# APPGEN
## QUERY LANGUAGE

REFERENCE MANUAL

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# APPGEN
## QUERY LANGUAGE

### INTRODUCTION



### NEW OR OCCASIONAL USERS



### DAY-TO-DAY USERS



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**ADVANCED USERS**

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## 1.0 INTRODUCTION TO AQL

The Appgen Query Language (AQL) is a report-generating inquiry language for use with all Appgen relational data base files built by the various Appgen business accounting modules. Reports using Appgen Query Language can be generated in a fraction of the time needed to write code with output ranging from simple listings to elaborate reports.

For the new or occasional user, Appgen Query Language offers direct inquiry into the data base and timely generation of ad-hoc reports. No programming or data processing experience is required; the use of the Appgen Query Language commands do not add to, change, or delete from the files being accessed. Commands are entered in English-like sentences and execute immediately; the resulting output may be directed either to the screen or to the printer. There is no need to understand either the application software modules or the computer's operating system in order to use AQL to produce reports.

This manual is organized and written for three different levels of users: the new or occasional users, the day-to-day users who work primarily with the accounting application packages, and the advanced users who want to produce customized reports.

The sections of this manual are arranged in order of increasing complexity (and increasing capability) from the straightforward procedures used by new/occasional users, through extremely powerful dictionary item manipulation functions used by advanced personnel. Chapters two, three, and four are designed for the orientation and instruction of a new user, as well as for a quick refresher and reference guide for the occasional user. Chapters five, six, and seven are intended for data processing oriented personnel (accounting managers, system operators, etc.) who wish to create more elaborate Appgen Query Language reports. Chapters 8 through 11 contain technical information to enable advanced users, programmers, and system installers to write reports that not only extract data from the data base files, but also perform manipulations and calculations upon that data prior to printing.

For programmers and technical personnel, knowledge of UNIX gives further advantages in the use of Appgen Query Language. Commands are entered at the shell and read by the operating system before passed to AQL. This arrangement enables the full operating range of UNIX commands and editors to be combined with the speed and versatility of Appgen Query Language. Files being developed may be accessed and inspected without delay or prior arrangement. Prototype reports in a wide variety of formats, styles, and content can be generated in minutes. Existing programs can be customized or modified in less time and new applications generated with greater speed.

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## 1.1 THE NEW OR OCCASIONAL USER

Appgen Query Language may be used by personnel who have little or no data processing experience, but require access to information in the data base for evaluation and decision making.

The Appgen Query Language program is non-procedural and non-processing. This means there is no programming code to write or complete and that Appgen Query Language sentences (commands) do not add to, change, or delete the information in the data base.

Accessing the data base file of your choice, Appgen Query Language retrieves all information you request and reports it back to you according to your specifications. You can learn the basics of Appgen Query Language in one to two hours at the computer terminal. More elaborate record selection and formatting skills may quickly be mastered after that.

The chapters of the manual marked for the "New/Occasional Users" have been designed to serve both as a tutorial in learning the capabilities of Appgen Query Language and as a ready reference guide for later use.

Chapter two covers an orientation to data bases and computer files for the new user who wants a visual concept of how computer data storage files are organized.

Chapter three is a step-by-step guide to producing meaningful Appgen Query Language reports in less than one hour. Through the use of a set of progressive examples, the capabilities of Appgen Query Language are demonstrated. A matching sample data base is included with your copy of Appgen Query Language to allow you to perform the examples on your own system. While these examples are very straightforward, they are also comprehensive enough to train you to use the majority of AQL commands.

Once you have learned how to create Appgen Query Language reports, you may immediately go on to produce mailing labels from your data base as described in Chapter four.

## 1.2 DATA PROCESSING PERSONNEL

If you are a data processing oriented person who uses the computer system on a regular basis (accounting, data base entry, etc.), you will find the information in Chapters five, six, and seven allows you to create formatted reports with headings, footings, time, date, specific length and width, etc., as well as subtotals and specialized groupings of the output data.

You do not need to know programming or even understand the operating system to produce these more elaborate Appgen Query Language reports. At this level, Appgen Query Language may be thought of as a results-oriented report generator.

## 1.3 ADVANCED USERS AND PROGRAMMERS

Chapters eight through ten contain more detailed information on the Appgen file structure and manipulation of the Appgen Query Language output data through the use of Appgen Dictionary Items. These capabilities allow you to create very clear and comprehensive Appgen Query Language reports.

Appgen Query Language accesses the data files created by Appgen applications. The Appgen file structure is a relational data base with each Appgen file actually consisting of two files; the data file itself and a "dictionary" file that contains items defining the fields in the data file record format.

Dictionary Items are used to describe the characteristics of the fields, including an optional fieldname by which each field may be accessed using Appgen Query Language. Additional Dictionary Items may be created in the dictionary file to perform manipulations (or mathematical/logical functions) upon the current values of one or more other fields of the record. For instance, if an inventory master record contained only the quantity and unit price of an inventory item, a Dictionary Item could be added to multiply these two values giving an extended total which may be printed on an Appgen Query Language report.

The Appgen Query Language sentence typically accesses records only from the primary file specified in the sentence; data from secondary files may also be included on Appgen Query Language reports through the addition of special Dictionary Items as described in Chapter nine.

## 1.4 INSTALLATION OF APPGEN QUERY LANGUAGE

AQL is installed automatically along with the Appgen Run Time or Development System.

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## 2.0 IF YOU DON'T UNDERSTAND DATA BASES AND COMPUTER FILES

This chapter is included to give the non-technical person a visual concept of data bases and computer files and to define a few of the terms and concepts that are discussed in this manual.

## 2.1 DATA BASES

The term "data base" is used by technical computer personnel to refer to the collection of information that is available to the computer system for reference and processing.

"Data base" is a nebulous term in that its size is not of any particular magnitude; it may be small (fifteen or twenty customer records) or large (comprised of thousands of inventory item records). Its scope is also nebulous: the customer records form a data base while the inventory records form a separate data base, and the entire collection of all records are also referred to as a data base. In other words, it may be a set of similar records, or it may be comprised of a number of other data bases.

Since there is no widely accepted specific definition of a "data base", think of it as a set or subset of the records stored in the computer.

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## 2.2 COMPUTER FILES

Using Appgen Query Language allows accessing data from the computer files which make up your data base (or, your collection of data bases if you prefer to think of your files as being multiple data bases).

Figures 2.1 and 2.2 show the relationship between computer files and the office files which we more commonly encounter. There is a direct one-for-one correspondence between conventional manual filing systems and computer files.

The numbered items below describe the relationships between manual files and computer files as shown by the corresponding circled number in Figures 2.1 and 2.2.

1. The computer disk storage unit is like a group of file cabinets. It is divided into storage sections called "directories".

2. A directory on the disk is like a single file cabinet. There is one directory for each unique application area (Accounts Receivable, Accounts Payable, Installed Customer Records, etc.).

3. A computer file within a directory is like a file drawer; it contains records of the same type such as the Customer Master records or the Open Items records in Accounts Receivable.

Figure 2.1

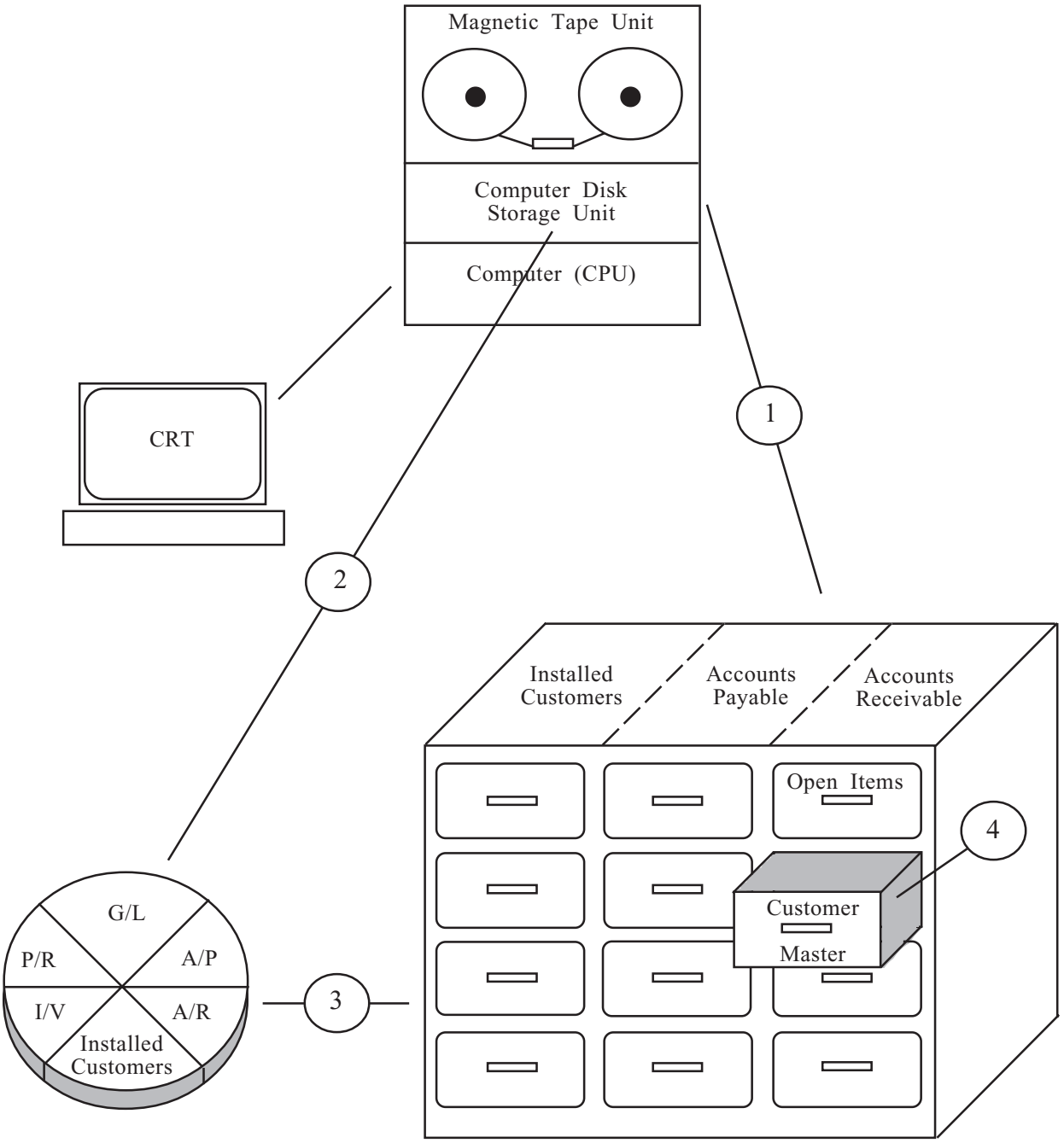


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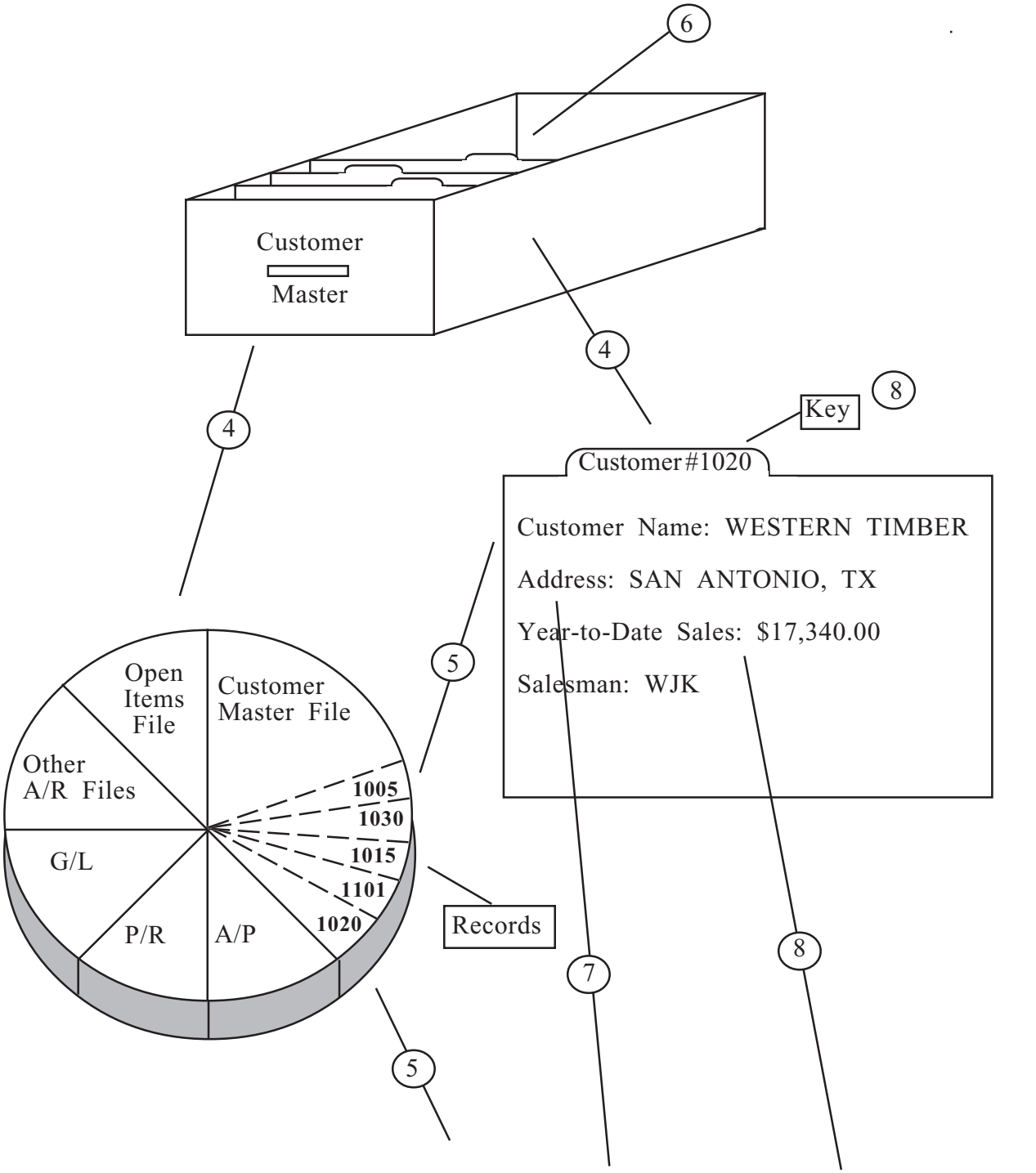
Figure 2.2




| Customer# | Customer Name | Address | YTD Sales | Salesman |
|---|---|---|---|---|
| 1020 | Western Timber | San Antonio, TX | 17,340.00 | WJK |

4. Records in computer files are like filled out form sheets in a file drawer. Each record contains the associated information for one customer or for one A/R Open Item transaction.

5. Records are located in computer files by their "keys". The "key" is like a filing tab on the form sheet.

6. A "field" in a computer record is like a "blank" on a form sheet. Data values go into fields in computer records just like written values go into the blanks on the form sheets.

7. Fields in computer records have names just like blanks on form sheets have names associated with them.

SUMMARY

| Computer Files | Your Office Files |
|---|---|
| Disk | Group of file cabinets |
| Directory | File cabinet containing files for one application area (A/R, A/P, or P/R, etc.) |
| File | File drawer containing one type of record (Customer Master, Open Items, etc.) |
| Record | Completed formsheet |
| Field | The "blank" on a formsheet |
| Field Name | Name of the "blank" on a formsheet |

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## 3.0 GETTING RESULTS IN ONE HOUR

This chapter is designed to acquaint new Appgen Query Language users with the capabilities of Appgen Query Language using the "hands-on" method. It is also set up to serve as a handy reference for the occasional user who does not plan to become proficient in the use of Appgen Query Language.

