the **Function** menu. An alert window comes up if no connection has been made to the host server and no database has been selected.

The menu changes to include the **Query** and **Window** options while the toolbar adds more icons. The Query window is originally empty, however, the various areas fill in as each statement component is constructed. A new query can be created or a previously saved query can be opened.

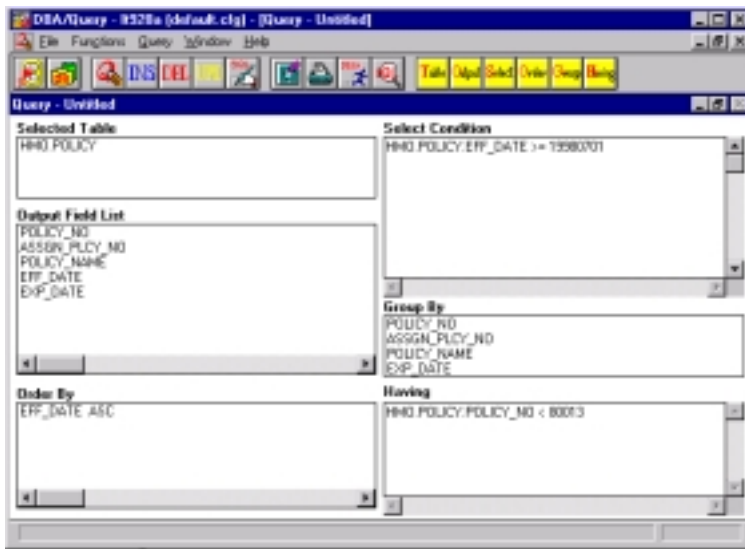


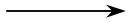

Figure 4-1. The Query Window After Constructing a New Query

Because several windows can be opened concurrently while constructing a query, the **Window** menu is useful for switching among them.

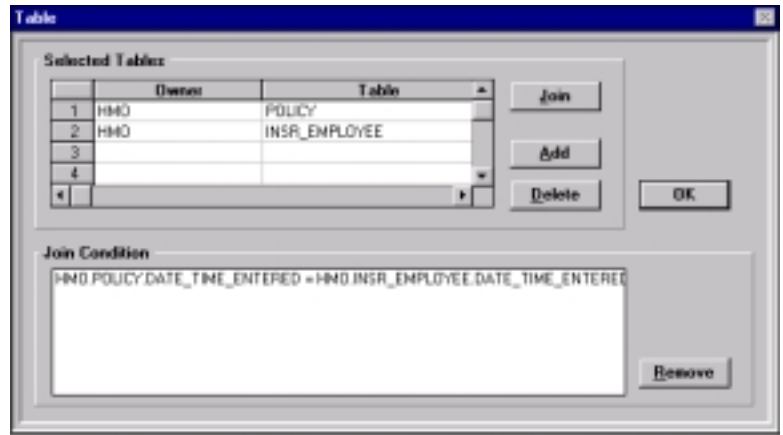
## Creating a New Query

Once connection with a source has been made, a query can be created. The operation is performed by clicking on the *Query* icon. This causes other icons to be added to the toolbar. Select the icons to build a desired query.

### Identifying Source Tables

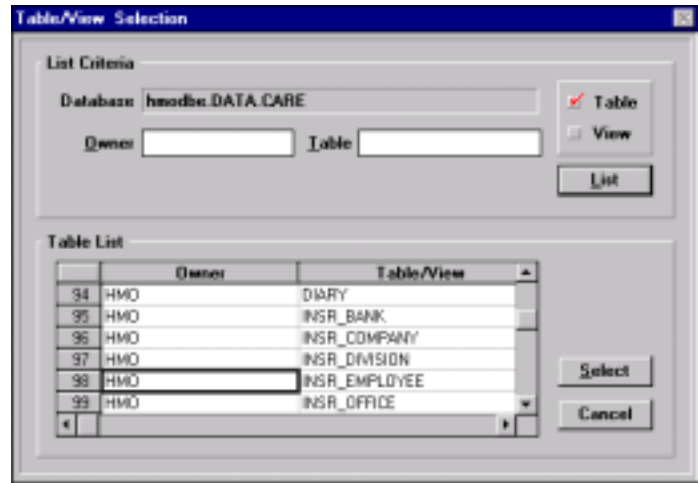
Click   (or select **Table** from the **Query** menu) to activate the table selection window.

The blank Table window provides an area for identifying selected tables and a region that shows their join conditions.



**Figure 4-2. The Table Window Showing the Two-Table Join**

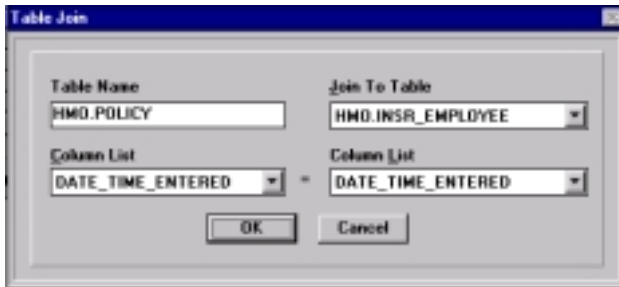
Click on [Add] to select a data source using the Table/View Selection window. In the Table/View Selection window, click on [Table] and/or [View] to check mark the source type. When [List] is clicked on, all tables and/or views are listed in the Table list, unless a restriction of the table list is made. This is done by specifying an Owner or a specific Table name.



**Figure 4-3. The Table/View Window Showing All Tables in the Database**

## Joining Tables

Select a data source, either by double clicking on a row in the Table List, or highlighting a row and clicking on **[Select]**. If this is not the first table selected, the Table Join window appears.



**Figure 4-4. The Table Join Window Showing the Link Between Two Tables**

The join condition specifies fields that link the tables. If more than one table in a query is included, a join condition should be specified for every table after the first. If no join condition is specified, every record in the first table is joined with every record in the second table as long as the selection conditions are met. Such a query can produce lengthy results.

The name of the table just selected is displayed on the left in the Table Join window. The Join to Table field gives a selection list of the tables previously selected. Select a table from the list and select the respective columns they have in common. Click on **[OK]** to return to the Table window, where the join condition expression is displayed.

The process can be repeated to join another table or view by clicking on **[Add]** again in the Table window. The **[Delete]** button removes the selected table or view from the Selected Tables list. To remove a join condition, select it in the list and click on **[Remove]**. To establish a join condition that has not already been established, click on **[Join]** to access the Table Join window.

After selecting source tables and/or views, click on **[OK]** to return to the Query window. The Query window now displays the list of sources in the Selected Tables region. However, the Selected Tables region does not

display join conditions. Join conditions can only be viewed in the Table window.

## Providing an Alias Name for a Table Selection


If a table that has already been selected for output is desired to be selected, an alias name must be provided for subsequent selections. Follow the above steps for selecting a table.



**Figure 4-5. The Table Alias Name Window Indicating that the Same Table was Already Selected**

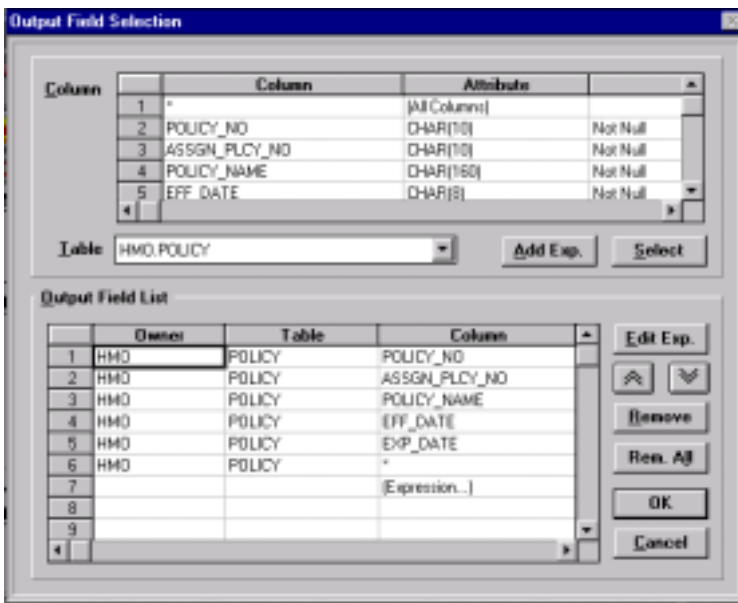
Type an alias name in the Alias Name field, and click on [OK].

## Identifying Output Columns

Click  (or select **Output** from the **Query** menu) to activate the output selection window.



This identifies the output columns. The Column list in the Output Field Selection window shows all the columns for the listed table in the Table field. Select a table name from the Table field.