A sample customer data file has been included with your Appgen Query Language software package. You should use this data file and the terminal keyboard to perform the examples shown in this chapter.

Preparing an AQL report consists of two steps: 1) breaking out of a main menu screen, and 2) entering an Appgen Query Language (AQL) sentence. This AQL sentence accesses the data base file of your choice, retrieves information, and reports it back to you according to specifications contained in your AQL sentence.

Using only the Customer Name, City, and Year-to-Date Sales Amount, you are able to prepare the following reports:

1. A list of all records in this data base file;
2. An alphabetical list of customers;
3. A list of all records sorted by ascending or descending sales amounts, showing customer name and city;
4. A list of only those customers in a specified city showing their Y-T-D sales figures;
5. A list of customers with a Y-T-D sales amount above a specified amount;
6. A list of customers in a specified city with Y-T-D sales above a specified amount.

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## 3.1 GETTING STARTED

To enter an Appgen Query Language Sentence and get the computer system to prepare a list, you must:

1. Be in the right directory;
2. Know the correct name of the data base file to be used;
3. Know the correct names of the fields in the record;
4. Enter an Appgen Query Language Sentence specifying the desired list.

### Using the Keyboard

To perform the examples of this section, you must be able to use the terminal and keyboard on your computer system. Specifically, you need to know how to:

1. Shift to upper case or lower case;
2. Back up to correct typing errors;
3. Use the 'ENTER', 'NEW LINE', 'RETURN', or 'CR' key;
4. Abort a long list.

If you do not know which keys perform these functions, ask someone at your computer site to give you a short lesson in keyboard usage.

### Getting To The Correct Directory

To access information from an Appgen application file, you must have your computer terminal "connected to" the same directory where the desired file is located. The process for connecting to the proper directory is:

1. Go to the main menu for the desired application area (Accounts Payable main menu, Accounts Receivable main menu, etc.).

2. In answer to the prompt question, enter '!sh' instead of a menu choice number. Your system should respond by clearing the screen and then displaying a '$' near the top of the screen. You may now enter an AQL Sentence.

### Getting The Correct Filename

You must specify the file's name exactly as the computer knows it. The computer filename is case-sensitive so you must use upper case and lower case letters identical to the computer's spelling of the filename. Example: 'Cust' is not the same as 'cust' to the computer.

At the '$' prompt enter a command of: 'ls' (lower case without the quote marks) to get a display of the filenames in this directory.

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### Getting The Correct Fieldnames

Again, the computer is very exacting in the spelling of a fieldname. Be careful of the case (upper or lower) and include any punctuation marks exactly as shown. To see the fieldnames and a short description of each field as they appear in the Dictionary File, enter:

AQL Sentence:

```
SHOW D.cust Key Desc
```

Results:

This command displays the fieldname as the computer knows it (CUST.NO) along with the short description (Customer Number).

Display:

| ——KEY—— | ————Desc———— |
|---|---|
| CUST.NO | Cust # |
| CUST.NAME | Customer Name |
| ADDR | Address |
| YTD.SLS | YTD Sales |
| SLS.NO | Sls # |
| ... | ... |
| (etc.) | (etc.) |

### Entering an AQL Sentence

In response to the '$' prompt enter an AQL Sentence.

After the display of the resulting output data, the '$' prompt again appears. Enter another AQL sentence or return to the application main menu you exited in step one above.

### Returning To The Application Menu

To return to the application main menu, press the CONTROL key (marked CNTL or CTRL) as if it were a shift key and simultaneously press the 'D' key. The system responds with the message 'Hit return to continue'. Press the return key (marked RET, ENTER, or NEW LINE); the application main menu reappears.

## 3.2 SHOW FILENAME

A display showing all records in a file may be produced. If no fieldnames are included in the sentence, only the key to the records is shown. Various fields may be displayed by including the desired filenames in the AQL Sentence.

AQL Sentence:

SHOW cust CUST.NO CUST.NAME ADDR YTD.SLS

Results:

Displays all records in file 'cust' showing customer number, name, address, and year-to-date sales.

Display:

| Cust # | ----------Customer Name---------- | ----------Address---------- | -YTD Sales- |
|---|---|---|---|
| 3055 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| 3005 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| 3015 | M. J. ROTH AND CO. | NEW ORLEANS, LA. | 6,350.00 |
| 3010 | BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| 3020 | WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| 3025 | MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| 3030 | GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| 3050 | FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| 3035 | THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 102,500.00 |
| 3040 | STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| 3170 | AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| 3190 | HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| 3060 | GOLIATH | DALLAS, TX. | 18,200.00 |
| 3065 | THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| 3070 | EASTERN SALES | DALLAS, TX. | 92,510.00 |
| 3075 | NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| 3090 | CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| 3085 | BINDER PRINTING | NEW ORLEANS, LA. | 6,200.00 |
| 3095 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| 3100 | DYNAMIC VENTURES INC. | DALLAS, TX. | .00 |
| 3105 | JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| 3115 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| 3120 | AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| 3125 | STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| 3130 | UNITED METALS | NEW ORLEANS, LA. | 4,380.00 |
| 3145 | AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| 3135 | PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| 3140 | MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| 3150 | TELEPORT INC | DALLAS, TX. | 14,250.00 |
| 3155 | OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| 3160 | DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| 3165 | STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| 3175 | COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| 3185 | CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |
| 3180 | LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| 3080 | JOHN STEADY AND COMPANY | HOUSTON, TX. | 91,050.00 |
| 3110 | U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| 3045 | THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |

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### 3.3 SHOW FILENAME BY

Appgen Query Language can sort the listing by any field in ascending or descending order.

Appgen Query Language allows multi-level sorting, i.e., sorting within sorting. An example would be sorting by address, then alphabetically by customers at the same address.

The fields to be displayed must also be entered in the AQL Sentence.

AQL Sentence:

SHOW cust BY CUST.NAME CUST.NO CUST.NAME ADDR SLS.NO

Results:

Lists the customer files alphabetically showing customer number, customer name, address, and salesman number.

Display:

| Cust # | ----------Customer Name---------- | ----------Address---------- | Sls # |
|---|---|---|---|
| 3145 | AMERICAN DIODE | HOUSTON, TX. | 2 |
| 3120 | AMERICAN GRAPHICS | ATLANTA, GA. | 3 |
| 3170 | AMERICAN GROUP | HOUSTON, TX. | 2 |
| 3010 | BEST CHEMICALS | HOUSTON, TX. | 2 |
| 3055 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 1 |
| 3085 | BINDER PRINTING | NEW ORLEANS, LA. | 3 |
| 3175 | COASTAL FLYER | ATLANTA, GA. | 3 |
| 3185 | CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 3 |
| 3090 | CROSSCUT SUPPLY | DALLAS, TX. | 4 |
| 3160 | DONNER PAPER CO. | ATLANTA, GA. | 3 |
| 3100 | DYNAMIC VENTURES INC. | DALLAS, TX. | 4 |
| 3070 | EASTERN SALES | DALLAS, TX. | 4 |
| 3050 | FREIGHTWAYS | NEW ORLEANS, LA. | 3 |
| 3030 | GEORGIA AMALGAMATED | ATLANTA, GA. | 3 |
| 3060 | GOLIATH | DALLAS, TX. | 4 |
| 3190 | HERCULES LIFTERS | ATLANTA, GA. | 3 |
| 3095 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 1 |
| 3005 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 1 |
| 3105 | JASPER ELECTRONICS | ATLANTA, GA. | 3 |
| 3080 | JOHN STEADY AND COMPANY | HOUSTON, TX. | 2 |
| 3180 | LEISURE SPORTS INC. | SAN ANTONIO, TX. | 1 |
| 3115 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 1 |
| 3015 | M. J. ROTH AND CO. | NEW ORLEANS, LA. | 3 |
| 3025 | MOORE WIRING | HOUSTON, TX. | 2 |
| 3140 | MUTUAL OF GEORGIA | ATLANTA, GA. | 3 |
| 3075 | NEW DIRECTION CO. | HOUSTON, TX. | 2 |
| 3155 | OCEAN TESTING | SAN ANTONIO, TX. | 1 |
| 3135 | PACER AIRWAYS | NEW ORLEANS, LA. | 3 |
| 3165 | STANDARD ENGINE | DALLAS, TX. | 4 |
| 3125 | STANDBY SUPPLY CO. | ATLANTA, GA. | 3 |
| 3040 | STATOR MACHINE WORKS | DALLAS, TX. | 4 |
| 3150 | TELEPORT INC | DALLAS, TX. | 4 |
| 3065 | THE FASTER COMPANY | ATLANTA, GA. | 3 |
| 3035 | THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 3 |
| 3045 | THE HOUSTON COMPANY | HOUSTON, TX. | 2 |
| 3110 | U.S. OFFICE FURN. | HOUSTON, TX. | 2 |
| 3130 | UNITED METALS | NEW ORLEANS, LA. | 3 |
| 3020 | WESTERN TIMBER | SAN ANTONIO, TX. | 1 |

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AQL Sentence:

SHOW cust BY-DSND YTD.SLS CUST.NO CUST.NAME ADDR YTD.SLS

Results:

Lists the customer number, customer name, address, and Year-to-Date sales from highest to lowest sales amounts (BY-DSND: By Descending Order)

Display:

| Cust# | ----------Customer Name---------- | ----------Address---------- | --YTD Sales-- |
|---|---|---|---|
| 3155 | OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| 3035 | THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 102,500.00 |
| 3110 | U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| 3070 | EASTERN SALES | DALLAS, TX. | 92,510.00 |
| 3080 | JOHN STEADY AND COMPANY | HOUSTON, TX. | 91,050.00 |
| 3075 | NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| 3160 | DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| 3125 | STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| 3175 | COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| 3065 | THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| 3180 | LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| 3045 | THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |
| 3190 | HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| 3050 | FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| 3005 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| 3030 | GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| 3040 | STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| 3095 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| 3135 | PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| 3185 | CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |
| 3170 | AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| 3140 | MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| 3165 | STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| 3060 | GOLIATH | DALLAS, TX. | 18,200.00 |
| 3020 | WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| 3115 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| 3150 | TELEPORT INC | DALLAS, TX | 14,250.00 |
| 3055 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| 3025 | MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| 3010 | BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| 3015 | M. J. ROTH AND CO. | NEW ORLEANS, LA. | 6,350.00 |
| 3105 | JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| 3085 | BINDER PRINTING | NEW ORLEANS, LA. | 6,200.00 |
| 3120 | AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| 3130 | UNITED METALS | NEW ORLEANS, LA. | 4,380.00 |
| 3145 | AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| 3090 | CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| 3100 | DYNAMIC VENTURES INC. | DALLAS, TX. | .00 |

AQL Sentence:

SHOW cust BY ADDR BY CUST.NAME CUST.NAME ADDR YTD.SLS

Results:

Lists the customer's location, name, and Year-to-Date sales grouped by locale and then listed alphabetically in that locale.

Display:

| ----------Customer Name---------- | ----------Address---------- | --YTD Sales-- |
|---|---|---|
| AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| DYNAMIC VENTURES INC. | DALLAS TX. | .00 |
| EASTERN SALES | DALLAS, TX. | 92,510.00 |
| GOLIATH | DALLAS, TX. | 18,200.00 |
| STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| TELEPORT INC | DALLAS, TX. | 14,250.00 |
| AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| JOHN STEADY AND COMPANY | HOUSTON, TX. | 91,050.00 |
| MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |
| U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| BINDER PRINTING | NEW ORLEANS, LA. | 6,200.00 |
| CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |
| FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| M. J. ROTH AND CO. | NEW ORLEANS, LA. | 6,350.00 |
| PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 102,500.00 |
| UNITED METALS | NEW ORLEANS, LA. | 4,380.00 |
| BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |

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### 3.4 SHOW FILENAME WITH

Appgen Query Language uses selection criteria to list only those portions of the complete file you want to see.

Selection criteria may be based on a range of values for any field in the record.

Operations such as 'greater than' or 'less than' a specified value may be used for selecting a record for display. The allowable operations and their meanings are:

| | | |
|---|---|---|
| GT | - | Greater Than |
| GE | - | Greater Than or Equal To |
| EQ | - | Equal To |
| NE | - | Not Equal To |
| LT | - | Less Than |
| LE | - | Less Than or Equal To |

The program takes the selection criteria you enter in the AQL sentence and compares it to the values in the file to determine what is to be in the report.

The selection value may optionally be enclosed in quote marks: e.g., 'Value' or "Value".

The punctuation marks for numeric, phone#, and dollar value fields, such as YTD.SLS, are automatically assumed and must not be entered. The value $4,800.00 must be specified as '480000'.

Appgen Query Language permits "either/or" selection for records that meet any one of several conditions, e.g., ADDRESS equals ATLANTA or HOUSTON. This selection criteria displays records from both cities.

AQL Sentence:

SHOW cust WITH YTD.SLS GE '4800000' CUST.NAME SLS.NO YTD.SLS

Results:

Displays the records of all customers with Year-To-Date sales amounts of $48,000.00 or more.

Display:

| ----------Customer Name---------- | Sls # | —YTD Sales— |
|---|---|---|
| THE HELIX CONSORTIUM | 3 | 102,500.00 |
| HERCULES LIFTERS | 3 | 53,500.00 |
| THE FASTER COMPANY | 3 | 72,780.00 |
| EASTERN SALES | 4 | 92,510.00 |
| NEW DIRECTION CO. | 2 | 84,220.00 |
| STANDBY SUPPLY CO. | 3 | 81,050.00 |
| OCEAN TESTING | 1 | 112,370.00 |
| DONNER PAPER CO. | 3 | 82,225.00 |
| COASTAL FLYER | 3 | 77,250.00 |
| LEISURE SPORTS INC. | 1 | 71,300.00 |
| JOHN STEADY AND COMPANY | 2 | 91,050.00 |
| U.S. OFFICE FURN. | 2 | 94,670.00 |
| THE HOUSTON COMPANY | 2 | 63,205.00 |

AQL Sentence:

SHOW cust WITH YTD.SLS GE '1000000' AND LE '5000000' CUST.NAME ADDR YTD.SLS

Results:

Displays the records of all customers whose Year-To-Date sales amounts are between $10,000.00 and $50,000.00 inclusive.

Display:

| ----------Customer Name---------- | ----------Address---------- | YTD Sales |
|---|---|---|
| BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| GEORGIA AMALGAMATED | ATLANTA, GA. | |
| 28,650.00 | | |
| FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| GOLIATH | DALLAS, TX. | 18,200.00 |
| HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| MUTUAL OF GEORGIA | ATLANTA, GA. | |
| 19,430.00 | | |
| TELEPORT INC | DALLAS, TX. | 14,250.00 |
| STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |

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AQL Sentence:

```
SHOW cust WITH ADDR EQ 'DALLAS, TX.' OR
'SAN ANTONIO, TX.' CUST.NO CUST.NAME ADDR YTD.SLS
```

Results:

Displays the records of all customers in either San Antonio or Dallas.

Display:

| Cust # | Customer Name | Address | YTD Sales |
|---|---|---|---|
| 3055 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| 3005 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| 3020 | WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| 3040 | STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| 3060 | GOLIATH | DALLAS, TX. | 18,200.00 |
| 3070 | EASTERN SALES | DALLAS, TX. | 92,510.00 |
| 3090 | CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| 3095 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| 3100 | DYNAMIC VENTURES INC. | DALLAS, TX. | .00 |
| 3115 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| 3150 | TELEPORT INC | DALLAS, TX. | 14,250.00 |
| 3155 | OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| 3165 | STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| 3180 | LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |

AQL Sentence:

```
SHOW cust WITH ADDR EQ 'DALLAS, TX.' AND
'SAN ANTONIO, TX.' CUST.NAME ADDR YTD.SLS
```

Results:

"selecting .... (0 records)"

Note that the AND means BOTH conditions must be met. This is an ineffective sentence since the ADDR field cannot be both Dallas and San Antonio.

AQL Sentence:

```
SHOW cust WITH ADDR EQ 'DALLAS, TX.' AND WITH YTD.SLS
GE '2000000' CUST.NAME ADDR YTD.SLS SLS.NO
```

Results:

Displays all customer records which meet BOTH conditions, i.e., in DALLAS, TX. and Year-To-Date sales amounts of $20,000.00 or more.

Display:

| Customer Name | Address | YTD Sales | Sls# |
|---|---|---|---|
| STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 | 4 |
| EASTERN SALES | DALLAS, TX. | 92,510.00 | 4 |

## 3.5 SEND THE OUTPUT TO THE PRINTER

The output display may be directed to the printer instead of the screen by adding an "Options" symbol to the Appgen Query Language Sentence. For the printer, the options symbol is: -p

If the -p option does not produce a printout on your printer, it is possible your "spooler" has been renamed. See Paragraph 6.2 for information on identifying the correct spooler name.

AQL Sentence:

> SHOW -p cust WITH YTD.SLS GE '4800000' CUST.NAME ADDR YTD.SLS

Results:

> The printer lists the customers with Year-To-Date sales amounts of $48,000.00 or more.

## 3.6 SAVING THE AQL SENTENCE

When reports are to be printed periodically, the Appgen Query Language Sentence may be saved under an "alias" name for subsequent use. This step alleviates typing mistakes and makes report generation even easier.

The options symbol for saving an Appgen Query Language Sentence is '-a' immediately followed by the alias name. The alias name may optionally be enclosed in single or double quotes.

The alias name for saving the AQL Sentence may be any name which meets the following requirements:

1. No digits or punctuation marks are permitted for the first character;
2. It must be one word; no spaces are allowed;
3. It may have punctuation marks and/or digits after the first character. Exceptions: "*", "?", "%", and "\" should not be used; they have other meanings to the operating system of the computer);
4. Maximum 14 characters.

Entry of this save option causes the AQL sentence to be saved and also displays the report.

The AQL sentence may be recalled and executed by typing in the alias' name.

Note: The output of the report is not saved, only the AQL sentence. If the data changes between executions, the report is changed.

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AQL Sentence:

```
SHOW -a 'atl.custs' cust WITH ADDR EQ 'ATLANTA, GA.'
CUST.NAME ADDR YTD.SLS
```

Results:

The AQL Sentence is saved under an alias of 'atl.custs' and may then be rerun at a later time.

Display:

| ----------Customer Name-------- | ------Address------ | YTD Sales |
|---|---|---|
| GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| COASTAL FLYER | ATLANTA, GA. | 77,250.00 |

AQL Sentence:

```
atl.custs
```

Results:

This alias name is entered in place of the AQL sentence and displays all customers in ATLANTA, GA.

Display:

| ----------Customer Name---------- | ------Address------ | YTD Sales |
|---|---|---|
| GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| COASTAL FLYER | ATLANTA, GA. | 77,250.00 |

## 3.7 RECCOUNT - COUNTING RECORDS

The "RECCOUNT" verb is used to count the number of records in the primary file which meet the specified selection criteria. The only output is a single line stating the number of records selected.

The RECCOUNT sentence consists of the verb, the filename, and optional selection criteria. See Chapter 3.4 for examples of selection criteria. Sort criteria and output criteria are ignored. The minimum RECCOUNT sentence is:

```
RECCOUNT filename
```

This prints the total number of records in the file.

AQL Sentence:

```
RECCOUNT cust WITH ADDR EQ 'ATLANTA, GA.'
```

Results:

Counts the number of customers in Atlanta, Ga.

Display:

```
9 records
```

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## 4.0 MAILING LABELS

An Appgen Query Language Sentence may be entered to select records from a file and print labels on the printer.

The printing format of the labels must be specified in the AQL Sentence in this format:

Count : number of labels across a printed page

Rows : height of each label in number of lines

Skip : number of blank lines between the labels

Indent : number of blank columns to indent from the left margin to begin the leftmost label

Size : width of each label in number of columns

Space : number of blank columns between labels

Each specified field of the record is printed on a subsequent line of the label in the sequence entered into the Appgen Query Language Sentence.

The -p option is assumed and does not need to be included.

The -a alias option may be included with the 'LABELS' AQL sentence to save the sentence for later re-execution. The -a and the alias name must immediately follow the verb 'LABELS'.

The -s option may be included to change the name of the spooler. This option follows the format specifications.

Note: No alignment messages are supplied. It is suggested that a short test list be run first to test positioning of the forms.

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AQL Sentence:

```
LABELS 3 3 2 0 20 3 cust CUST.NO CUST.NAME ADDR
```

Results:

This AQL Sentence prints three columns of labels with three lines of information on each label as shown below.

Printout:

```
                3055                    3005                    3015
BESTWAYS COMPANY        HUGHES AND DRYDEN       M. J. ROTH AND CO.
SAN ANTONIO, TX.        SAN ANTONIO, TX.        NEW ORLEANS, LA.

                3010                    3020                    3025
BEST CHEMICALS      WESTERN TIMBER              MOORE WIRING
HOUSTON, TX.            SAN ANTONIO, TX.        HOUSTON, TX.

                3030                    3050
                                                        3035
GEORGIA AMALGAMATED     FREIGHTWAYS             THE HELIX CORP.
ATLANTA, GA.                NEW ORLEANS, LA.            NEWORLEANS,
LA.

                3040                    3170                    3190
STATOR MACHINE WORKS    AMERICAN GROUP          HERCULES LIFTERS
DALLAS, TX.             HOUSTON, TX.        ATLANTA, GA.

        etc.

        etc.
```

AQL Sentence:

```
LABELS -a 'cust.labels' 3 3 2 0 20 3 cust CUST.NO CUST.NAME ADDR
```

Results:

This AQL Sentence produces the same labels as the example above and saves the sentence for later execution using the alias name 'cust.labels'.

## 5.0 AQL CONCEPTS

Appgen Query Language (AQL) retrieves and outputs information from any Appgen data base file according to criteria and specifications set up by the user in the AQL sentence. The information is located first by filename, then by the field name within the record. To use Appgen Query Language, you need to know the name of the file that has the information you want and the field names of the group of values you want to list.

In Appgen-generated applications, data is stored in the computer in groups of like information called files. Examples are the Customer Master file, the Inventory Master file, etc. Files group related sets of data into records; the related information for one customer in the Customer Master file is all in one record. The records are subdivided into fields, such as Customer Name, Address, Year-to-Date Sales, etc.

Appgen Query Language sentences are called sentences because of their similarity to a written language. Like English grammar sentences, the elements of Appgen Query Language sentences are in a predetermined and predictable sequence.

AQL sentences select, sort, and count records from Appgen application files and format, subtotal, and total the data into reports. These AQL-generated reports may also contain headings, footings, and labeling text for the sub-totaled sections and the final totals line.

To generate a report or examine the contents of a file, a sentence (AQL statement) is entered by the user. The sentence may contain as few as two elements; the verb and the name of the file to be accessed. Specifications regarding what information is to be selected and how it is to be selected and reported are added optionally to conform to your report listing requirements.

The AQL process may be thought of as a program (or processor) which accepts an AQL sentence and produces an output report on either the printer or the screen. The steps of this process are:

1. The AQL sentence initiates the operation of the AQL processor. The sentence's syntax is checked along with the correct spelling for the specified file and field names.

2. The AQL processor accesses the specified Appgen-created data file and selects some (or even all) of the records for inclusion in the final output.

3. Based on the contents of the AQL sentence, each selected record is formatted into one or more output lines for the final AQL output report.

4. The output report may be sent to your screen or the printer.

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## AQL Conventions and Definitions

The following conventions and definitions are used in the remaining sections of the manual.

All Appgen Query Language sentences end with a carriage return <CR> or <New Line> or <Enter>. Pressing <CR> turns the sentence over to Appgen Query Language for processing.

A sentence may be continued on the next line if it becomes too long. This is done by entering a space, then entering the backslash character, and pressing the <CR> key. The sentence can then be continued on the next line.

Typographical errors detected before pressing <CR> may be corrected by backspacing to the error and reentering the rest of the sentence. If you have already pressed <CR>, reenter the sentence.

Data filenames and fieldnames in the data file record layout are case sensitive, i.e., upper/lower case letters, and must be entered as they are stored in the computer; e.g., "MYFILE" cannot be entered as "Myfile" or "myfile". Only "MYFILE" is recognized.

The message "EXPRESSION ERROR" sometimes occurs after you have typed in the sentence and pressed <CR>. It means that the sentence is incorrect. When this message is displayed, check to be sure you have constructed the sentence in the proper sequence as shown in the examples. Check the filename to be sure you have called for the right file, and see that all filenames are spelled correctly and are entered with the proper case and punctuation. Appendix G contains an explanation of all Error Messages.

An "Output Report" is any output that is generated by the computer using a valid Appgen Query Language sentence. Reports are assigned to the screen display by default.

A "Hard Copy" or "Print Out" is a printed report. Printed copies are obtained by assigning the report to the printer using "-p" in the AQL sentence.

An "Element" is a part of the sentence, e.g., a filename is an element. The list of selection criteria used in the sentence is an element, the group of output criteria is considered to be another element, etc.

DEMONSTRATION DATA: A copy of the data files used to create the examples in Chapter three to seven are included in your copy of AQL (Appgen Query Language). These data files may be used in conjunction with these examples to better understand AQL.

## 5.1 BASIC ELEMENTS OF THE AQL SENTENCE

There are six major types of elements in an AQL sentence:

| Verb | Switches | Filename | Selection Criteria | Sorting Criteria | Output |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

1. VERB: There are three Appgen Verbs: 'SHOW', which displays or prints a report; 'LABELS', which produces mailing labels; and 'RECCOUNT', which counts records. The verb (upper or lower case) begins execution of the Appgen Query Language processor.

2. SWITCHES: Switches are special options used to format a report (headings, footers, length) as well as to save the Appgen Query Language sentence and direct the output to the printer.

3. FILENAME: The name of the Appgen file from which data is to be extracted. This file is known as the Primary Data File (PDF).

4. SELECTION CRITERIA: This element contains the conditions that records must meet in order to be counted or included in the report. AQL can selectively screen the records in the primary data file (PDF) based on data values in specified fields that fall within a specified range.

5. SORT CRITERIA: This element specifies how the records are to be sorted on the output listing. Sorting may be based on any field name in either ascending or descending order. Sort criteria are ignored by 'RECCOUNT'.

6. OUTPUT CRITERIA: The fields of the data record to be output are listed in this sentence element. Each field listed produces a column of data on the output report. Subtotaling and totaling for columns are also specified in this element. Output criteria are ignored by 'RECCOUNT'.

An Appgen Query Language sentence works with only the verb "SHOW" and a valid Appgen filename. Use as many of the other elements as needed to create your report; if an element is present, it must occur in the relative position in the sentence as shown.

The word "SHOW" may be entered in either all upper or all lower case letters. Filenames and fieldnames must be entered exactly as they are stored in the computer. If you do not know how to determine these names, please refer to Chapter 3.1, GETTING STARTED. The AQL sentence may contain as many elements and field names as desired.

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## 5.2 OUTPUT FORMATS

The format for AQL output reports is shown in Figure 5.1. The two important concepts illustrated are the number of output columns and the number of output lines in the body of the report. The number of output lines on a report is dependent upon two factors: the number of records from the primary data file which are selected for output and the number of multi-values which are contained in some of the data fields of these records. (See Chapter 7.7 for an example of multi-valued data fields).

There is one complete output record for each selected primary data file record. There may be a variable number of output lines associated with each output record depending upon the number of multi-values contained in certain data fields of the selected record.

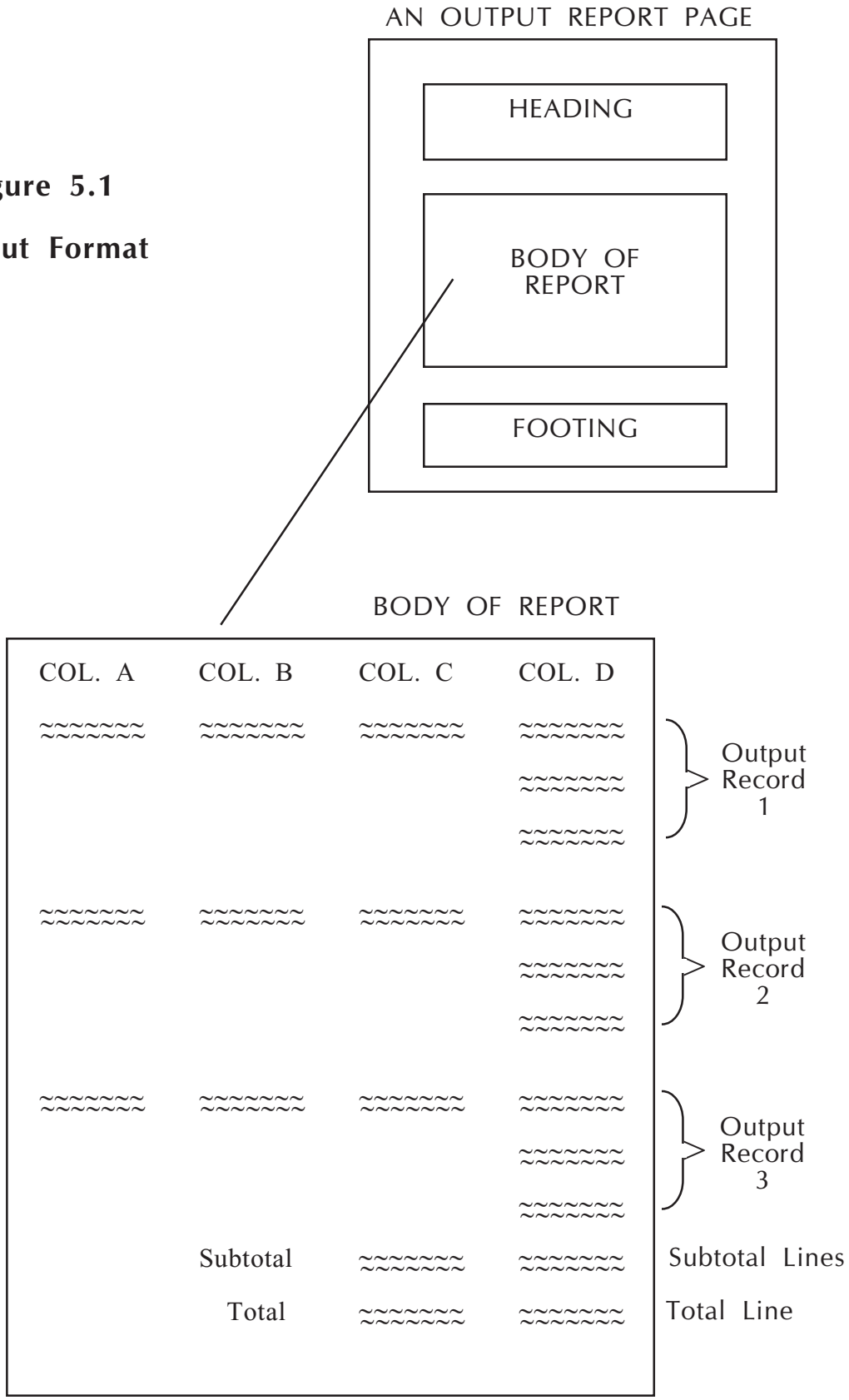
The number of columns appearing is determined by the number of fieldnames listed in the output criteria element of the AQL sentence.