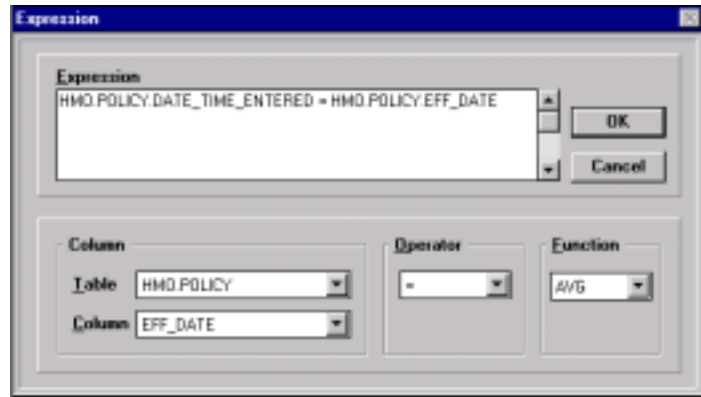
**Figure 4-6. The Output Field Selection Window Completed for a Query**

Move an individual column to the Output Field List by either double clicking on an element in the row or highlighting an element and clicking on **[Select]**. A block move can be done by holding down the active mouse key and dragging the pointer to the row at the other border of the block. Click on **[Select]** to copy all the highlighted columns to the Output Field List.

The first column listed for each source in the Column List is an asterisk (\*). Choosing this entry includes all the columns in the table. If the asterisk is selected, do not include any of the other columns in that source.

To add an expression as the output field, click on **[Add Exp.]** to open the Expression window. The expression is typed or “assembled” in the editing field Expression. A column name in the Column selection list can be clicked on to insert it into the expression. Notice, in the Output Field List, only (Expression...) can be seen under the Column list. Once the expression in the Output Field List has been placed in the Query window, as explained below, the expression’s contents can then be seen. Use the Table selection list to access column names in the various joined tables.





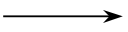
**Figure 4-7. The Expression Window Showing a Simple Expression**

In addition, for convenience, relational operators and notation symbols can be inserted by clicking an element in the Operator selection list. Aggregate functions are provided in the Function list.

After all the output columns are identified, they can be re-sorted into a preferred order. Highlight a row and use the up and down arrow buttons to move the row. Only the highlighted row and the row selected with the arrow button are re-sorted. Highlighting the list row and clicking on **[Remove]** can eliminate individual output columns. To clear the Output Field List and start over, click on **[Remove All]**. The **[OK]** button concludes this transaction, and returns to the Query window, where the selected columns are displayed in the Output Field List.

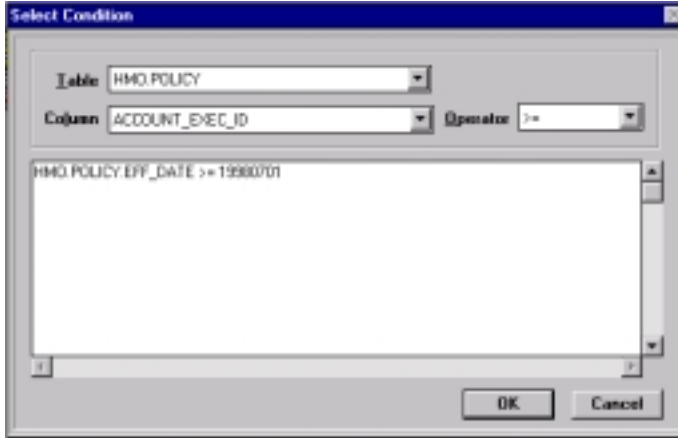
## Specifying Query Selection Criteria

A selection condition can be constructed that becomes part of the query statement along with the join conditions. The selection condition specifies the criteria that rows must meet to be included in the query results. It must be a logical expression. A query can include as many selection conditions as desired, which all need to be connected with the AND/OR operator. The NOT operator cannot be used to reverse the value of a logical expression.

Click  (or choose **Select Condition** from the **Query** menu) to activate the Select Condition window.



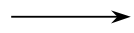
The Column field provides a drop down selection list of all the fields in the table currently in the Table field. Change tables by selecting another from the drop down selection list. The Operator field is a drop down selection list of permitted relational operators.



**Figure 4-8. The Select Condition Window Showing a Simple Expression**

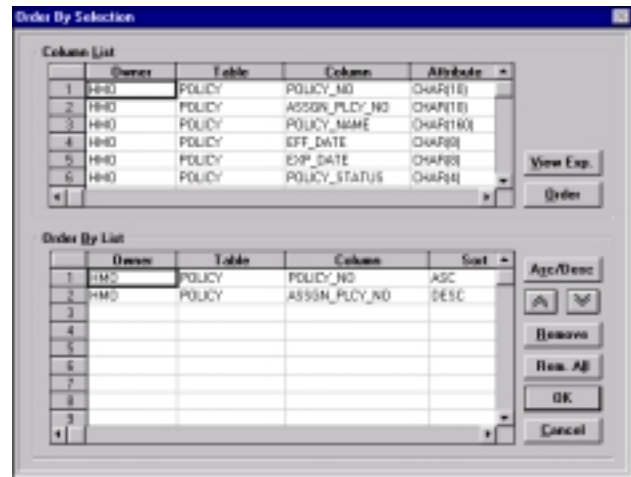
Type the expression into the scrollable editing region. A column name can be popped in at the insertion point by selecting it from the Column drop down list. Likewise, an operator can be inserted. The expression must abide by logical rules. Any parentheses needed to resolve ambiguity must be provided. Click on **[OK]** to return to the Query window, where the selection condition is displayed. **[Cancel]** returns to the Query window with no select condition displayed.

## Specifying Output Sorting Sequence

Click  (or select **Order By** from the **Query** menu) to activate the window.



This sorts the rows in the query result. The Order By Selection window displays a list of the output columns and their attributes. Move an individual column from the Column List to the Order By List either by double clicking on an element in the row or by highlighting an element and clicking on **[Order]**.

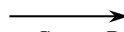


**Figure 4-9. The Order By Window**

After all the sort columns have been chosen, they can be reorganized. Highlight a row and use the up and down arrow buttons to move the row to the desired position in the sort order. The default sort order is ascending (ASC); however, the order can be altered to be descending (DESC), by highlighting the column and clicking on [Asc/Desc].

To remove a selected column, highlight an element in the Order By window and click on [Remove]. To clear the entire Order By List and start over click on [Remove All]. Click on the [OK] button to return to the Query window, where the selected columns are displayed in the Order By region. Click on the [Cancel] button to return to the Query window without selecting any columns.

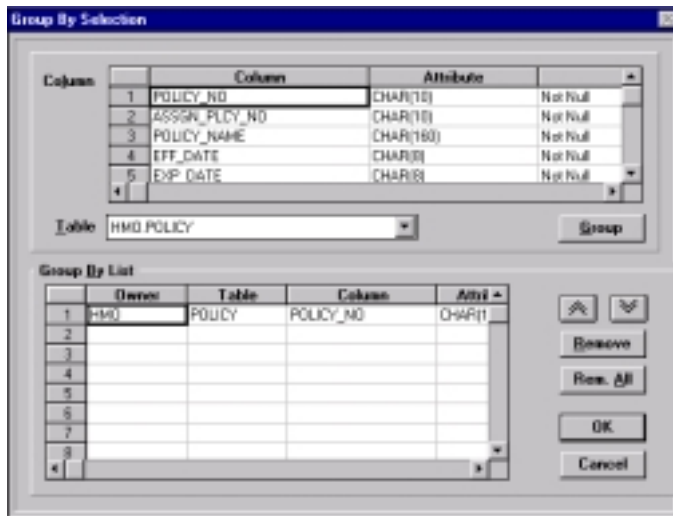
## Identifying Query Output Grouping Specification

Click  (or select **Group By** from the **Query** menu) to activate the dialog window.



This groups rows in the query based on values in one or more columns. The Group By clause defines how to group the query before performing an aggregate function in the Output Field List. The rows that satisfy the expressions

in the Select Condition window are grouped. Therefore, all values in the Output Field List that are not aggregate functions must be selected.



**Figure 4-10. The Group By Window**


The Group By window displays a selection list of columns and their attributes. The columns listed are those contained in the table indicated in the Table field. To switch to another table, select it from the table list that drops down when clicking on the arrow on the right.

Move an individual column to the Group By List by either double clicking on an element in the row or by highlighting an element and clicking on **[Group]**. After moving the columns to the Group By List, which determines how to group the query rows, re-organize them with the major group column at the top. Highlight a row and use the up and down arrow buttons to move the row to the desired position in the sort order.

Highlighting the list row and clicking on **[Remove]** can eliminate a column. To clear the Group By List and start over, click on **[Remove All]**. Click on the **[OK]** button to return to the Query window, where the selected columns are displayed in the Group By region. Click on the **[Cancel]** button to return to the Query window without selecting any columns.