Appgen Query Language output is displayed horizontally in a default format 80 columns wide. The user may specify a narrower format with a -c specification. When the width of the output display exceeds the 80 column default (or the optional user-defined column count), the program changes the output to a vertical format. An example of the vertical output format is:

```
Cust #:     3005
Customer Name:  HUGHES AND DRYDEN
Address:    SAN ANTONIO, TX.

Cust #:     3015
Customer Name:  M. J. ROTH AND CO.
Address:    NEW ORLEANS, LA.

Cust #:     3010
Customer Name:  BEST CHEMICALS
Address:    HOUSTON, TX.

Cust #:     3020
Customer Name:  WESTERN TIMBER
Address:    SAN ANTONIO, TX.

Cust #:     3025
Customer Name:  MOORE WIRING
Address:    HOUSTON, TX.

Cust #:     3030
Customer Name:  GEORGIA AMALGAMATED
Address:    ATLANTA, GA.
```

**Figure 5.1**

**Output Format**

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When the report requires more than one screen, the AQL processor fills the first screen, then stops. The bottom of the screen tells you to "Press Return To Continue, 'E' to end:". Press <CR> to display the next screen of data.

If the Output Report is directed to the printer, a default column width of 132 characters is assumed. The vertical output format does not occur until the report width exceeds 132 columns.

The output width of each column on an AQL report is predetermined and set at a fixed length for each field by the Dictionary Item for that field. Changing Dictionary Items is an advanced topic covered in Chapter Nine.

The default page length is 66 lines with automatic form feed unless a -r option is used to change the length or a -e option is used to suppress the form feed.

## 5.3 DICTIONARY ITEMS

Each Appgen-created data file has a "Dictionary File" associated with it which describes the record layout for that specific data file. The Dictionary File contains a Dictionary Item for every field in the data record identifying the field location within the data record layout and the fieldname by which that data may be accessed. Output format specifications used when printing or displaying data values from each field are also contained in the Dictionary Items.

You may access file layouts for all data files in the Appgen Applications through the Appgen Development System Quick Menu (please refer to the Appgen Development System manual). These layouts list various characteristics of the Dictionary Items including a column headed DICT NAME; this is the dictionary name of the data field. This DICT NAME is also the fieldname by which a Dictionary Item is known.

## 6.0 ELEMENTARY REPORTS

This section describes the AQL Sentence elements to use in order to create basic AQL output reports. The basic sentence which initiates the AQL process consists of an AQL verb (either 'SHOW' or 'LABELS') and a filename to be accessed. This basic sentence displays only the keys to the records in the primary data file.

Other fields of the data records may be displayed by entering their respective field names into the AQL sentence.

## 6.1 VERB AND FIELD NAMES

The verb is always the first element of the Appgen Query Language sentence. There are three AQL verbs; one to print/display data file contents, one to count records, and one to print mailing labels.

The primary verb is "SHOW". It is entered in either all upper or lower case. The purpose of this element is to call the Appgen Query Language program into service.

Another verb is "RECCOUNT". Again, it is entered in all upper or lower case. It simply counts the number of records which meet the specified selection criteria and displays that number.

The third verb is "LABELS". It is also entered in all upper or lower case. "LABELS" prints mailing labels.

A legal AQL sentence consists of a minimum of a verb and a filename. The specified filename must be an existing Appgen data file and must be entered exactly as shown by using the 'ls' (list files) command described in Chapter 3.1.

Using a filename of the format 'D.filename' lists the directory (dictionary names) of the data file. The dictionary contains the field names of all fields in that particular file record format. The report shows how the field name must be spelled in the AQL sentence to obtain the desired information from the file.

Output criteria field names must be listed in the order they are to be displayed across the output from left to right. Each output criteria field name produces a column on the output report.

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AQL Sentence:

```
SHOW cust CUST.NO CUST.NAME YTD.SLS
```

Results:

Displays all records from file 'cust' showing customer number, customer name, and year-to-date sales. The sequence of the records appears to be random but are in the natural filing sequence used by Appgen. Other fields in the records (such as salesman number and address) are not shown because their fieldnames are not included in the AQL sentence.

Display:

| Cust # | ----------Customer Name---------- | YTD Sales |
|---|---|---|
| 3055 | BESTWAYS COMPANY | 12,400.00 |
| 3005 | HUGHES AND DRYDEN | 31,450.00 |
| 3015 | M. J. ROTH AND CO. | 6,350.00 |
| 3010 | BEST CHEMICALS | 7,280.00 |
| 3020 | WESTERN TIMBER | 17,340.00 |
| 3025 | MOORE WIRING | 9,600.00 |
| 3030 | GEORGIA AMALGAMATED | 28,650.00 |
| 3050 | FREIGHTWAYS | 44,280.00 |
| 3035 | THE HELIX CONSORTIUM | 102,500.00 |
| 3040 | STATOR MACHINE WORKS | 28,500.00 |
| 3170 | AMERICAN GROUP | 21,500.00 |
| 3190 | HERCULES LIFTERS | 53,500.00 |
| 3060 | GOLIATH | 18,200.00 |
| 3065 | THE FASTER COMPANY | 72,780.00 |
| 3070 | EASTERN SALES | 92,510.00 |
| 3075 | NEW DIRECTION CO. | 84,220.00 |
| 3090 | CROSSCUT SUPPLY | 1,800.00 |
| 3085 | BINDER PRINTING | 6,200.00 |
| 3095 | HIGHLAND FREIGHT | 27,900.00 |
| 3100 | DYNAMIC VENTURES INC. | .00 |
| 3105 | JASPER ELECTRONICS | 6,310.00 |
| 3115 | LOEB INSURANCE CO. | 17,200.00 |
| 3120 | AMERICAN GRAPHICS | 4,820.00 |
| 3125 | STANDBY SUPPLY CO. | 81,050.00 |
| 3130 | UNITED METALS | 4,380.00 |
| 3145 | AMERICAN DIODE | 2,700.00 |
| 3135 | PACER AIRWAYS | 22,170.00 |
| 3140 | MUTUAL OF GEORGIA | 19,430.00 |
| 3150 | TELEPORT INC | 14,250.00 |
| 3155 | OCEAN TESTING | 112,370.00 |
| 3160 | DONNER PAPER CO. | 82,225.00 |
| 3165 | STANDARD ENGINE | 19,300.00 |
| 3175 | COASTAL FLYER | 77,250.00 |
| 3185 | CONCOURSE ENTERPRISES | 22,110.00 |
| 3180 | LEISURE SPORTS INC. | 71,300.00 |
| 3080 | JOHN STEADY AND COMPANY | 91,050.00 |
| 3110 | U.S. OFFICE FURN. | 94,670.00 |
| 3045 | THE HOUSTON COMPANY | 63,205.00 |

## 6.2 SWITCHES

Switches are used to direct the AQL output in a specific way. Some of the more basic switches are:

**-a (Alias)**

Saves the AQL sentence for later execution. An Appgen Query Language sentence can be saved and used again at a later date. To do this, give the sentence a name called an alias. The alias name can then be entered to run the report whenever it is needed again. The alias only stores the AQL sentence itself; so if the information in the file has been changed or updated, the changes are reflected in the report.

An alias name is treated like a filename by the computer. This means it can have no blank spaces in it and no characters which are reserved by the operating system.

Note: The alias option must immediately follow the AQL verb.

AQL Sentence:

```
SHOW -a 'UPDATE' cust CUST.NO CUST.NAME YTD.SLS
```

Results:

A report showing customer number, customer name, and year-to-date sales is generated whenever you enter the word UPDATE instead of the AQL Sentence.

**-p (Printer)**

The -p option in the sentence is used to send the output report to the printer. The -p option goes between the "SHOW" and the filename in the Appgen Query Language sentence.

NOTE: "-p" normally hands the report to a print spooler called "lp" which is the standard UNIX printer program. If the "-p" command does not work on your system, use -p switch followed by the -s switch as described below.

**-s (Spooler)**

The "spooler" is the printing program on your system. Its standard name, 'lp', may have been changed on your system to another name such as 'nq'. If so, use the -s switch to define the new spooler name to the AQL processor.

AQL Sentence:

```
SHOW -p -s nq cust CUST.NO CUST.NAME
```

Results:

The output report is sent to the spooler named nq for printing.

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## 6.3 SELECTION CRITERIA

Selection Criteria tests the information in each record of the data file to see if that record qualifies to be in the report you want. For example, the 'cust' file has a field called SLS.NO or salesman number. To get a report showing only the customer information for salesman number three, use selection criteria "WITH SLS.NO EQ 3".

The selection criteria element begins with the selector "WITH" or "WITHOUT" and includes a relational operator to test the value of the field.

The relational operators are:

| | |
|---|---|
| GT | Greater Than |
| GE | Greater Than or Equal To |
| EQ | Equal To |
| NE | Not Equal To |
| LT | Less Than |
| LE | Less Than or Equal To |

Multiple selection criteria may be grouped together to form complex specifications by using the logical operators "AND" and "OR".

The operator "AND" specifies that both of the two conditions it links must be met in order for the record to be selected for the output report. The operator "OR" specifies that either of the two conditions it links must be met for the record to be selected.

When evaluating combined logical operators, AQL processes the sentence twice, first to evaluate all "OR" conditions and then evaluate the "AND" conditions.

For example, the sentence:

WITH FIELD 1 EQ 'A' OR 'B' AND WITH FIELD 2 EQ 'C' OR 'D'

would be evaluated as shown below:

| RECORD | FIELD 1 | FIELD 2 | SELECTED? |
|---|---|---|---|
| 1 | A | A | NO |
| 2 | A | B | NO |
| 3 | A | C | YES |
| 4 | A | D | YES |
| 5 | B | A | NO |
| 6 | B | B | NO |
| 7 | B | C | YES |
| 8 | B | D | YES |
| 9 | C | A | NO |
| 10 | C | B | NO |
| 11 | C | C | NO |
| 12 | C | D | NO |
| 13 | D | A | NO |
| 14 | D | B | NO |
| 15 | D | C | NO |
| 16 | D | D | NO |

STRING SEARCHING. When performing selection criteria on data file records, AQL is actually accessing each record in the file and checking the data value in the specified field for acceptance. If the field is alphanumeric, AQL is searching the specified field for a string of characters which match the selection requirements.

Through the use of "wild card" characters, AQL can search for data values (strings) that partially match the selection value.

These wild card characters may be substituted to take the place of any character (?) or group of characters (*). Using "*" allows selection of information that begins or ends with a part of a string, e.g., CUST.NAME EQ 'GEORGIA*' selects all records with the customer name beginning with "GEORGIA"; e.g., GEORGIA AMALGAMATED. Using '*GEORGIA' selects all records with customer names that end with "GEORGIA"; e.g., MUTUAL OF GEORGIA.

Multiple wild card characters can be used within a sentence, such as 'WITH CUST.NAME EQ '*AM*'. This sentence selects all customers with the characters AM anywhere in the customer name.

The wild card character "?" replaces a single, unknown character. Specifying CUST.NO EQ '110?' selects all records with customer numbers 1100 through 1109. Using '11??' selects customer numbers from 1100 through 1199.

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AQL Sentence:

SHOW cust WITH ADDR EQ '*TX.' CUST.NO CUST.NAME ADDR YTD.SLS

Results:

Displays records for all customers with an address ending with 'TX.'

Display:

| Cust # | ----------Customer Name---------- | --------Address-------- | -YTD Sales- |
|---|---|---|---|
| 3055 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| 3005 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| 3010 | BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| 3020 | WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| 3025 | MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| 3040 | STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| 3170 | AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| 3060 | GOLIATH | DALLAS, TX. | 18,200.00 |
| 3070 | EASTERN SALES | DALLAS, TX. | 92,510.00 |
| 3075 | NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| 3090 | CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| 3095 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| 3100 | DYNAMIC VENTURES | DALLAS, TX. | 00.00 |
| 3115 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| 3145 | AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| 3150 | TELEPORT INC. | DALLAS, TX. | 14,250.00 |
| 3155 | OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| 3165 | STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| 3180 | LEISURES SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| 3080 | JOHN STEADY AND CO. | HOUSTON, TX. | 91,050.00 |
| 3110 | U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| 3045 | THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |

AQL Sentence:

SHOW cust WITH CUST.NAME EQ '*AM*' CUST.NO CUST.NAME

Results:

Displays all customers with the characters 'AM' in their company name.

Display:

```
Cust#       ———Customer Name———
3030        GEORGIA AMALGAMATED
3170        AMERICAN GROUP
3100        DYNAMIC VENTURES
3120        AMERICAN GRAPHICS
3145        AMERICAN DIODE
```

AQL Sentence:

RECCOUNT cust WITH CUST.NAME EQ '*AM*'

Results:

Displays the number of customers with 'AM' in their name.

Display:

```
5 records
```

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## 6.4 SORT CRITERIA

AQL can sort the Output Report listing by any field in either ascending or descending order.

Including the Sort element 'BY CUST.NAME', sorts the output records alphabetically by customer name. Using the element 'BY-DSND YTD.SLS' sorts the output records in descending order of year-to-date sales.

The ascending sort sequence priority used by AQL is: spaces, some punctuation marks, numerics (0-9), more punctuation marks, upper case alpha characters, then lower case alpha characters. This sort sequence is the standard ASCII sort sequence.

Multi-level (hierarchical) sorts may be accomplished by including more than one sorting field in the sort element, such as 'BY SLS.NO BY CUST.NAME'. AQL performs this sort giving priority from left to right. In this example, the resulting output report has the records sorted first by salesman number, then alphabetically by customer name.

AQL Sentence:

SHOW cust BY SLS.NO BY CUST.NAME SLS.NO CUST.NAME ADDR YTD.SLS

Results:

Displays the customer files sorted by salesman number, then by customer name.

Display:

| Sls # | ----------Customer Name---------- | ----------Address---------- | -YTD Sales- |
|---|---|---|---|
| 1 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| 1 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| 1 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| 1 | LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| 1 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| 1 | OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| 1 | WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| 2 | AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| 2 | AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| 2 | BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| 2 | JOHN STEADY AND COMPANY | HOUSTON, TX. | 91,050.00 |
| 2 | MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| 2 | NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| 2 | THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |
| 2 | U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| 3 | AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| 3 | BINDER PRINTING | NEW ORLEANS, LA. | 6,200.00 |
| 3 | COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| 3 | CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |
| 3 | DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| 3 | FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| 3 | GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| 3 | HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| 3 | JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| 3 | M. J. ROTH AND CO. | NEW ORLEANS, LA. | 6,350.00 |
| 3 | MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| 3 | PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| 3 | STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| 3 | THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| 3 | THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 102,500.00 |
| 3 | UNITED METALS | NEW ORLEANS, LA. | 4,380.00 |
| 4 | CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| 4 | DYNAMIC VENTURES INC. | DALLAS, TX. | .00 |
| 4 | EASTERN SALES | DALLAS, TX. | 92,510.00 |
| 4 | GOLIATH | DALLAS, TX. | 18,200.00 |
| 4 | STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| 4 | STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| 4 | TELEPORT INC | DALLAS, TX. | 14,250.00 |

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## 6.5 TOTALS

Each fieldname in the output criteria element of the AQL sentence results in a column of data on the output report. Columns may optionally be totaled at the end of the report by "modifying" the output criteria with the word 'TOTAL' placed in front of the field(s) to be totaled: 'TOTAL YTD.SLS'

AQL Sentence:

```
SHOW cust CUST.NO CUST.NAME ADDR TOTAL YTD.SLS
```

Results:

Displays all customer records and produces a grand total for the year-to-date sales column.