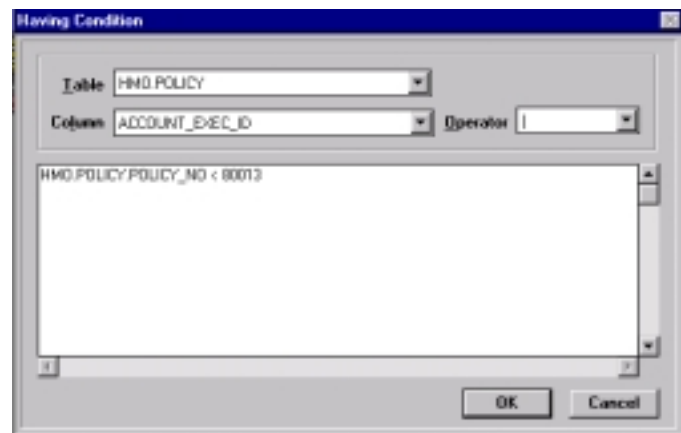
## Identifying Group Selection Criteria

The criteria that groups, as chosen above with the Group By statement, must meet to be included in the query result, can be specified. Having conditions are a subset of the Group By conditions. Therefore, a Having condition without a Group By condition is ignored. Also, expressions in the Having window are more specific than expressions in the Select Condition window. This is because the Select Condition expressions are evaluated first. Then Group By expressions are evaluated within the Select Condition constraints. The Having clause can include as many selection conditions as desired, though it must be connected with the AND/OR operator.

Click  (or select **Having** from the **Query** menu) to activate this optional window.



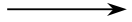
This opens the Having window. The Column field provides a drop down selection list of the table columns indicated in the Table field. The Operator field is a drop down selection list of permitted relational operators.



**Figure 4-11. The Having Window Showing a Simple Expression**

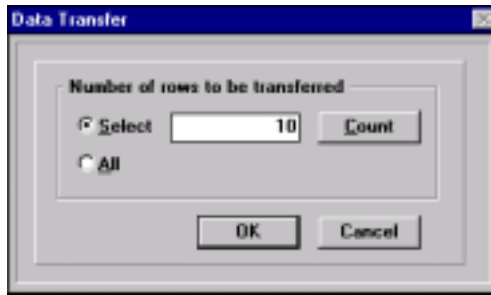
Type the expression into the scrollable editing region. A column name can be inserted at the insertion point by selecting it from the Column drop down list. Likewise, an operator can be inserted from the Operator drop down list. The expression must abide by logical rules. Any parentheses needed to resolve ambiguity must be provided. Click on **[OK]** when done to return to the Query window, where the Having condition is displayed.

## Executing a Query

Click  (or select **Run** from the **Query** menu) to execute the query.



This executes the query. In the Data Transfer window, click on **[Count]** to find the number of rows that are returned when the query is executed. If not all rows are wanted to be retrieved, click on the **Select** radio button, and enter the number of rows that are desired in the field box. Otherwise, Click on the **[All]** radio button to transfer all rows resulting from the query. At any time, the query can be run, its results can be observed and the selection criteria can be refined.



**Figure 4-12. The Data Transfer Window Indicates the Number of Rows to Transfer**

If the query fails because of access or syntax error, an error message pops up. The error code is included so the problem can be researched, if necessary, in the appropriate reference manual. Correct the query and run it again.

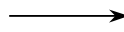
A successful query returns a Query Data window and displays the results in the status bar. The menu changes to include the **Edit** option, while the **Query** option is removed.

	POLICY NO.	ASSIGN POLICY NO.	POLICY NAME	EFF. DATE	PREMIUM EFF. P.
1	00000001	88001	ELM INC.	1987101	14762
2	00000002	88002	PRICE	1987101	162
3	00000003	88003	PARAGON BUSINESS SOLUTIONS	1987101	162512
4	00000004	88004	THE BLIND MAAL INC.	1987101	545255
5	00000005	88005	W3 MEDIA FRAMING COMPANY	1987101	191316
6	00000006	88006	PRENDS R MANAGEMENT SYS.	1987101	161365
7	00000007	88007	WILLER BROTHERS CYPRESS	1987101	166162
8	00000008	88008	CLIFFELL'S BAKERY, INC.	1987101	162421
9	00000009	88009	WHITAKER CONSTRUCTION	1987101	1452625
10	00000010	88010	SMCO, INC.	1987101	1652
11	00000011	88011	WANAICH FRAMING CO.	1987101	162216
12	00000012	88012	ALL WEATHER WATERPROOFING	1988101	144306
13	00000013	88013	GRIFFINS GOLDEN GLOW	1988101	161521
14	00000014	88014	TIMBER PROGE HOME HEALTH	1988101	119163
15	00000015	88015	SALT LAKE MATTRESS MANUFACTURING CO.	1988101	141416
16	00000016	88016	HUNT ELECTRIC	1988101	1452
17	00000017	9100581	TOWER INDUSTRIES	1987101	162321
18	00000018	9100582	ALLIED MECHANICAL	1987101	144325

Figure 4-13. The Query Data Window Displaying Rows Retrieved

The Query Data window shows the data in spreadsheet format. Not only does the spreadsheet scroll, but the cell size can be adjusted to accommodate varying data value size. Drag the boundary between row numbers down to make the row higher, allowing data to wrap. Drag the boundary between column names to shrink or expand columns horizontally.

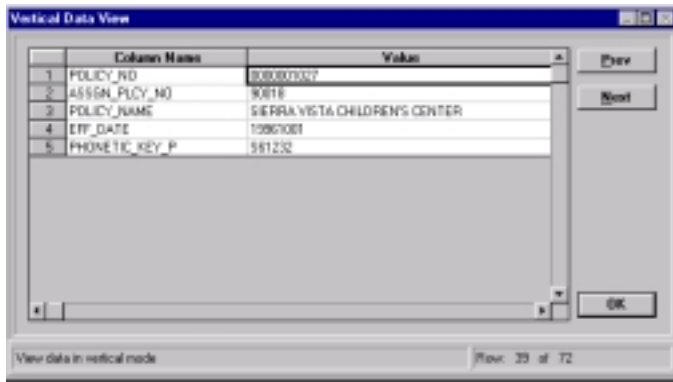
## Viewing Query Output in Vertical Mode

Click  (or select **Vertical** from the **Insert** menu) to open the Vertical Data window and switch the display mode.



It might be easier to view data in *vertical mode*. Click on the *Vertical* icon in the toolbar (or select **Vertical** from the menu) to open the Vertical Data window. In this window, the Column Names from the Query Data window are displayed in the first column. The Values for each row in the Query Data window are

displayed in the second column. To view the previous or next row, click on **[Prev]** or **[Next]**. Click on **[OK]** when done to return to the Query Data window.



**Figure 4-14. Data Shown in the Vertical Data View Window**

A block of cells can be highlighted and copied to the Windows clipboard by selecting **Copy** from the **Edit** menu. From the clipboard, the data can be pasted into another Windows application.

The results can be printed in spreadsheet format by selecting **Print** from the **File** menu.


Query result rows are downloaded to the PC in 60-row increments. This feature is not apparent when scrolling through the rows. It does have implications, however, when copying rows to the clipboard. No matter what rows are highlighted, only the rows from the current page that are part of the 60-row increment are selected. Thus when rows that are not from the same 60-row increment are selected, only the rows of the page currently in use are selected. For example, if rows 40 through 80 are highlighted, only rows 40 to 60 will show up if the current page increment begins at 1. Rows 61 through 80 are retrieved if the current page increment starts at 61.

However, to transport all query results to another application, save the data to a file. With the Query Data window active, select **Save as** from the **File** menu. The standard Windows Save File dialog window opens. A drive letter and directory can be selected and then a file name of no more than 8 characters can be entered. The file extension .TXT is assigned if no extension is provided. All data from the Query Data window is written into

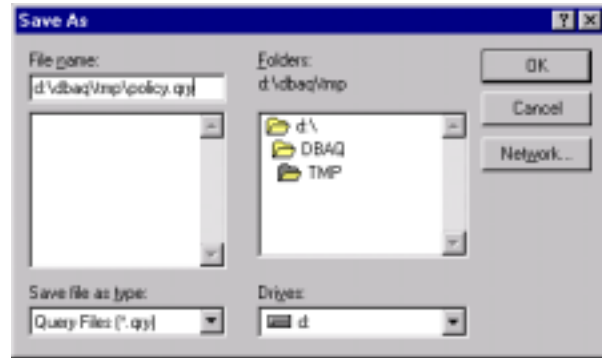


a tab delimited ASCII text file. Each row terminates with a carriage return, line feed. Numerous applications recognize this format.

## Save a Query

Click  (or click **Description** from the **Query** menu) to save.

The query, itself, can be saved to a file. This way it can be used again or as a template for other queries.



**Figure 4-15. The Standard Windows Save As Dialog Window**

The standard Windows Save As window permits changing of the drive letter and directory. Enter up to eight characters as a name for the query file. The file extension of .QRY is automatically assigned if no extension is entered. Click on [OK] to save, and return to the Query window.

It might be useful to document the query before saving it. Thus when the query is run at a later date, the query's purpose and characteristics can be remembered by reading the associated description. Select **Description** from the **Query** menu to open an editing window. If the query has not been previously documented, then this window is empty. Type comments and click on [OK] to return to the Query window. Otherwise, if someone has already documented this query, see the comments in the window. More comments can be typed or the existing comments can be changed.

## Analyzing a Query's Performance

As an advanced database user who has a working knowledge of access plans, this feature allows optimization of data selection. When a query is executed, the optimizer, which is a built-in program, usually generates the

## Query

most efficient path to the desired data. However, the optimizer might not always generate the most efficient path for a query. If the search is through many large tables with many specific clauses, for example, there might be a more efficient searching method.



Click  (or select **Query Analyzer** from the **Query** menu) to analyze a SQL statement. This enters the Query Analyzer mode. The menu and toolbar change to the following:



Figure 4-16. Query Analyzer Mode Screen

## Performance Impact by Index

Click  (or select **Index Info** from the **View** menu) to sort. If the query does any index sorting. The following screen appears:

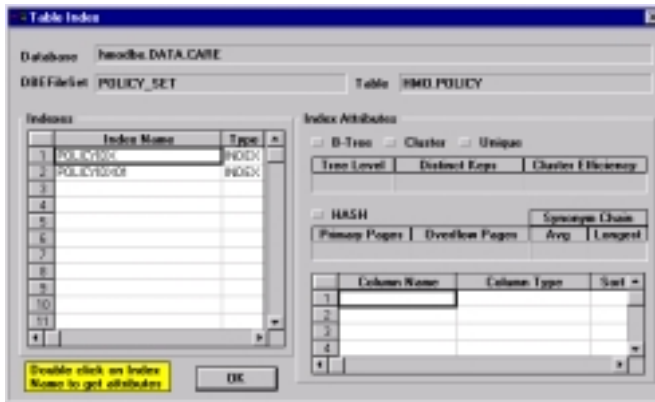



Figure 4-17. The Table Index Window

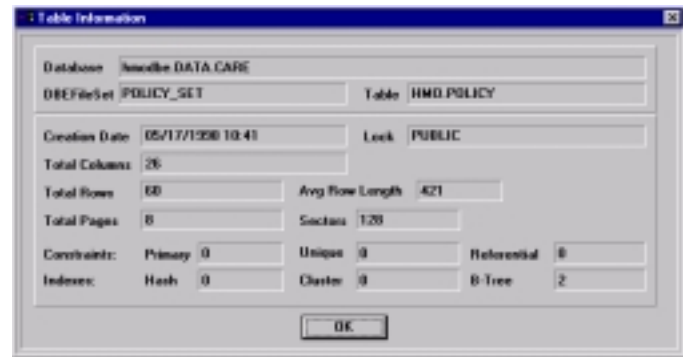
The index names are listed in the Indexes field. Double click on an index name, and the attributes are shown in the fields to the right, as well as which column name. From here, it can be determined whether the query is executing most efficiently, for example, whether the index scan is used.

## Performance Impact by Table

Click  (or select **Table Info** from the **View** menu) to view statistics.




This allow viewing of general table statistics, such as the number of rows. The following screen appears:



**Figure 4-18. The Table Information Window (A Read-Only Window)**

This screen also displays the number of constraints and indexes. This is a good screen to view constraints and indexes are being analyzed.

## Performance Impact by Constraint

Click  (or select **Constraint Info** from the **View** menu) to view constraints.



The constraints screen allows viewing of the different types of table or column constraints that are present. The following screen appears:

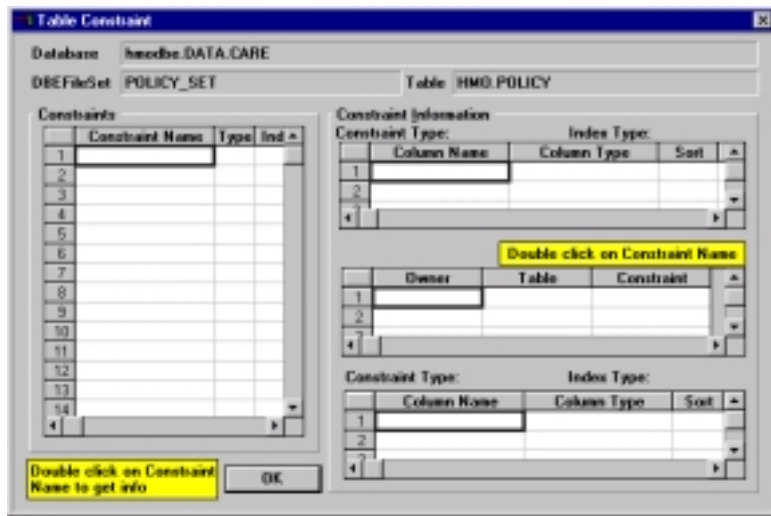
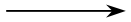


Figure 4-19. The Table Constraints Window

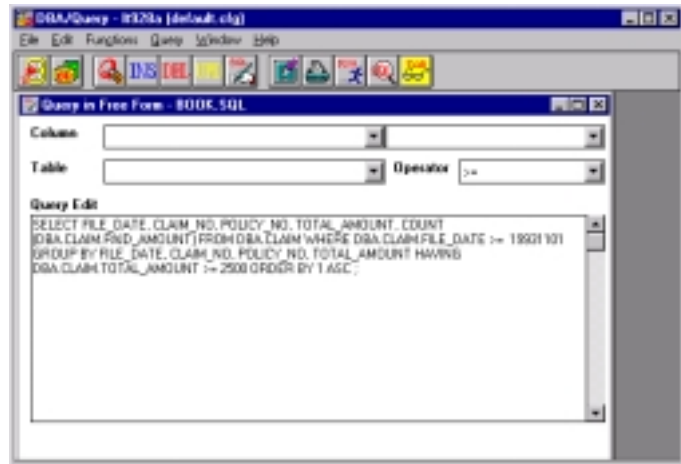
The constraint names are listed in the Constraints field. Double click on a constraint name, and the attributes are shown.

## Creating a Query in Free Form

Click  (or select **Query in Freeform** from the **Functions** menu) to construct queries.




This allows direct writing of SQL queries, if it is more familiar and the query builder is not desired to be used. The Query in Free Form window is displayed.

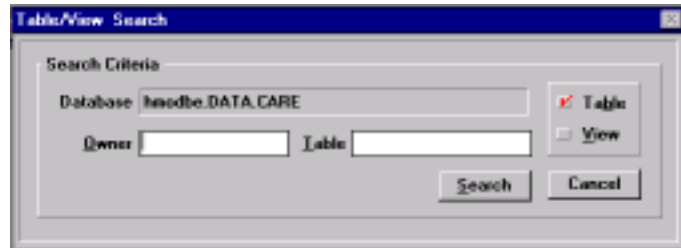


**Figure 4-20. DBA/Query in a Free Form Window with a Written Query**

Select **Edit** from the menu to cut, copy, paste, or delete any text. Copying can be made to the clipboard and to or from other Windows documents.

### Table Name Lookup in Free Form Mode

Click  This allows searching for a particular table. (or select **Table Search** from the **Query** menu) to search for a table.

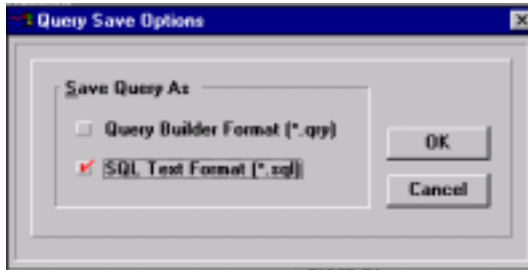


**Figure 4-21. The Table Search Window**

After clicking on [Search], the Table name appears in the Table field in the Query in Free Form window.

## Save a Query while in Free Form Mode

Also, queries that have been constructed with the query builder can be saved. To do this, have the Query window open with the file that is to be converted. Select **File, Save As** from the menu.



**Figure 4-22. The Query Save Options Window Allows Saving in Two Formats at Once**

Select SQL Text Format (\*.sql), which is highlighted by a red checkmark. The query is saved as a .SQL file.

*Note:* When printing a .SQL file, the output consists of SQL statements and their predicates. The printed output appears in a linear format, with each SQL statement neatly arranged in the left column, followed by each of its predicates.

## Printing



In the Query mode, four different windows can be printed from:

- Query
- Query Analyzer
- Query Data
- Query in Free Form

Each of these windows prints different results.

## Query

When printing a query, the output is printed in SQL format, with each SQL statement in the left column.

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## Query Analyzer

When printing from the Query Analyzer, there is an option to choose whether to print from the memory buffer, the screen or a selection. Select from these by highlighting the proper radio button.