Display:

| Cust # | ----------Customer Name---------- | ----------Address---------- | -YTD Sales- |
|---|---|---|---|
| 3055 | BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| 3005 | HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| 3015 | M. J. ROTH AND CO. | NEW ORLEANS, LA. | 6,350.00 |
| 3010 | BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| 3020 | WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| 3025 | MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| 3030 | GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| 3050 | FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| 3035 | THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 102,500.00 |
| 3040 | STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| 3170 | AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| 3190 | HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| 3060 | GOLIATH | DALLAS, TX. | 18,200.00 |
| 3065 | THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| 3070 | EASTERN SALES | DALLAS, TX. | 92,510.00 |
| 3075 | NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| 3090 | CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| 3085 | BINDER PRINTING | NEW ORLEANS, LA. | 6,200.00 |
| 3095 | HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| 3100 | DYNAMIC VENTURES INC. | DALLAS, TX. | .00 |
| 3105 | JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| 3115 | LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| 3120 | AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| 3125 | STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| 3130 | UNITED METALS | NEW ORLEANS, LA. | 4,380.00 |
| 3145 | AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| 3135 | PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| 3140 | MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| 3150 | TELEPORT INC | DALLAS, TX. | 14,250.00 |
| 3155 | OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| 3160 | DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| 3165 | STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| 3175 | COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| 3185 | CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |
| 3180 | LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| 3080 | JOHN STEADY AND COMPANY | HOUSTON, TX. | 91,050.00 |
| 3110 | U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| 3045 | THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |
| | | | 1,472,750.00 |

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## 7.0 INTERMEDIATE REPORTS

The AQL reports discussed up to this point are typical of the ad-hoc reports needed for retrieving information from the data files on a nonrepetitive basis. There were no "cosmetics" added to these reports to identify them, other than the column headings. This section covers the AQL sentence elements needed to add labeling text to identify the report (headings/title, footers, text on subtotal and total lines). Inclusion of "current value" items such as time and date are also discussed, as is sub-totaling.

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## 7.1 USING THE "BREAK-ON" CONCEPT

AQL reports may be separated into sections by first sorting using data values of a specific field then requesting a "break" in the report whenever the data value for that field changes. For example, if the customer file 'cust' is first sorted by city (BY ADDR), breaks can be performed whenever the city changes. This results in a grouping of records on the output report by city. Breaks are produced by inserting a Break-on criteria sentence element just before the output criteria element. This Break-on element consists of the word 'BREAK-ON' followed by the fieldname. The Break-on criteria element is not part of the output criteria element. The field name associated with the break does not appear as a column on the output report unless it is repeated in the output criteria element.

If a TOTAL modifier is also included in the output criteria sentence element, breaks add vertical space to the report and also perform a sub-total at the break point for all columns being totaled.

> Note: The sub-total value(s) produced at each break is the sub-total of amounts SINCE the last break occurred, not a running sub-total from the beginning of the report.

To effect a sub-totaling, three elements are required: 1) a sort by the appropriate fieldname, 2) a 'BREAK-ON' to cause a break when the value of that field changes, and 3) a 'TOTAL' modifier which produces a grand total at the end of the report as well as a sub-total at each break point.

Note that "Break-ons" should match the sorting sequence. A report that is sorted by customer number with a break-on address (city) would probably be meaningless; a break would occur after every record or two.

To begin a new page after a break (with or without a sub-total), place a '%b0' modifier in the heading or footing text (see Chapters 7.3, 7.4, 7.6, and 7.8). If there is no heading or footing text, enter a switch element option to create one with no text; it will contain only the %b0 modifier: SHOW -h '%b0' cust....

AQL Sentence:

```
SHOW cust BY ADDR BREAK-ON ADDR CUST.NAME ADDR
```

Results:

> The customer records are sorted by city and grouped on the output report by city.

Display:

| ----------Customer Name---------- | ----------Address---------- |
|---|---|
| GEORGIA AMALGAMATED | ATLANTA, GA. |
| THE FASTER COMPANY | ATLANTA, GA. |
| JASPER ELECTRONICS | ATLANTA, GA. |
| AMERICAN GRAPHICS | ATLANTA, GA. |
| STANDBY SUPPLY CO. | ATLANTA, GA. |
| MUTUAL OF GEORGIA | ATLANTA, GA. |
| DONNER PAPER CO. | ATLANTA, GA. |
| COASTAL FLYER | ATLANTA, GA. |
| HERCULES LIFTERS | ATLANTA, GA. |
| | |
| STATOR MACHINE WORKS | DALLAS, TX. |
| GOLIATH | DALLAS, TX. |
| EASTERN SALES | DALLAS, TX. |
| CROSSCUT SUPPLY | DALLAS, TX. |
| DYNAMIC VENTURES INC. | DALLAS, TX. |
| TELEPORT INC | DALLAS, TX. |
| STANDARD ENGINE | DALLAS, TX. |
| | |
| BEST CHEMICALS | HOUSTON, TX. |
| MOORE WIRING | HOUSTON, TX. |
| THE HOUSTON COMPANY | HOUSTON, TX. |
| NEW DIRECTION CO. | HOUSTON, TX. |
| JOHN STEADY AND COMPANY | HOUSTON, TX. |
| U.S. OFFICE FURN. | HOUSTON, TX. |
| AMERICAN DIODE | HOUSTON, TX. |
| AMERICAN GROUP | HOUSTON, TX. |
| | |
| M. J. ROTH AND CO. | NEW ORLEANS, LA. |
| THE HELIX CONSORTIUM | NEW ORLEANS, LA. |
| FREIGHTWAYS | NEW ORLEANS, LA. |
| BINDER PRINTING | NEW ORLEANS, LA. |
| UNITED METALS | NEW ORLEANS, LA. |
| PACER AIRWAYS | NEW ORLEANS, LA. |
| CONCOURSE ENTERPRISES | NEW ORLEANS, LA. |
| | |
| HUGHES AND DRYDEN | SAN ANTONIO, TX. |
| WESTERN TIMBER | SAN ANTONIO, TX. |
| BESTWAYS COMPANY | SAN ANTONIO, TX. |
| HIGHLAND FREIGHT | SAN ANTONIO, TX. |
| LOEB INSURANCE CO. | SAN ANTONIO, TX. |
| OCEAN TESTING | SAN ANTONIO, TX. |
| LEISURE SPORTS INC. | SAN ANTONIO, TX. |

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AQL Sentence:

```
SHOW cust BY SLS.NO BREAK-ON SLS.NO SLS.NO CUST.NAME
TOTAL YTD.SLS
```

Results:

Displays all customer records grouped by salesman with a sub-total sales amount for each salesman and a grand total at the end.

Display:

| Sls # | ----------Customer Name---------- | YTD Sales |
|---|---|---|
| 1 | HUGHES AND DRYDEN | 31,450.00 |
| 1 | WESTERN TIMBER | 17,340.00 |
| 1 | BESTWAYS COMPANY | 12,400.00 |
| 1 | HIGHLAND FREIGHT | 27,900.00 |
| 1 | LOEB INSURANCE CO. | 17,200.00 |
| 1 | OCEAN TESTING | 112,370.00 |
| 1 | LEISURE SPORTS INC. | 71,300.00 |
| | | 289,960.00 |
| 2 | BEST CHEMICALS | 7,280.00 |
| 2 | MOORE WIRING | 9,600.00 |
| 2 | THE HOUSTON COMPANY | 63,205.00 |
| 2 | NEW DIRECTION CO. | 84,220.00 |
| 2 | JOHN STEADY AND COMPANY | 91,050.00 |
| 2 | U.S. OFFICE FURN. | 94,670.00 |
| 2 | AMERICAN DIODE | 2,700.00 |
| 2 | AMERICAN GROUP | 21,500.00 |
| | | 374,225.00 |
| 3 | M. J. ROTH AND CO. | 6,350.00 |
| 3 | GEORGIA AMALGAMATED | 28,650.00 |
| 3 | THE HELIX CONSORTIUM | 102,500.00 |
| 3 | FREIGHTWAYS | 44,280.00 |
| 3 | THE FASTER COMPANY | 72,780.00 |
| 3 | BINDER PRINTING | 6,200.00 |
| 3 | JASPER ELECTRONICS | 6,310.00 |
| 3 | AMERICAN GRAPHICS | 4,820.00 |
| 3 | STANDBY SUPPLY CO. | 81,050.00 |
| 3 | UNITED METALS | 4,380.00 |
| 3 | PACER AIRWAYS | 22,170.00 |
| 3 | MUTUAL OF GEORGIA | 19,430.00 |
| 3 | DONNER PAPER CO. | 82,225.00 |
| 3 | COASTAL FLYER | 77,250.00 |
| 3 | CONCOURSE ENTERPRISES | 22,110.00 |
| 3 | HERCULES LIFTERS | 53,500.00 |
| | | 634,005.00 |
| 4 | STATOR MACHINE WORKS | 28,500.00 |
| 4 | GOLIATH | 18,200.00 |
| 4 | EASTERN SALES | 92,510.00 |
| 4 | CROSSCUT SUPPLY | 1,800.00 |
| 4 | DYNAMIC VENTURES INC. | .00 |
| 4 | TELEPORT INC | 14,250.00 |
| 4 | STANDARD ENGINE | 19,300.00 |
| | | 174,560.00 |
| | | 1,472,750.00 |

## 7.2 REPORT SIZING

The output page size of an AQL report (number of columns and number of lines/rows) can be specified by inserting sizing options between the AQL sentence verb element and the filename element.

The -c'n' sizing option sets the report at 'n' columns wide. Note: -c'n' options with small values of 'n' force reports into the vertical format.

A sizing option of -r'n' sets the length of the report (including headings, footings, sub-totals, and totals) to a total length of 'n' row or lines per page.

Continuous forms printing without page ejects between pages may be performed using the -e option. The -r'n' option is not used with the -e option.

The -r, the -c, and the -e options follow the -p option (if present) and are separated from it and from each other by a blank space.

AQL Sentence:

```
SHOW -p -r16 -c40 cust CUST.NO CUST.NAME ADDR
```

Results:

Displays the customer records on a page 40 columns wide and 16 rows long. Note: This narrow page width forces the output into the vertical format.

Report:

```
Cust #:          3055
Customer  Name:  BESTWAYS COMPANY
Address:         SAN ANTONIO, TX.

Cust #:          3005
Customer  Name:  HUGHES AND DRYDEN
Address:         SAN ANTONIO, TX.

Cust #:          3015
Customer  Name:  M. J. ROTH AND CO.
Address:         NEW ORLEANS, LA.

Cust #:          3010
Customer  Name:  BEST CHEMICALS
Address:         HOUSTON, TX.

Cust #:          3020
Customer  Name:  WESTERN TIMBER
Address:         SAN ANTONIO, TX.
```

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## 7.3 GENERATING HEADINGS

The -h heading option puts descriptive line(s) of text at the top of the AQL report. For example, to put the title "FIRST QUARTER SALES" on the top of the report, use the option:

-h 'FIRST QUARTER SALES'

Note: The actual text to be used must be enclosed in a set of quote marks. The heading text starts in column one of the output report. The heading text may be started in another column by using the %c'n' modifier within the text line inside of the quote marks to begin the heading in column 'n'.

Multiple line headings may also be specified by entering the -h option more than once.

The current page number may be included in the heading text by using the %p'n' item (where 'n' is the field width of the page number value). The page number appears right justified in a field of 'n' blanks.

Use a %b0 in a heading to perform a pagefeed whenever a break occurs. This capability allows starting a new page after each subtotal.

The -h option is located in the AQL Switches element between the verb and filename. It should follow the -a option, if present.

The current date may be included in a heading by using the %t item. Its display column is determined by its position in the heading text.

See Chapters 7.6 and 7.8 for more information on headings.

AQL Sentence:

```
SHOW -h '%c20 FIRST QUARTER SALES' -h '%c21 Atlanta
Ga. Only' cust WITH ADDR EQ 'ATLANTA, GA.' CUST.NO
CUST.NAME ADDR TOTAL YTD.SLS
```

Results:

Adds a two line title for the First Quarter sales report for Atlanta, Georgia.

Display:

FIRST QUARTER SALES
Atlanta, Ga. Only

| Cust # | ------Customer Name------ | ------Address------ | —YTD Sales— |
|---|---|---|---|
| 3030 | GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| 3190 | HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| 3065 | THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| 3105 | JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| 3120 | AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| 3125 | STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| 3140 | MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| 3160 | DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| 3175 | COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| | | | 426,015.00 |

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## 7.4 GENERATING FOOTINGS

The -f footing options puts descriptive text at the bottom of an AQL report. Multi-line footers may be created by using the -f option more than once.

The format for the -f option is -f 'footing text' where the footing text string to be displayed/printed is enclosed in a set of quote marks. (Either double or single quote marks must be entered.)

The current page number may be included in the footing text by using the %p'n' item (where 'n' is the field width of the page number value). The page number appears right justified in a field of 'n' blanks.

Use a %b0 in a footing to perform a pagefeed whenever a break occurs. This capability allows starting a new page after each subtotal.

The current date may be included in a footing by using the %d item. The date appears in a column as determined by its position in the footing text.

The current time and date may be included in a footing by using the %t item. Its display column is determined by its position in the footing text.

Note: All text for headings and footings are left justified, beginning in column 'n'. The %c'n' modifier must be placed inside the quote marks which indicate the text. The %c'n' modifier may be used several times within a text string. In each instance, the text immediately following it begins in the specified column 'n'.

See Chapters 7.6 and 7.8 for more information on footings.

AQL Sentence:

```
SHOW -f '%c20 SALES REPORT' -f'%c23 page %p' cust WITH
ADDR EQ 'ATLANTA, GA.' CUST.NO CUST.NAME ADDR
TOTAL YTD.SLS
```

Results:

Displays a sales report with a two line footing centered and including the page number.

Display:

| Cust # | ----------Customer Name---------- | ------Address------ | -YTD Sales- |
|---|---|---|---|
| 3030 | GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| 3190 | HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |
| 3065 | THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| 3105 | JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| 3120 | AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| 3125 | STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| 3140 | MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| 3160 | DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| 3175 | COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| | | | 426,015.00 |

SALES REPORT
page 1

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## 7.5 REPORT LABELING TEXT

Report labeling text is a short text string that may be inserted on breaks, sub-total, and total lines to add more clarity to output reports.

The actual text to be displayed/printed must be enclosed in quotes and must be located between the BREAK-ON or TOTAL modifier and its associated fieldname. The labeling text appears left-justified beginning in column one of the sub-total or total line unless the %c'n' modifier is used to begin the text in column 'n'. The %c'n' modifier must be inside of the quote marks which indicate the labeling text string.

To place labeling text on both sides of the sub-total or total data value, the %c'n' modifier may be used in the labeling text more than once.

The current break value, i.e., the current value of the field that caused the break, is available for inclusion in the BREAK-ON text string by using the modifier %b at the desired point in the labeling text string. To limit the width of the current break value to a field of "n" characters, use the %b'n' form of this modifier. The break value is justified in a field of 'n' blanks; the justification (left or right) is implied by the format of the field causing the break.

Do not use %b modifiers in TOTAL text strings.