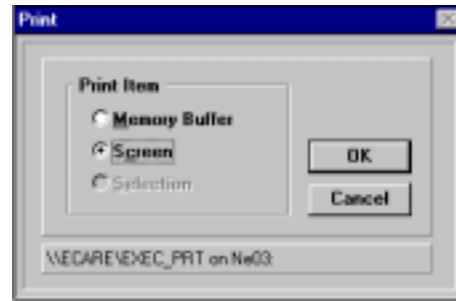


Figure 4-23. The Print Window Possessing Different Options

## Query Data

When printing query data, the same options for printing from the Query Analyzer can be chosen.

## Query in Free Form


When printing a free form query, the output is printed in the same format as query data.

## Opening a Saved Query

To open a previously saved query, select **Open Query** from the **File** menu. The standard Windows dialog window lists all files in the default directory that have the extension **.QRY**, and **.SQL** for those who have designed free form SQL queries. The drive letter directory can be changed as needed. Double click on the query file name or highlight the file name and click on **[OK]**.

The Query window opens, displaying the **SELECT** statement components. The menu and toolbar change as they did when creating a query. Any of the components can be modified before running the query by selecting any of the query tool icons or menu options. The associated dialog window contains the existing specifications. A modified query can also be saved.

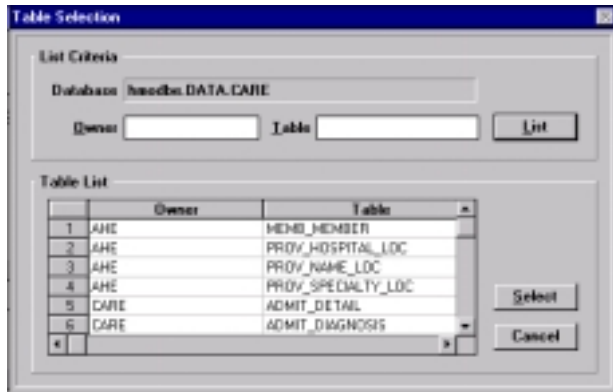
## 5. Insert

Click  (or select **Insert** from the **Function** menu) to activate the insert data operation.

The Insert operation adds new rows into the selected table. If no connection has been made to the host server and the database has not been opened before, a popup window informs of this.

## Selecting Tables

The Table Selection window prompts selection of the target table. An owner or a specific table name can be entered before generating the list of tables by clicking on **[List]**.



**Figure 5-1. The Table Selection Window Listing All Database Tables**

Select the desired table by either double clicking an element in its row or highlighting an element and clicking on **[Select]**. **Edit** and **Insert** options are added to the menu. The *Run* and *Vertical* icons, which are added to the toolbar, are also available by selecting **Insert** from the menu. The Insert Data window appears, displaying an empty spreadsheet.

## Inserting Data

Data can be entered directly into the scrolling spreadsheet. An entered data value scrolls within the cell, if necessary. However, by adjusting the cell height, entered text wraps. The height of a row can be adjusted by positioning the mouse pointer on the boundary between row numbers, holding down the active mouse button and dragging it vertically to the



desired height. Likewise, the width of a column can be adjusted by positioning the mouse pointer on the boundary between column names and dragging it horizontally to the desired width.

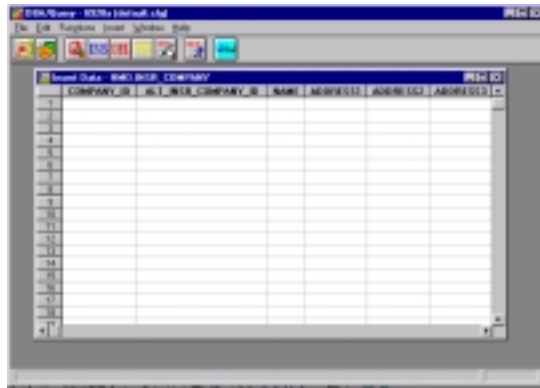
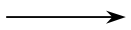



Figure 5-2. The Insert Data Window

Click   (or select **Vertical** from the **Insert** menu) to activate the Vertical Data Insert window.

It may be easier to insert data in vertical mode. Each row of this spreadsheet gives the column name and attributes in the table. The rightmost field is for entering data. One table row can be entered at a time in the Vertical Data Insert window.

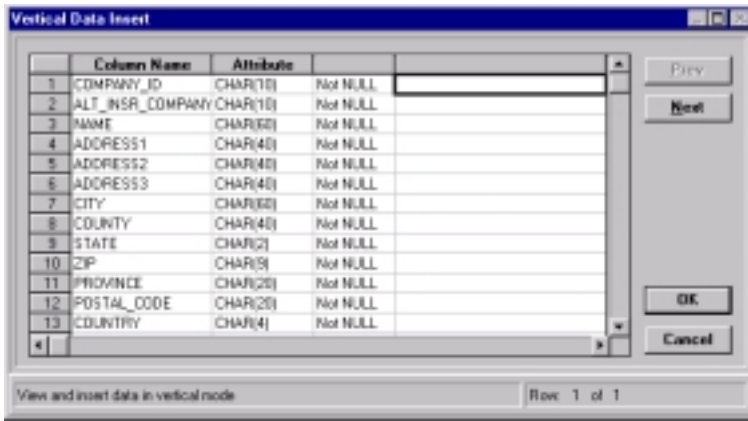
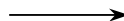


Figure 5-3. The Vertical Data Insert Window for Entering a Single Row

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In either the default spreadsheet or vertical mode, the **Cut** and **Copy** options on the **Edit** menu can be used to move or duplicate data from one cell or a group of cells to another. Either option transfers the highlighted data to the Windows clipboard. Then **Paste** can be selected to transfer the selected data back to the spreadsheet. The **Edit** menu also provides the option to remove the row that is highlighted (that is, the row with the active cell) with **Delete Row**. The **Insert Row** option inserts a blank row above the highlighted row. To view the previous or next row, click on **[Prev]** or **[Next]**. Click on **[OK]** when done to return to the Insert Data window.

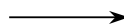
## Executing

Click  (or select **Run** from the **Insert** menu) to execute the insertion process.



When done entering data, the insertion process can be executed. An error in any row aborts the insertion process. All rows preceding the row in error are successfully inserted. The Insert Data spreadsheet displays only the rows that are not inserted. The row in error is the first row shown. Correct the field(s) in error and the insertion process can be run again.

## 6. Delete

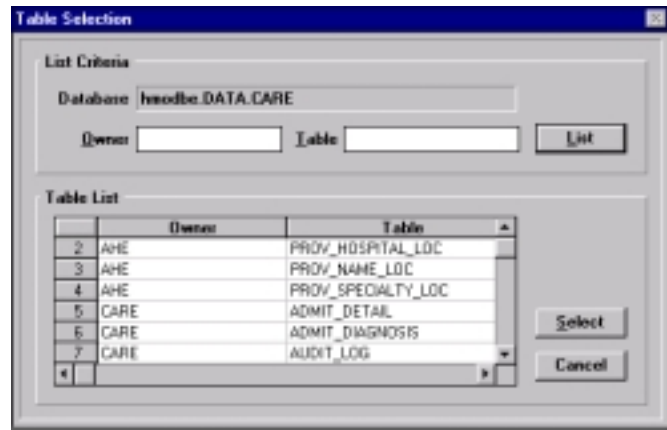
Click  (or select **Delete** from the **Function** menu) to activate the delete operation.



The Delete operation retrieves the rows specified from the selected table, allows confirmation of their deletion and then deletes them from the table. If no connection to the host server has been made and a database has not been opened, a popup window informs of this.

## Selecting Tables

The Table Selection window prompts selection of the target table. An owner or a specific table name can be entered before generating the list of tables by clicking on **[List]**.



**Figure 6-1. The Table Selection Window Listing All Database Tables**

Select the desired table by either double clicking an element in its row or highlighting an element, and click on **[Select]**. The Delete Data window appears, presenting an empty spreadsheet and an editing region to use for constructing selection criteria for data retrieval.

## Deleting Data

The opened database and selected table are identified at the top of the Delete Data window. The Column List includes the names of all columns in the table. The Search Condition editing region allows entering of an

## Delete

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optional logical expression, which is used as the selection criterion for data retrieval. For convenience, a column name can be copied into the expression, at the insertion point, by clicking the column name in the Column List. The expression must abide by the SQL rules set forth in the database reference manual. Compound expressions must be connected with the AND or OR operator. Any parentheses needed to resolve ambiguity must be provided. Click on **[Search]** when ready to retrieve data.

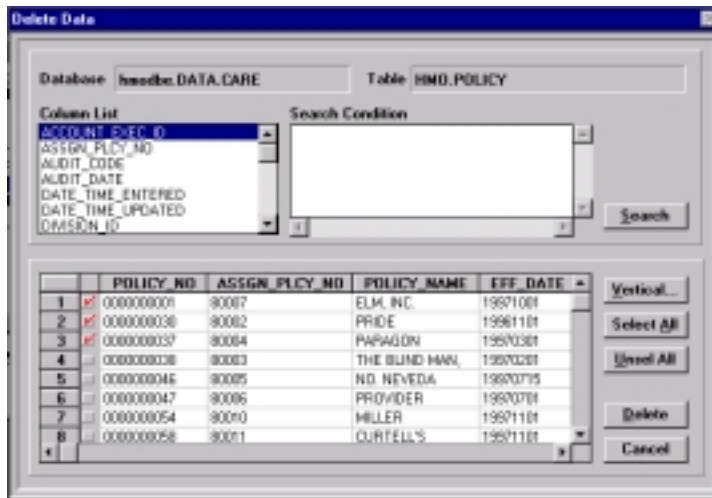


Figure 6-2. The Delete Data Window with Retrieved Rows

## Viewing in Vertical Mode

It might be easier to view data in vertical mode. Click on the **[Vertical]** button in the Delete Data window Vertical Data View window. Each row of this spreadsheet gives the column name and attributes of a column in the table. To view the previous or next row, click on **[Prev]** or on **[Next]**. Click on **[OK]** when done to return to the Delete Data window.

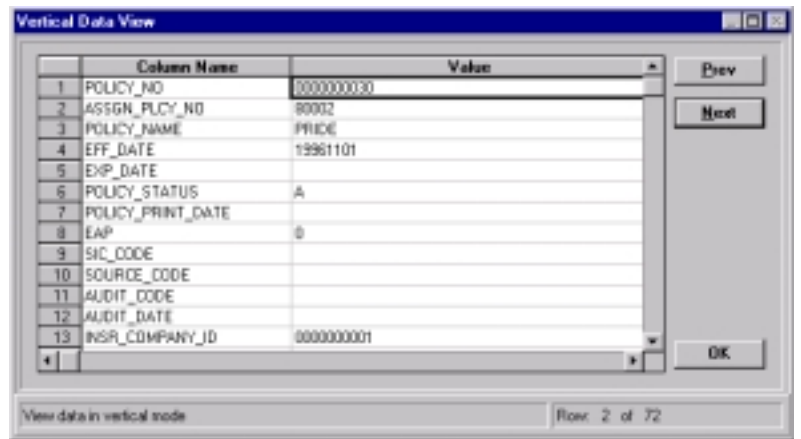


Figure 6-3. The Vertical Data View Window Allows Viewing of the Rows

## Searching for Rows

The Delete Data Search window displays how many rows have been selected and prompts for response of the number of rows to download. A maximum of 100 rows can be downloaded.

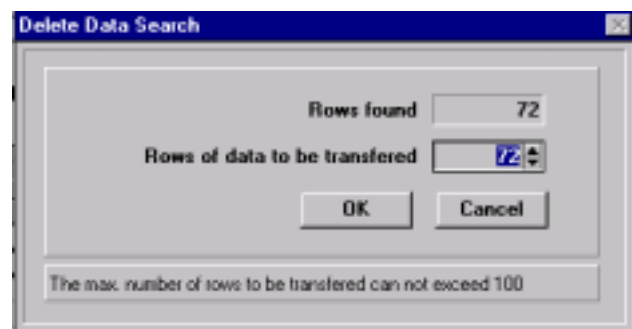


Figure 6-4. The Delete Data Search Window Gives the Number of Rows Found

The downloaded rows are locked for deletion while they are owned. A timer starts as soon as the rows are downloaded. The system administrator sets this timer, mostly for system performance. See the System Configuration chapter for more information on the timer, or consult a


system administrator. When the timer expires, a warning message appears stating “You have locked the transaction for x seconds. Do you want to continue?” Click on **[Yes]** to reset the timer and continue. Click on **[No]** to terminate the operation. If there is no response in x seconds, the operation is automatically terminated and the row locks are released.

## **Executing**

The downloaded rows are displayed in the spreadsheet region of the Delete Data window, for review. Data values scroll within their cells, as necessary. Each row must be check marked for it to be deleted. The button to the left of each row is the check mark toggle. Click it to mark the row. Click on **[Select All]** to check mark all the rows. Click on **[Unsel All]** to remove all the check marks. All of the rows in the Delete Data screen, above, have been checked for deletion. A row will not be deleted unless it is checked.

When done check marking the rows, execute the deletion process by clicking on the **[Delete]** button in the window. The **[Cancel]** button terminates this operation with no rows deleted. Either action releases the row locks.

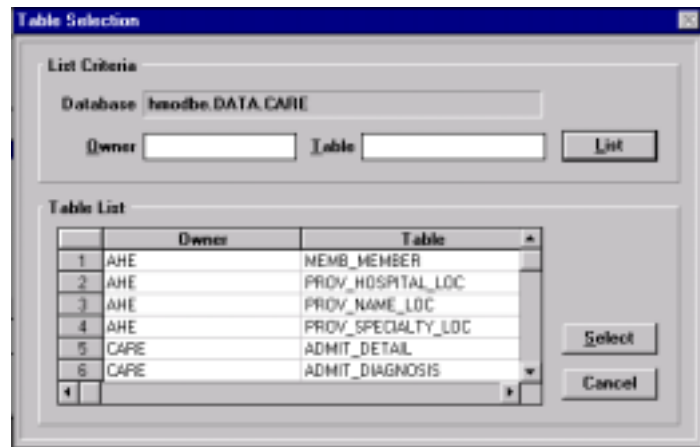
## 7. Update

Click  (or select **Update** from the **Function** menu) to activate the update operation.

The Update operation retrieves the rows specified from the selected table, allows modification of the data and then updates the table. If no connection to the host server has been made and a database has not been opened, a popup window informs of this.

## Selecting Tables

The Table Selection window prompts for the selection of a target table. An owner or a specific table name can be entered or clicking on **[List]** can generate a list of tables.



**Figure 7-1. The Table Selection Window Listing All Database Tables**

Select the desired table by either double clicking on an element in its row or highlighting an element and clicking on **[Select]**. **Edit** and **Update** options are added to the menu. The *Run* and *Vertical* icons, which are added to the toolbar, are also available by selecting **Update** from the menu. The Update Data window appears, displaying an empty spreadsheet and an editing region to construct selection criteria for data retrieval.

## Updating Data

The opened database and selected table are identified at the top of the window. The Column List includes the names of all columns in the table. The Search Condition editing region allows entering of an optional logical expression, which is used as the selection criterion for data retrieval. In formulating the expression, a column name can be inserted into the expression by double clicking on the column name in the Column List. The expression must abide by SQL rules. Compound expressions must be connected with the AND or OR operator. Any parentheses needed to resolve ambiguity must be provided. Click on **[Search]** when ready to retrieve the data.

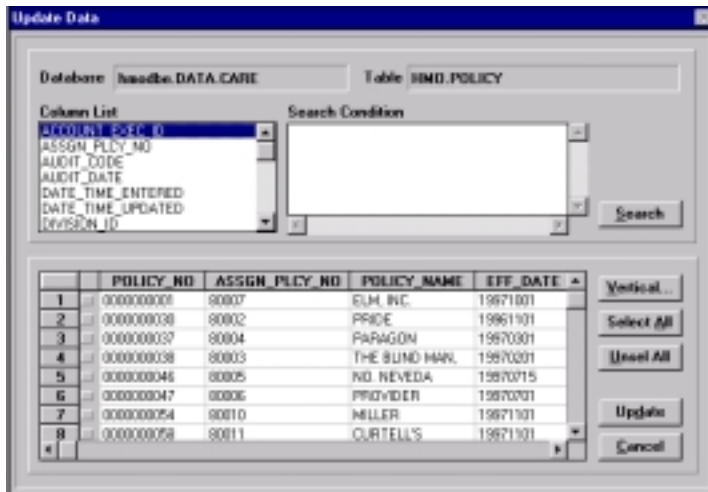


Figure 7-2. The Update Data Window with Retrieved Rows

## Updating in Vertical Mode

It might be easier to update data in vertical mode. Click on the **[Vertical]** button in the window to open the Vertical Data Update window. Each row of this spreadsheet gives the column name, its attributes and the existing data value. The data value can be modified. Only one table row at a time can be displayed in the Vertical Data Insert window. Click on **[OK]** to save the changes and return to the Update Data window. Clicking on **[Cancel]** discards the changes.