AQL Sentence:

```
SHOW cust BY SLS.NO BREAK-ON '%c2 subtotal for slsman
#: %b' SLS.NO SLS.NO CUST.NAME TOTAL '%c20 Total %c47
GRAND TOTAL' YTD.SLS
```

Display:

| Sls # | ———Customer Name——— | —YTD Sales— |
|---|---|---|
| 1 | HUGHES AND DRYDEN | 31,450.00 |
| 1 | WESTERN TIMBER | 17,340.00 |
| 1 | BESTWAYS COMPANY | 12,400.00 |
| 1 | HIGHLAND FREIGHT | 27,900.00 |
| 1 | LOEB INSURANCE CO. | 17,200.00 |
| 1 | OCEAN TESTING | 112,370.00 |
| 1 | LEISURE SPORTS INC. | 71,300.00 |
| | subtotal for slsman #: 1 | 289,960.00 |
| 2 | BEST CHEMICALS | 7,280.00 |
| 2 | MOORE WIRING | 9,600.00 |
| 2 | THE HOUSTON COMPANY | 63,205.00 |
| 2 | NEW DIRECTION CO. | 84,220.00 |
| 2 | JOHN STEADY AND COMPANY | 91,050.00 |
| 2 | U.S. OFFICE FURN. | 94,670.00 |
| 2 | AMERICAN DIODE | 2,700.00 |
| 2 | AMERICAN GROUP | 21,500.00 |
| | subtotal for slsman #: 2 | 374,225.00 |
| 3 | M. J. ROTH AND CO. | 6,350.00 |
| 3 | GEORGIA AMALGAMATED | 28,650.00 |
| 3 | THE HELIX CONSORTIUM | 102,500.00 |
| 3 | FREIGHTWAYS | 44,280.00 |
| 3 | THE FASTER COMPANY | 72,780.00 |
| 3 | BINDER PRINTING | 6,200.00 |
| 3 | JASPER ELECTRONICS | 6,310.00 |
| 3 | AMERICAN GRAPHICS | 4,820.00 |
| 3 | STANDBY SUPPLY CO. | 81,050.00 |
| 3 | UNITED METALS | 4,380.00 |
| 3 | PACER AIRWAYS | 22,170.00 |
| 3 | MUTUAL OF GEORGIA | 19,430.00 |
| 3 | DONNER PAPER CO. | 82,225.00 |
| 3 | COASTAL FLYER | 77,250.00 |
| 3 | CONCOURSE ENTERPRISES | 22,110.00 |
| 3 | HERCULES LIFTERS | 53,500.00 |
| | subtotal for slsman #: 3 | 634,005.00 |
| 4 | STATOR MACHINE WORKS | 28,500.00 |
| 4 | GOLIATH | 18,200.00 |
| 4 | EASTERN SALES | 92,510.00 |
| 4 | CROSSCUT SUPPLY | 1,800.00 |
| 4 | DYNAMIC VENTURES INC. | .00 |
| 4 | TELEPORT INC | 14,250.00 |
| 4 | STANDARD ENGINE | 19,300.00 |
| | subtotal for slsman #: 4 | 174,560.00 |
| | Total | 1,472,750.00 |

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## 7.6 IMBEDDED CURRENT VALUES

The current values of system variables (time, date, etc.) may be placed within the labeling text of headings, footings, and break and total lines using the imbedded current value modifiers. These modifiers begin with a % (percent sign) and may be placed anywhere within the text string. The % should be preceded by a space to set it off from literal labeling text.

The various imbedded current values that may be called for inclusion in a labeling text string are:

| | |
|---|---|
| %d | Prints the current date in 'mmm dd, yyyy' form. (e.g., Apr 26, 1984) |
| %t | Prints the time AND date in 'hh:mm:ss mmm dd, yyyy' form. (e.g., 12:00:00 Apr 26, 1984) |
| %f<n> | Prints the filename of the primary data file being used by AQL. If the integer 'n' is specified, the name is left justified in a field of 'n' blanks. |
| %p<n> | Prints the page number. If the integer 'n' is specified, the page number is right justified in a field of 'n' blanks. |
| %b<n> | Prints the control break value. If 'n' is not specified, the break value is printed as is. If 'n' is specified, the break value is left or right justified (implied by its field format) in a field of 'n' blanks. If multiple %bs are specified in heading or footing lines, the first %b applies to the first break level, the second to the second break level, and so on.<br><br>Imbedding a %b0 modifier (n=0) in a heading or footing text line forces a pagefeed each time a break occurs. If multiple %b0s are specified, the first %b0 applies to the first break level, the second to the second break level, and so on. %b0 does not print a break value.<br><br>Multiple %b modifiers imbedded in BREAK-ON label text strings only repeat the value of the field specified in that BREAK-ON element. They do not print the value of other break levels as in heading and footing lines.<br><br>See Chapter 7.8 for more information on multiple break levels and subtotals.<br><br>%b modifiers must not be imbedded in TOTAL text label strings. |

AQL Sentence:

```
SHOW -h '%c15 FIRST QUARTER SALES %c40 %t' -h '%c16 Atlanta
Ga. Only  %c40 Filename:  %f' -h '%c18 %d' cust WITH ADDR EQ
'ATLANTA, GA.' CUST.NO CUST.NAME ADDR TOTAL YTD.SLS
```

Results:

Prints a report with the current date and time, the filename from which the data was drawn, and the date centered under the title.

Display:

```
FIRST QUARTER SALES                07:59:39 Apr 1, 1991
Atlanta Ga. Only                   Filename: cust
  Apr 1, 1991

Cust #      ---———Customer Name---———      ———Address———   —YTD Sales—
3030        GEORGIA AMALGAMATED            ATLANTA, GA.          28,650.00
3190        HERCULES LIFTERS               ATLANTA, GA.          53,500.00
3065        THE FASTER COMPANY             ATLANTA, GA.          72,780.00
3105        JASPER ELECTRONICS             ATLANTA, GA.           6,310.00
3120        AMERICAN GRAPHICS              ATLANTA, GA.           4,820.00
3125        STANDBY SUPPLY CO.             ATLANTA, GA.          81,050.00
3140        MUTUAL OF GEORGIA              ATLANTA, GA.          19,430.00
3160        DONNER PAPER CO.               ATLANTA, GA.          82,225.00
3175        COASTAL FLYER                  ATLANTA, GA.          77,250.00
                                                                 426,015.00
```

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## 7.7 MULTI-VALUED DATA FIELDS

The Appgen file structure is organized as a relational data base in that it supports multi-valued fields where the multiple data values are separated by a special delimiting character. In a relational data base, a data value not only has meaning because of the field in which it occurs, but also by its position in the field if the field is multi-valued.

As an example, two multi-valued data fields are included in the demonstration file 'cust' included with your copy of AQL. The total year-to-date sales for a customer is contained in the YTD.SLS field; a further breakdown of sales by month is contained in the multi-valued field MON.SLS. Each value of the set of multi-values in this one field contains the amount of sales for a specific month. The corresponding month in which the sales actually occurred is kept in a separate (and related!) multi-valued field named MON. The first value in field MON relates to the first value in field MON.SLS, the second to the second, etc.

The multi-values of a multi-valued field are listed on AQL displays/printouts in the column associated with that fieldname; each value is placed on a successive line, one below the other. The number of lines in an output report record is dependent on the number of values in any multi-valued field being displayed.

AQL Sentence:

```
SHOW cust WITH CUST.NAME LT 'C' BREAK-ON CUST.NO
CUST.NAME YTD.SLS MON TOTAL MON.SLS
```

Results:

Displays the multi-valued fields of monthly sales and the month in which the sales occurred.

Display:

| ———Customer Name——— | —YTD Sales— | Month | Monthly Sales |
|---|---|---|---|
| BESTWAYS COMPANY | 12,400.00 | JAN | 3,000.00 |
| | | FEB | 4,400.00 |
| | | MAR | 5,000.00 |
| | | | 12,400.00 |
| BEST CHEMICALS | 7,280.00 | JAN | 2,280.00 |
| | | FEB | 3,000.00 |
| | | MAR | 2,000.00 |
| | | | 7,280.00 |
| AMERICAN GROUP | 21,500.00 | JAN | 7,000.00 |
| | | FEB | 7,750.00 |
| | | MAR | 6,750.00 |
| | | | 21,500.00 |
| BINDER PRINTING | 6,200.00 | JAN | 2,100.00 |
| | | FEB | 2,050.00 |
| | | MAR | 2,050.00 |
| | | | 6,200.00 |
| AMERICAN GRAPHICS | 4,820.00 | JAN | 1,410.00 |
| | | MAR | 1,410.00 |
| | | MAR | 2,000.00 |
| | | | 4,820.00 |
| AMERICAN DIODE | 2,700.00 | JAN | 900.00 |
| | | FEB | 900.00 |
| | | MAR | 900.00 |
| | | | 2,700.00 |
| | | | 54,900.00 |

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## 7.8 MULTI-LEVEL SUB-TOTALING

Multiple levels of sub-totaling are specified in a report by having multiple levels of sorting, multiple "BREAK-ONs", and at least one column which is TOTALed. As an example, consider the situation where a salesman is assigned a large territory. The customer records may be sorted first by salesman, then alphabetically by address. This sorting sequence creates a grouping first by salesman, then by address within the territory assigned to the salesman. A sub-total is generated for each city associated with a given salesman. Then, for each salesman, a sub-total including all his cities is produced. Finally, a grand total, including all salesmen, is generated. This is illustrated in the report on the following pages. Notice that salesman three has two cities, Atlanta and New Orleans. A sub-total is generated for each city, then a total for the salesman which is the sum of his two cities.

Totals and sub-totals are automatically nested. At the end of the report, the grand total (referred to as break level 0) automatically triggers sub-totals for all higher numbered break levels. In our example, the grand total is preceded by the sub-total for the last salesman (break level 1) which is preceded by the sub-total for that salesman's last city (break level 2).

Multiple break values can be printed in heading and footing label lines using the %b modifier. The first %b in a line prints the value of break level 1. The second %b in a line prints the value of break level 2, etc. You cannot print the value of any break level without reference to all those with a lower break level number. To print the value of break level two, you must have two %b modifiers in the heading or footing line.

%b0 modifiers in heading and footing lines are handled similarly. The first %b0 on a line causes a page feed when the value of break level one changes. The second %b0 causes a page feed when the value of break level two changes, etc. You cannot get a page feed for break level two without getting one for break level one. If any heading or footing line contains a %b0, a page feed will be performed before the grand total is printed. %b0 is ignored in BREAK-ON label text.

The value printed for any %b0 is the current value of the field producing the break. That value can change within the body of a page. The value printed for a particular break level in the heading of a page can be different from the value printed for the same break level in the footing.

AQL Sentence:

```
SHOW cust BY SLS.NO BY ADDR BREAK-ON "%c27 SALESMAN %b
SUBTOTAL" SLS.NO BREAK-ON "%c23 CITY %b SUBTOTAL" ADDR
SLS.NO ADDR CUST.NAME TOTAL YTD.SLS
```

Results:

Produces a sales report showing a sub-total of sales for each city and a sub-total for each salesman.

Display:

| Sls # | ———Address——— | ———Customer Name——— | —YTD Sales— |
|---|---|---|---|
| 1 | SAN ANTONIO, TX. | HUGHES AND DRYDEN | 31,450.00 |
| 1 | SAN ANTONIO, TX. | WESTERN TIMBER | 17,340.00 |
| 1 | SAN ANTONIO, TX. | BESTWAYS COMPANY | 12,400.00 |
| 1 | SAN ANTONIO, TX. | HIGHLAND FREIGHT | 27,900.00 |
| 1 | SAN ANTONIO, TX. | LOEB INSURANCE CO. | 17,200.00 |
| 1 | SAN ANTONIO, TX. | OCEAN TESTING | 112,370.00 |
| 1 | SAN ANTONIO, TX. | LEISURE SPORTS INC. | 71,300.00 |
| | | CITY SAN ANTONIO, TX. SUBTOTAL | 289,960.00 |
| | | SALESMAN 1 SUBTOTAL | 289,960.00 |
| 2 | HOUSTON, TX. | BEST CHEMICALS | 7,280.00 |
| 2 | HOUSTON, TX. | MOORE WIRING | 9,600.00 |
| 2 | HOUSTON, TX. | THE HOUSTON COMPANY | 63,205.00 |
| 2 | HOUSTON, TX. | NEW DIRECTION CO. | 84,220.00 |
| 2 | HOUSTON, TX. | JOHN STEADY AND COMPANY | 91,050.00 |
| 2 | HOUSTON, TX. | U.S. OFFICE FURN. | 94,670.00 |
| 2 | HOUSTON, TX. | AMERICAN DIODE | 2,700.00 |
| 2 | HOUSTON, TX. | AMERICAN GROUP | 21,500.00 |
| | | CITY HOUSTON, TX. SUBTOTAL | 374,225.00 |
| | | SALESMAN 2 SUBTOTAL | 374,225.00 |
| 3 | ATLANTA, GA. | GEORGIA AMALGAMATED | 28,650.00 |
| 3 | ATLANTA, GA. | THE FASTER COMPANY | 72,780.00 |
| 3 | ATLANTA, GA. | JASPER ELECTRONICS | 6,310.00 |
| 3 | ATLANTA, GA. | AMERICAN GRAPHICS | 4,820.00 |
| 3 | ATLANTA, GA. | STANDBY SUPPLY CO. | 81,050.00 |
| 3 | ATLANTA, GA. | MUTUAL OF GEORGIA | 19,430.00 |
| 3 | ATLANTA, GA. | DONNER PAPER CO. | 82,225.00 |
| 3 | ATLANTA, GA. | COASTAL FLYER | 77,250.00 |
| 3 | ATLANTA, GA. | HERCULES LIFTERS | 53,500.00 |
| | | CITY ATLANTA, GA. SUBTOTAL | 426,015.00 |
| 3 | NEW ORLEANS, LA. | M. J. ROTH AND CO. | 6,350.00 |
| 3 | NEW ORLEANS, LA. | THE HELIX CONSORTIUM | 102,500.00 |
| 3 | NEW ORLEANS, LA. | FREIGHTWAYS | 44,280.00 |
| 3 | NEW ORLEANS, LA. | BINDER PRINTING | 6,200.00 |
| 3 | NEW ORLEANS, LA. | UNITED METALS | 4,380.00 |
| 3 | NEW ORLEANS, LA. | PACER AIRWAYS | 22,170.00 |
| 3 | NEW ORLEANS, LA. | CONCOURSE ENTERPRISES | 22,110.00 |
| | | CITY NEW ORLEANS, LA. SUBTOTAL | 207,990.00 |
| | | SALESMAN 3 SUBTOTAL | 634,005.00 |
| 4 | DALLAS, TX. | STATOR MACHINE WORKS | 28,500.00 |
| 4 | DALLAS, TX. | GOLIATH | 18,200.00 |
| 4 | DALLAS, TX. | EASTERN SALES | 92,510.00 |
| 4 | DALLAS, TX. | CROSSCUT SUPPLY | 1,800.00 |
| 4 | DALLAS, TX. | DYNAMIC VENTURES INC. | .00 |
| 4 | DALLAS, TX. | TELEPORT INC | 14,250.00 |
| 4 | DALLAS, TX. | STANDARD ENGINE | 19,300.00 |
| | | CITY DALLAS, TX. SUBTOTAL | 174,560.00 |
| | | SALESMAN 4 SUBTOTAL | 174,560.00 |
| | | | 1,472,750.00 |

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## 8.0 ADVANCED AQL REPORTS

The previous sections of this manual have covered the fundamentals of extracting and displaying explicit information from the data base; every data value displayed actually exists in the data base. However, implicit information is also contained in data bases, i.e., the data is implied by the actual data values in the data records but is not there in a directly extractable form. An example of implicit information would be an inventory part record that contained a QUANTITY-ON-HAND field and an AVERAGE-COST-PER-ITEM field, but no COST-OF-INVENTORY field. The COST-OF-INVENTORY field is implied; it is the product of the other two fields. (Cost = Qty x Avg. Cost).

Advanced AQL users can create AQL reports which access explicit data values and perform calculations to produce implicit data values. The AQL process uses parameters contained in the Dictionary Items to access data values and format them for output. Figure 8.0.a illustrates this process. The Dictionary Items have two sets of parameters for performing two major tasks: 1) obtaining a data value, either explicitly or implicitly, and 2) formatting and displaying that value on an AQL output report. Figure 8.0.b illustrates how the Dictionary Maintenance capabilities of AQL can be used to add new Dictionary Items to an existing data base.

It is through the addition of new Dictionary Items (and using them with an appropriate AQL sentence) that advanced users can produce powerful reports that extract both explicit and implicit information.

## 8.1 HOW TO USE THE ADVANCED SECTION

This portion of the AQL manual is a combination tutorial and reference guide. It is written based on the assumption that you have completely understood the basic capabilities of AQL as presented in the preceding Chapters 3 through 7. Chapter 9.0 presents underlying AQL concepts which should be studied and understood prior to using the reference information in Chapters 10, 11, and 12.