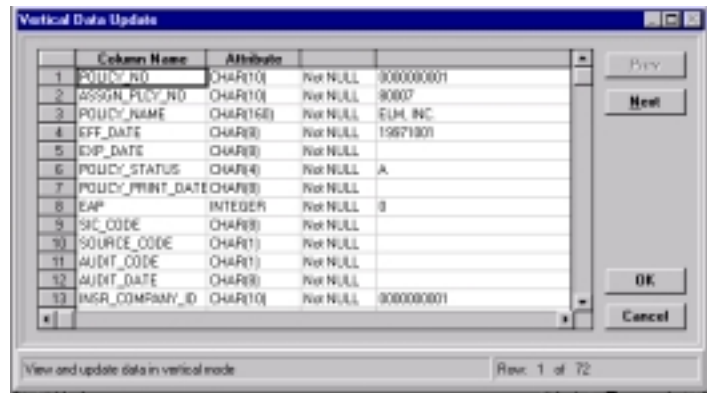


Figure 7-3. The Vertical Data Window for Modifying a Single Row

## Searching for Rows

The Query result window displays how many rows have been selected and prompts for the number of rows to be downloaded. A maximum of 100 rows can be downloaded.

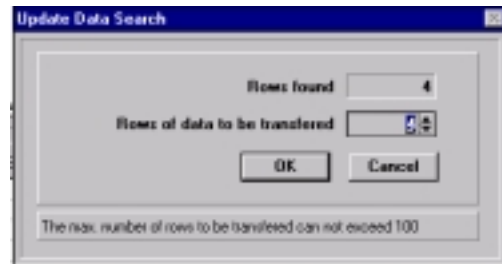


Figure 7-4. The Update Data Search Window Showing the Number of Found Rows

The downloaded rows are locked for update while they are accessed. A timer starts as soon as the rows are downloaded. The system administrator sets this timer, mostly for system performance. See the System Configuration chapter for more information on the timer, or consult a system administrator. When the timer expires, a warning message appears stating "You have locked the transaction for x seconds. Do you want to continue?" Click on [Yes] to reset the timer and continue. Click on [No] to terminate the operation. If no response is made in x seconds, the operation is automatically terminated, and the row locks are released.

## Executing

The downloaded rows are displayed in the spreadsheet region of the Update Data window. The data in the scrollable spreadsheet can be modified. Data values scroll within their cells, as necessary. If the cell height is adjusted, text wraps. The height of a row of cells can be adjusted by positioning the mouse pointer on the boundary between row numbers, holding down the active mouse button and dragging it vertically to the desired height. Likewise, the width of a column of cells can be adjusted by positioning the mouse pointer on the boundary between column names and dragging it horizontally to the desired width.

Before updating the rows, check mark the rows to be updated. The button to the left of each row is a check mark toggle. Click it to check mark the row. Click on **[Select All]** to check mark all the rows. Click on **[Unsel All]** to remove all the check marks. Updates will not be performed on a row unless it is checked.

When done modifying and check marking the rows, execute the update process by clicking the **[Update]** button in the window. An error in a row aborts the update process. Rows preceding the one in error are successfully updated. The Update Data spreadsheet displays only the rows that were not updated. The row in error is the first row shown. The field(s) in error can be corrected and the update process can be run again.

## 8. Security Configuration

To ensure system security, an administrator grants a variety of privileges. These privileges depend on which DBA/Query for Windows functions are needed. Viewing can be done with privileges the administrator has granted. Selecting **File**, then **Preferences** from the main menu can set personal user preferences. The User Configuration window appears. In the left column, choose which configuration to view.

There are six:

- Environment
- Login
- Startup
- User
- Tools
- Restrictions

### Environment

The Environment screen shows which types of databases that can be opened, as well as which operating system is currently running. Only an administrator can set the databases that can be opened.

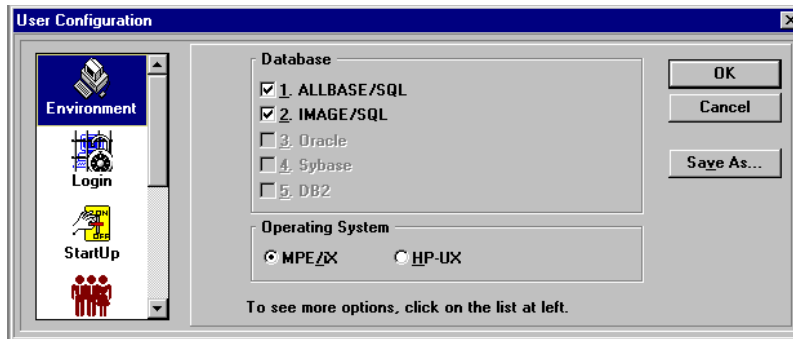


Figure 8-1. The User Configuration Screen Displaying Database Options for Opening ALLBASE/SQL or IMAGE/SQL Databases

## Login

The system can be configured to automatically login to the host system and open the database to be worked on. In this screen, type in the appropriate Connection setting fields and the Database Name. Click on [Save As...] to save the settings.



Figure 8-2. The Login Screen Allows Entering Startup Settings

## Startup

To initiate these login settings, select the appropriate radio button in On Startup, when starting DBA/Query for Windows. Click on [Save As...] so that DBA/Query Windows always starts with this setting.

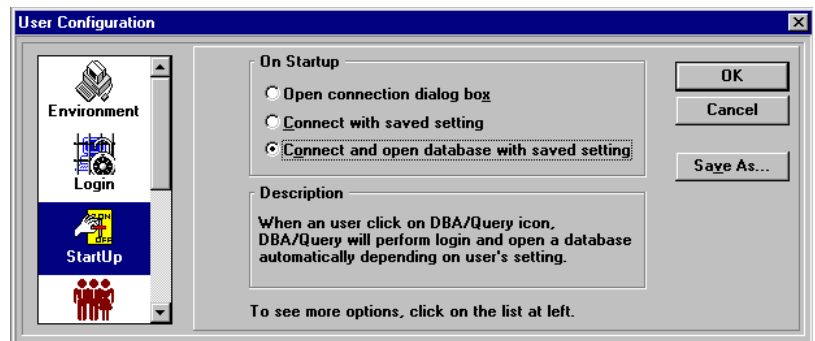


Figure 8-3. The Startup Screen Showing Startup Settings

## User

Personal information can be entered. Type the appropriate information into the fields. When the program is started, this will appear on the opening screen.

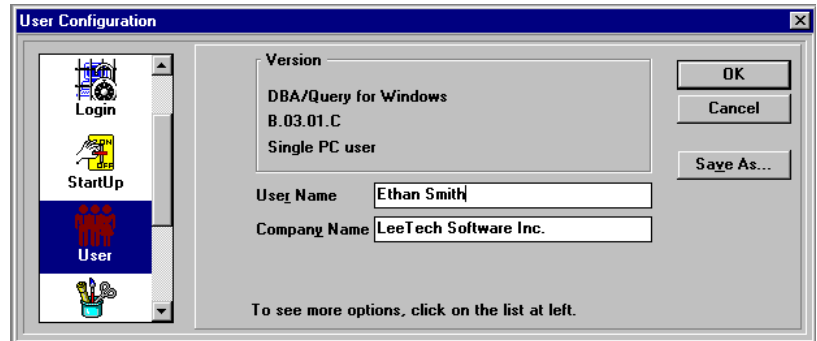


Figure 8-4. The User Screen Showing Name and Company

## Tools

This screen displays what database tools are usable. An administrator sets these options. If more tools are needed, contact the administrator.

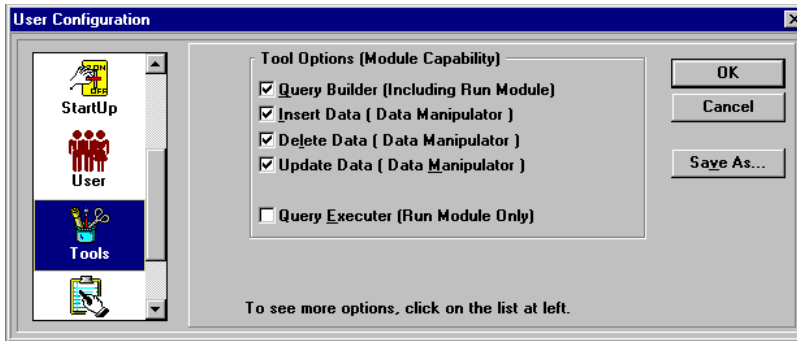


Figure 8-5. The Tools Screen Shows which Tools are Usable

## Restrictions

This screen displays how long rows are locked while updating or deleting. The rows are locked so that others cannot update or delete rows concurrently. See the Delete and Update chapters for more information. Only an administrator can change this setting.

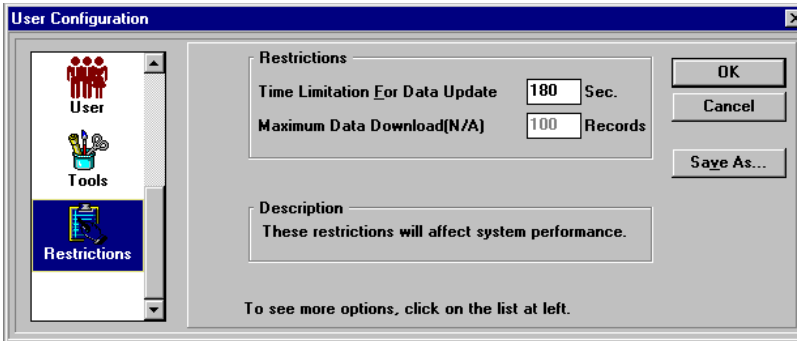


Figure 8-6. The Restrictions Screen Shows how Long Rows are Locked

## 9. Help

The **Help** option on the menu gives access to the DBA/Query online help system. The help provided is context sensitive and includes hypertext links. That is, the subject of the text that appears when **Help** is clicked on pertains to the current function. Topic words and phrases are shown in green. Click on any green word to access its specific help information.

Use the mouse to resize the help window. A page of text can scroll in the window. Access additional pages by clicking the right and left arrow buttons below the horizontal menu.

Return to the main index of topics by clicking on the [**Contents**] button. Exit the help system by choosing **Exit** from the **File** pull-down menu or clicking on the Control-menu box in the upper left corner.

The horizontal menu showing between the window title and the row of control buttons is the standard Windows Help menu. Read general Windows help information for explanations on how to use the built-in help system.

---

---

## 10. Installation

DBA/Query for Windows is supplied in two parts, a client and a server component. The client software is available on 3.5 inch high density floppy disks or CD-ROMs suitable for installation on a standard PC. The HP 3000 server software is on 1600 bpi magnetic tape or DAT tape, as ordered. The DBA/Query for Windows client and server programs are installed separately. The server software generally follows accepted conventions for HP installations. The client software follows conventions for Windows product installations. Installation programs are provided for convenience.

DBA/Query for Windows is to be installed on a local area network. It is based on the protocol TCP/IP and uses Windows SOCKET. It supports:

- Standard TCP/IP and WinSock
- APRA Socket
- Microsoft LAN Manager TCP/IP and WinSock
- Microsoft NT/Server TCP/IP and WinSock
- Novell TCP/IP and WinSock
- ftp TCP/IP and WinSock
- WRQ RNS TCP/IP and WinSock

### Installing the Server

#### Installing on MPE/iX

1. Log on as system manager:  
: **HELLO DBAINSTL, MANAGER.SYS**
2. Identify the tape device:  
: **FILE T; DEV= TAPE**
3. Mount the DBA/Query for Windows tape and place the drive online.
4. Restore the DBA/Query for Windows installation job into PUB.SYS:  
: **RESTORE \* T; DBAINSTL.PUB.SYS; SHOW**
5. Insert the System Manager password into the installation batch file DBAINSTL.PUB.SYS and then stream it:  
: **STREAM DBAINSTL.PUB.SYS**
6. The DBA/Query for Windows installation job builds a new account called LEETECH and then prompts for the installation tape. If the tape



## Installation

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is already mounted, simply place the drive online. Otherwise, remount the tape.

7. The DBA/Query for Windows installation job restores the files into PUB.LEETECH.
8. Purge the batch file DBAINSTL.PUB.SYS upon successful completion of the installation:  
**: PURGE DBAINSTL.PUB.SYS**

### Entering the LeeTech Account

1. LEETECH account access security required:  
(R,X:ANY;W,A,L:AC)
2. LEETECH account capability required:  
AM,AL,GL,ND,SF,BA,IA,MR,DS,PH,PM
3. PUB.LEETECH group access security required:  
(R,X:ANY;W,A,L,S:AC)
4. PUB.LEETECH group capability required:  
BA,IA,MR,DS,PH,PM

### Starting the MPE/iX Server

Stream this batch file:

**: STREAM JLISTNER.PUB.LEETECH**

### Installing on HP-UX

1. "Root" authority is necessary to restore the server files with correct attributes.
2. Mount the DBA/Query for Windows tape and place the drive online.
3. Restore the DBA/Query for Windows files INSTALL and LEETECH.0:  
**\$ tar xvf /dev/rmt/0m (device name)**
4. Run INSTALL. It will create the following directories if they do not already exist:  
\$/opt/leetech/bin  
\$/opt/leetech/lbin  
\$/opt/leetech/lib  
\$/opt/leetech/share

```
$/opt/leetech/share/include
$/opt/leetech/newconfig
$/etc/opt/leetech
$/var/opt/leetech
```

5. Delete the files INSTALL and LEETECH.0 upon successful completion of the DBA/Query for Windows installation:  
**: rm INSTALL LEETECH.0**

The installed files are:

```
$/opt/leetech/bin/lanutil
$/opt/leetech/bin/ltupgrad
$/opt/leetech/bin/ltvalida
$/opt/leetech/newconfig/DBAQB
$/opt/leetech/lbin/dvqry
$/opt/leetech/lbin/listner
$/etc/opt/leetech/CNTLDBAQ.PUB.LEETECH
```

### Starting the HP-UX Server

The listener is a server daemon that should be launched before any client-server connection. To start the listener:

```
$/opt/leetech/lbin/listner DBA
```

## Monitoring the Connection

On the server side, manage the user connections by running:

```
MPE/iX - LANUTIL.PUB.LEETECH  
HP-UX - /opt/leetech/bin/lanutil
```

```
LANUTIL(A.01.00) LeeTech Software Inc. All Rights Reserved.
```

Commands:

```
LIST      - shows all connected users.
KILL id   - kills the specified user.
STOPALL   - terminates listener and all users.
HOST id   - sets to new host node name.
APPL id   - sets to new application name.
EXIT      - ends the LANUTIL.
```

```
LANUTIL>>
```

## **Installing the Client**

The DBA/Query for Windows client software is a standard .EXE program that can be executed from the Program Manager in Windows. Install the client software on each PC used to access databases.

System Requirements:

- IBM or compatible PC
- 80386 or above
- Hard drive with at least 3 megabytes free
- VGA or SVGA monitor
- Mouse
- Windows 95/98/NT

The DBA/Query for Windows Setup Utility provides options for a single PC installation. For a single PC installation, DBA/Query for Windows and accompanying files are copied to the PC's hard drive and the DBA/Query for Windows program group is created within Windows. DBA/Query for Windows can then be executed at any time from the icon in Program Manager.

## **Installing a Single Workstation**

1. If not already running, load Windows.
2. Insert the DBA/Query media into the appropriate drive for installation.
3. Choose **File, Run** from the Program Manager main menu.
4. Type **Setup** in the command line text box.

**The rest of the steps later**

## **Configuring the LAN**

**SERVICES file**

1. Find the SERVICES file, and insert the line:  
**DBA 32600/tcp dba**

DBA is the application name or the socket name that is issued by the sample program. The “32600/tcp” portion of the entry is the port ID, which must be identical to the server’s SERVICES file (please see the host server section of this manual). It is the common name used to link the PC client program and the host server program. The “dba” portion of the entry is another alias of DBA and 32600/tcp.

2. The SERVICES file on the PC is located in:

<b>Win 95/98</b>	\windows\
<b>Win NT</b>	\winnt\system32\drivers\etc\

**HOSTS file**

3. Find the HOSTS file on the PC and insert the host IP Address and its alias (node) name. Use PING.EXE to verify that the host IP Address is correct.

4. The HOSTS file on the PC is located in:

<b>Win 95/98</b>	\windows\
<b>Win NT</b>	\winnt\system32\drivers\etc\

5. The socket driver must exist. Make sure the winsock.dll file is accessible. It must either be in the \windows directory or in a directory listed by the path variable.

## 11. Customer Support

LeeTech Software Inc. is dedicated to providing the highest quality software products available. In addition, LeeTech believes that high quality, knowledgeable support is an essential element for full utilization of the supplied products. LeeTech has thus structured a complete support package that is available with all supplied products.

All support contracts include telephone or message based support. LeeTech's staff is qualified to assist not only with product use, but also with any database problems customers may have. If problems prove extensive and outside the scope of the maintenance contract, LeeTech can still assist with low cost consulting.

In addition to specific service requests, LeeTech provides users with periodic newsletters, software bulletins and other materials designed to help ensure effective use of LeeTech products. To be placed on the mailing list, simply send a request to LeeTech.

LeeTech customer service may be contacted by any of the following.

### Mail

Please send all inquiries or problems to:

LeeTech Software Inc.  
2085 Hamilton Ave., Suite 200  
San Jose, CA 95125  
U.S.A.

### Telephone Support

All LeeTech customers with a current support services contract can contact LeeTech at the following numbers.

U.S.A.	(800) 995-1987
All Other Countries	(408) 253-1987

## **Fax-Back Service**

LeeTech maintains a 24-hour Fax number for customer input. Questions regarding support services will receive immediate attention at the beginning of the following business day. Responses will be returned by Fax or by the method designated on the submission.

Fax Number (408) 558-0802

## **Electronic Messages**

Questions or input can be made via electronic mail.

- Support needs can be mailed to:

support@leetech.com

- Information inquiries can be mailed to:

info@leetech.com

- All product and sales needs can be mailed to:

sales@leetech.com

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