## 8.2 DATA BASE INTEGRITY

The AQL process only performs read operations on records in the data base and does not affect the integrity of the data files (which are created and used by Appgen Applications). The APPGEN Applications also use some of the Dictionary Item parameters when accessing data files; again, to preserve the data base integrity, the AQL Dictionary Maintenance process cannot change any Dictionary Item parameters created by Appgen.

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## 9.0 ADVANCED AQL CONCEPTS

This chapter covers AQL concepts that need to be understood in order to plan and construct new Dictionary Items to be used in creating customized AQL reports. This chapter is tutorial in nature; examples of the various Dictionary Items are found in Chapter 11.

## 9.1 APPGEN FILE STRUCTURE

Appgen data files contain data in a dynamic format. Each record changes in size as data is added to or deleted from it. Fields are variable in length and can be subdivided with special delimiters, creating any number of variable-length "values".

Thus, the Appgen File system contains on-line:

- any number of files, which contain:
- any number of records, which contain:
- multiple fields, which may contain:
- multiple values.

Note: Within the Appgen file structure fields are called "attributes". To stay consistent with Appgen, the words 'attribute' and 'field' should be considered interchangeable.

Figure 9.1 shows the basic relationship between a record and its single-valued and multi-valued attributes. Attributes are numbered sequentially within a record and are all present even if the value of the attribute is null.

The number of values contained in a multi-valued (MV) attribute varies from record to record depending upon the data contained in the record. There are two types of multi-valued attributes: controlling (CMV) and dependent (DMV). A CMV attribute may have as many values as required. The number of values will vary from record to record. DMV attributes are associated with a CMV attribute and will have the same number of values as the CMV attribute. When the number of MV's in the CMV is changed, the number of MV's in each of the dependent multi-valued attributes is also changed.

The key of a data file record is contained in attribute 0 of the data record layout and must not be multi-valued. To create a multi-part key (such as the customer number concatenated with an invoice number), a delimiter (the character "*") is used to separate the two parts of the key. The first part may be accessed by a Dictionary Item with attribute 0, value 1, separator "*". The second part of the key is accessed by a Dictionary Item with attribute 0, value 2, separator "*". See Figure 9.2.

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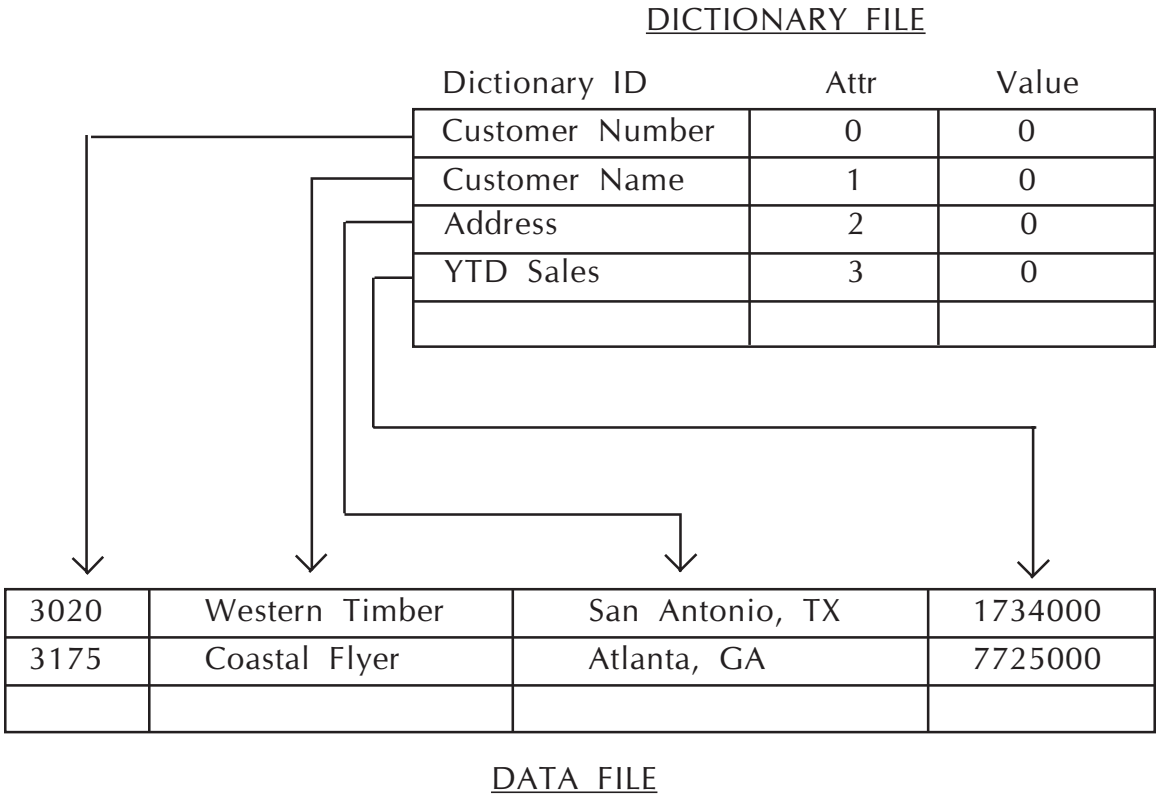


**Figure 9.3**

**Dictionary & Data Files**

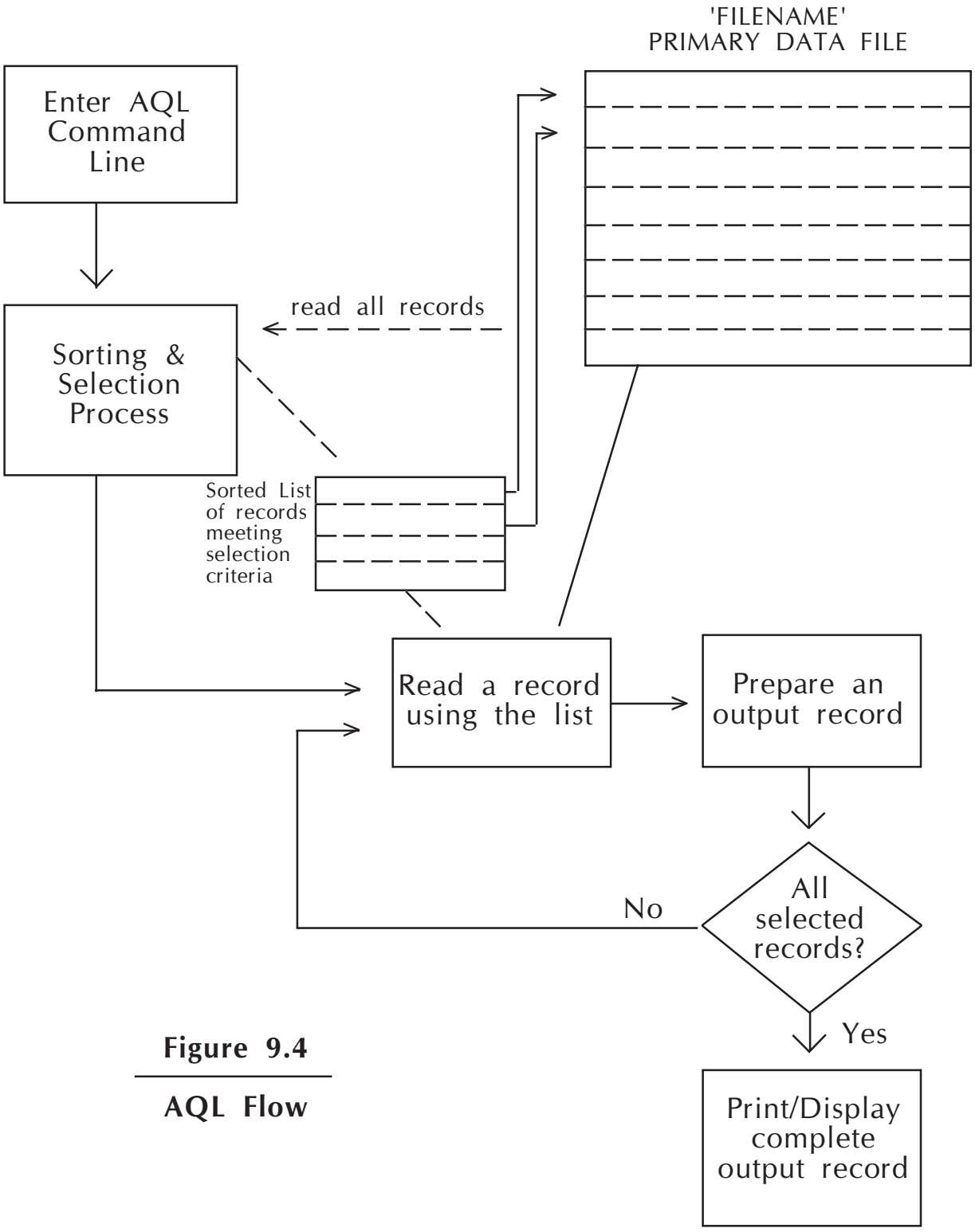


**Figure 9.4**

**AQL Flow**

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## 9.2 THE AQL PROCESS

Figure 9.4 represents the overall flow of the process of producing an AQL output report. The AQL process is initiated by entry of an AQL sentence containing a filename to be accessed and various fieldnames to be printed/displayed on the AQL output report. The AQL sentence may limit the total number of records to be read through use of the selection criteria element. The file accessed by the AQL sentence is called the Primary Data File (PDF); the records selected from the PDF for processing are called the selected PDF records; the sort/selection process performed by AQL saves the keys of these records in a list.

AQL reads the selected PDF records one at a time and produces one output record on the output report for each selected PDF record. When all selected records have been processed, AQL prints/displays the completed AQL report.

## 9.3 "CURRENT RECORD" CONCEPT

During the processing of each selected record, the AQL processor sequentially accesses the Dictionary Items listed in the AQL sentence to prepare the data values to be displayed/printed in each column of the output report. In obtaining data values from a record in the Primary Data File (PDF), AQL is not actually reading the values from the data itself; the data record currently being processed has been copied into a temporary storage location called the "Primary Buffer". Figure 9.5 is an illustration of this process.

When a Dictionary Item parameter points to a field in the PDF record, the actual data value extracted comes from the Primary Buffer rather than directly from the data file itself. Each time a new record from the PDF is processed, the Primary Buffer is overwritten with the new record information.

This "current record" concept is important to understanding the operation of AQL in that the data record is copied into the Primary Buffer and operated on by AQL. In the process some of the data values in the Primary Buffer may be changed by AQL (based on parameters in the Dictionary Item being used).

There also exists a corresponding Secondary Buffer where a record from a secondary data file can be loaded and operated on by AQL in the same manner.

Data is loaded into the Secondary Buffer only by Dictionary Items which specify a secondary file access. If the AQL sentence being performed lists more than one Dictionary Item which specifies a secondary file access, the Secondary Buffer is reloaded by each of these Dictionary Items in the order listed in the AQL sentence.

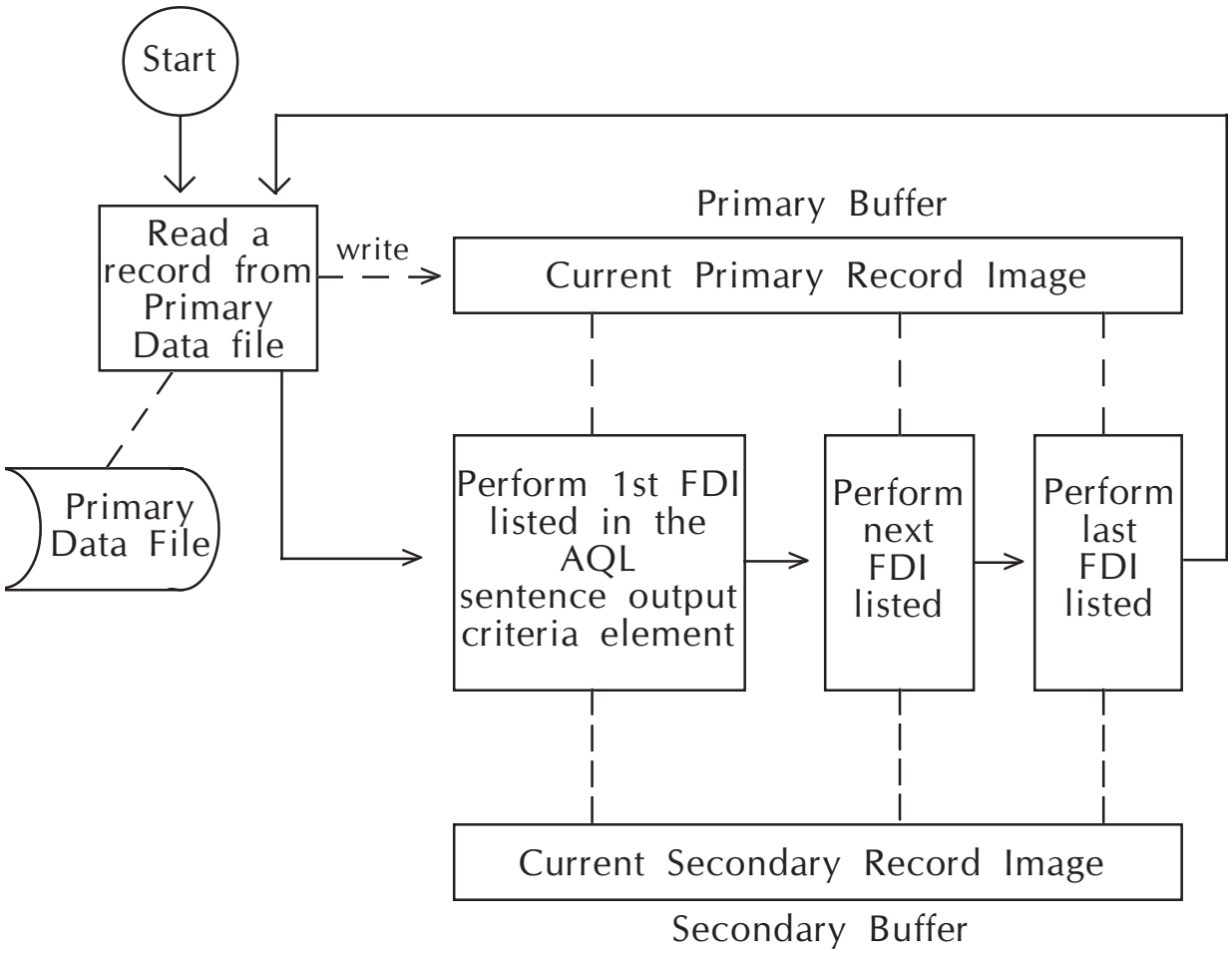


**Figure 9.5**

**"Current Record" Concept**

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## 9.4 ROLE OF DICTIONARY ITEMS IN THE AQL PROCESS

The AQL processor uses the Dictionary Items listed in the AQL sentence to get parameters from the Dictionary Items for use in the AQL process. These Dictionary Item parameters specify two major tasks: 1) obtaining the data value to be output, and 2) performing conversion of the data value to a text string for printing/displaying.

Data values are obtained in one of three ways:

1. Explicitly from a field in the Primary Buffer;

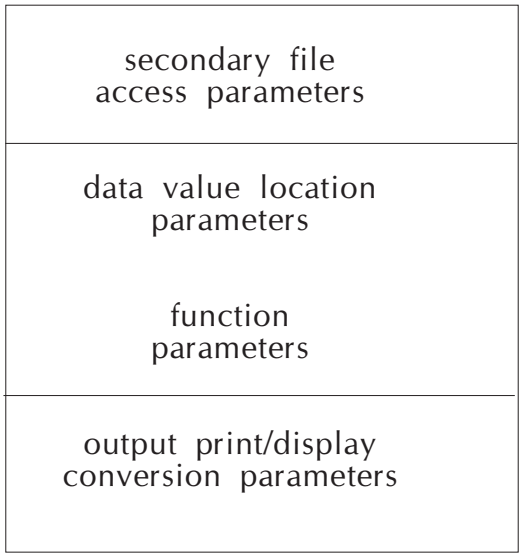
2. Explicitly from a field in a record from an associated secondary file; the Dictionary Item contains parameters to open the secondary file, form the key to the desired record, and read the record into the Secondary Buffer;

3. Implicitly through a function parameter contained in the referenced Dictionary Item.

Once the final data value is obtained, AQL looks to the Dictionary Item for parameters to use in printing/displaying the data value (print field width, justification, etc.).

## 9.5 DICTIONARY ITEM CONTENTS

Up to four different sets of parameters are found in Dictionary Items as shown below:



The secondary file parameters tell AQL which secondary data file to open and the key to the record to be read. The key may be an explicit data value read from the Primary Buffer, or it may be a function that is calculated using data value(s) in the Primary Buffer. The data value location parameters specify the attribute number and value number (if multi-valued) from which to extract the data value for display/printing. If the data field contains a separator (like the "*" in multi-part data record keys) it, too, is specified as a location parameter. The 'separator' may be used as a delimiter character to extract and print/display a group of characters separated by the 'separator' character. When a separator is specified, the location value number (Val No.) indicates which group to access. Val No. 1 accesses the first group before the delimiter character, Val No. 2 accesses the second group of characters, etc.

Note: If this Dictionary Item has specified a secondary file access, the data value location is in the Secondary Buffer; otherwise, it is in the Primary Buffer.

If a function is specified by this Dictionary Item, the location parameters are NOT used to access explicit data values; the function itself must specify access to data values via attribute functions. In this case, the data value location holds the final results of the function. Any original data value placed in the specified location field from previously reading a data file record is overwritten by performance of the function.

The function parameters in a Dictionary Item specify the access of one or more explicit data values from the Primary Buffer and/or from the Secondary Buffer as desired. Computations may be performed to obtain the final data value to be output. Note: The Dictionary Item itself is not performing these functions but is supplying the AQL processor with the parameters needed to perform the function.

The output conversion parameters describe the width and justification of the output data field, as well as the actual output format (alphanumeric, numeric, dollar, date, etc.). At the time the output conversion is performed, the location of the raw data value (explicit or implicit) to be output is specified by the location parameters.

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## 9.6 SECONDARY FILES

The Dictionary Item specifies the secondary file to be opened and the key of the record to be read. A record read from any secondary data file is placed in the Secondary Buffer.

The location parameters contained in the Dictionary Item specifies the location of the data value to be accessed from the Secondary Buffer for printing/displaying.

The record image of this secondary file record remains in the Secondary Buffer until overwritten by another secondary file access operation. This occurs whenever another secondary file access Dictionary Item is encountered or during the processing of the next record from the primary data file.

NOTE: Only one secondary file is available at any moment. Multiple secondary file records may be accessed by sequentially accessing them and saving the desired data values (see the PUT function which stores a data value into an unused attribute in the Primary Buffer).

If function parameters are included in a Dictionary Item which accesses a secondary record, the results of the function are left in the Secondary Buffer in the location specified by the Dictionary Item location parameters. Any value which is already in that location is overwritten by the function.

The output data value which occurs when the parameters of this Dictionary Item are performed comes from the field in the Secondary Buffer specified by the location parameters.

## 10.0 CREATING/MAINTAINING DICTIONARY ITEMS

AQL contains a Dictionary Maintenance System for adding, changing, or deleting Dictionary Items. To preserve the Appgen data base integrity, only those Dictionary Items originally created by AQL can be changed or modified. If modification of an Appgen-created Dictionary Item is desired, create an alternate Dictionary Item accessing the same data value(s) and incorporating the desired changes.

Dictionary Maintenance is invoked by entering the command 'demo AQ'.

Once the 'demo AQ' command is entered, a Dictionary Maintenance screen appears allowing adding, changing, and deleting of Dictionary Items. Menu choices 4 and 5 lead to Dictionary Maintenance for synonyms and wild-card characters.

Synonym Dictionary Items allow you to enter an alternate word for the reserved AQL key words like BY, WITH, AND, etc. This capability allows you to create new AQL control words that may be more meaningful to your personnel.

Redefinition of the standard wild-card characters "*" and "?" may be performed using menu choice 5 of the Dictionary Maintenance menu.

Operator's instructions for the maintenance of Dictionary Items, synonym Dictionary Items, and wild-card characters are found in Appendix L, Operator's Guide to Dictionary Maintenance.

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## 11.0 EXAMPLES OF OPERATIONS USING DICTIONARY ITEM PARAMETERS

Using Dictionary Item parameters, AQL manipulates data values in the Primary Buffer and the Secondary Buffer. The sequence of operations which occur when a set of Dictionary Item parameters are processed are:

1. The current primary data file record is already in the Primary Buffer.

2. Secondary file access, if any, is performed. The secondary file record is read into the Secondary Buffer.

3. The Dictionary Item functions, if any, are performed. The results of the function have left either the Primary or Secondary Buffer in the data value location specified by the Dictionary Item location parameters.

4. The data value in the location specified by the location parameters is converted and displayed/printed.

When all operations are complete for one Dictionary Item, AQL proceeds to the operations for the next Dictionary Item listed in the AQL sentence output criteria element. The data values in both the Primary Buffer and the Secondary Buffer remain intact and may be used with subsequent Dictionary Items until:

1. A subsequent Dictionary Item specifies another secondary file read (the Secondary Buffer is overwritten).

2. All Dictionary Items listed are processed and AQL reads a new "current record" from the primary data file into the Primary Buffer.

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## 11.1 PRINT/DISPLAY A DATA VALUE

The Dictionary Item specifies the location of the data value and the output conversion parameters to be used when preparing the value for printing.

The location parameters are Att #, Val #, and Sep (Separator), specifying location in either the Primary or Secondary Buffer. If secondary file parameters are included in this Dictionary Item, the location is in the Secondary Buffer; otherwise, it is in the Primary Buffer by default.

The output conversion parameters are Format, Max, and Just. The Format parameter specifies alphanumeric, numeric, dollar, date, etc. (see Appendix B, Format Specifications). For alphanumeric formats 'Max' specifies the maximum length of data that can be displayed/printed. For numeric formats 'Max' specifies the maximum value that can be displayed; the width is included in the format specification itself. 'Just' specifies right or left justification of the output data within the field width; if the character string is too long, the excess characters "wrap around" the column width and appear in the same column on the next line. If the numeric data value is too large, the entire field is blanked out.

| Format | Data Value | Just | Max | Result |
|---|---|---|---|---|
| A | LONG COMPANY NAME | L | 9 | LONG COMP<br>ANY NAME |
| $9,214 | 157250 | R | 9999999 | $1,572.50 |
| $3,27 | 157250 | R | 99999 | |

Dictionary Item field two, 'Desc', is also part of the output parameters. The text contained in this field appears as the column header on the output report. It is centered in a field of dashes if it is shorter than the width of the output data value field itself (as determined by 'Max' and 'Format' parameters). If the 'Desc' text is longer than the allowable data value field width, the output column width is equal to the length of the 'Desc' text plus one blank character for column separation spacing.

In the second example line above, the format $9,214 means: print with a dollar sign, maximum of 9 digits to the left of the decimal point, print with commas, maximum of 2 digits to the right of the decimal point, maximum field width of 14 characters including all punctuation.

In the third example line, the format $3,27 means: print with a dollar sign, maximum of 3 digits to the left of the decimal point, print with commas, maximum of 2 digits to the right of the decimal point, maximum field width of 7 characters including all punctuation. No Result is printed because the width of the formatted field, $1,572.50, exceeds the maximum field width of 7 specified in the format. Dictionary Item Example:

| | | |
|---|---|---|
| 1. | Dict Item Id | CUST.NAME |
| 2. | Desc. | Customer Name |
| 3. | Type | S |
| 4. | Keyword | |
| 5. | Att # | 1 |
| 6. | Val # | 0 |
| 7. | Sep | |
| 8. | Format | A |
| 9. | Max | 25 |
| 10. | Just | L |
| 11. | Func | |
| 12. | Changeable | |
| 13. | 2nd File | |
| 14. | 2nd Key | |

Results:

Prints column heading text (Customer Name) centered in a field of 25 dashes. The output data value has been extracted from the Primary record Buffer which contains the current record from the primary data file now being processed.

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## 11.2 PRINT/DISPLAY FROM A SECONDARY FILE

Adding a secondary filename and a secondary record key to a Dictionary Item causes a secondary file record to be read into the Secondary Buffer. Other parameters and operations specified by the Dictionary Item proceed as described previously except that the specified data value location is in the Secondary Buffer rather than the Primary Buffer.

The secondary record key to be used could be a literal value; more typically it is a function specifying use of a data value from the Primary Buffer. In the example below the salesman's number, which is in location attribute 4, value 0 of the Primary Buffer, is used as the key to read the salesman's file and extract the salesman's name for inclusion on the Output Report.

Note: The secondary file record is read directly into the Secondary Buffer. The Output Report formatting parameters come from the original Dictionary Item which called for the secondary file read. No Dictionary Items from the salesman's data file are involved in this operation. The calling Dictionary Item's location parameters specify which attribute # and value # to access in the Secondary record.

Dictionary Item Example:

| | |
|---|---|
| 1. Dict Item ID | SLS.NAME |
| 2. Desc | Salesman Number |
| 3. Type | S |
| 4. Keyword | |
| 5. Att # | 1 |
| 6. Val # | 0 |
| 7. Sep | |
| 8. Format | A |
| 9. Max | 20 |
| 10. Just | L |
| 11. Func | |
| 12. Changeable | |
| 13. 2nd File | "slsman" |
| 14. 2nd Key | A(1,4) |

Results:

This Dictionary Item causes a read of the 'slsman' file using as a key the data value in attribute 4 of the Primary Buffer (this attribute contains the salesman number for the current customer record from 'cust' now being processed). After the secondary record is read, the salesman name is contained in attribute 1 of the Secondary Buffer.

## 11.3 PERFORM A FUNCTION

Dictionary Items which perform functions may access data values from the Primary and/or the Secondary Buffers. The Access function A(f,a,v) specifies accessing attribute 'a', value 'v' in Buffer f, where f=1 for the Primary Buffer and f=2 for the Secondary Buffer.

The results of the function operation are left in either the Primary or Secondary Buffer in the location specified by the location parameters in the Dictionary Item. If secondary file access parameters are present in the same Dictionary Item as the function, the function results are stored in the Secondary Buffer; otherwise, it is stored in the Primary Buffer.

After the function is performed, the output parameters are used to print/display the resultant data value from the appropriate Buffer.

Dictionary Item Example:

| | |
|---|---|
| 1. Dict Item ID | FUNCTION |
| 2. Desc | Sum |
| 3. Type | S |
| 4. Keyword | |
| 5. Att # | 6 |
| 6. Val # | 0 |
| 7. Sep | |
| 8. Format | N6,211 |
| 9. Max | 99999999 |
| 10. Just | R |
| 11. Func | A(2,3)+A(2,4) |
| 12. Changeable | |
| 13. 2nd File | "supp.data" |
| 14. 2nd Key | A(1,10) |

Results:

> The secondary data file "supp.data" is read using the data value in attribute 10 of the Primary Buffer as the key. The data values in attribute 3 and 4 of that secondary record (which has now been read into the Secondary Buffer) are summed; the results are placed in attribute 6, value 0 of the Secondary Buffer for printing.

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## 11.4 NON-PRINTING DICTIONARY ITEMS

Suppression of the Dictionary Item column heading and output data value is achieved by specifying an output field width of zero (Max = 0) and leaving a null value or a single space character in the Dictionary Item description field, 'Desc'. The resultant output is a blank column, one or two characters wide.

All other operations specified by the Dictionary Item occur normally: the secondary file read, if any occurs, and the function, if any, is performed. Resultant data values are left in the appropriate record Buffer.

This characteristic allows the accessing and calculation of intermediate values without printing.

## 11.5 ALTERNATE DICTIONARY ITEMS

More than one Dictionary Item can point to the same data value location; entry of an alternate Dictionary Item allows processing the data value differently from the original Dictionary Item process. For instance, output field width and justification parameters can be different, a scaling function can be specified, etc.

Dictionary Item Example:

| | | |
|---|---|---|
| 1. | Dict Item ID | CUST.NAME.RJ |
| 2. | Desc | Customer Name |
| 3. | Type | S |
| 4. | Keyword | |
| 5. | Att # | 1 |
| 6. | Val # | 0 |
| 7. | Sep | |
| 8. | Format | A |
| 9. | Max | 25 |
| 10. | Just | R |
| 11. | Func | |
| 12. | Changeable | |
| 13. | 2nd File | |
| 14. | 2nd Key | |

Results:

This Dictionary Item prints the customer name right-justified in a field width of 25 characters. (The original Dictionary Item "CUST.NAME" printed the customer name left justified.)

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## 11.6 THROW-AWAY CONNECTORS

To provide a smoother flow of the AQL Sentence, special fieldnames (Dictionary Items) can be added which are not used by AQL and won't result in a syntax error. Dictionary Items of this type are called Throw-away connectors; they are characterized by entering a 'T' into the Dictionary Item 'Type' field. No other fields need to be completed for these Dictionary Items. For more information see APPENDIX K, Master Dictionary Maintenance.

Dictionary Item Example:

| | | |
|---|---|---|
| 1. | Dict Item ID | have |
| 2. | Desc | |
| 3. | Type | T |
| 4. | Keyword | |
| 5. | Att # | |
| 6. | Val # | |
| 7. | Sep | |
| 8. | Format | |
| 9. | Max | |
| 10. | Just | |
| 11. | Func | |
| 12. | Changeable | |
| 13. | 2nd File | |
| 14. | 2nd Key | |

Results:

This Dictionary Item identifies the word 'have' as a throw-away connector.

## 11.7 KEYWORD SYNONYMS

Appendix C is a listing of the reserved key words which control the AQL processc. You may enter synonyms for these keywords in order to produce a more natural AQL sentence.

Menu choice five on the Dictionary Maintenance main menu screen leads to the entry of synonyms. The only entry required to set up a synonym is to identify the keyword which is the equivalent.

As an example, entering a synonym for 'WITH' named 'which' and entering 'have' as a throw-away would allow an AQL sentence to perform selection criteria using the words 'which have' rather than 'WITH'; e.g., show cust which have ADDR EQ 'ATL.....'. (See APPENDIX K for more detail.)

## 11.8 NATURAL SENTENCES

By using alternate Dictionary Items, throw-away connectors, and keyword synonyms, a natural sentence entry can be created to fit the vocabulary of your specific installation. Consider the AQL sentence:

SHOW cust BY CUST.NAME CUST.NAME ADDR YTD.SLS

An equivalent sentence using alternates, throwaways, and synonyms would be:

SHOW cust file by the customer name. Display the name, address, and the year-to-date sales.

This is accomplished by:

1. Setting up throw-away connectors:

| | |
|---|---|
| the | and |
| file | sales. |
| customer | |

2. Setting up alternate Dictionary Items for existing Dictionary Items.

| Alternate Dictionary Item | Existing Dictionary Item |
|---|---|
| name. | CUST.NAME |
| name, | CUST.NAME |
| address | ADDR |
| year-to-date | YTD.SLS |

Note: The punctuation marks following the fieldname must be included as part of the actual Dictionary Item name (name. and name, and sales.).

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## 11.9 WILD-CARD CHARACTER REDEFINITION

The standard wild-card characters to be used for selection criteria are "*" and "?". These characters may be changed using the Dictionary Maintenance screens. See APPENDIX K, Master Dictionary Maintenance, and APPENDIX L, Operator's Guide to Dictionary Maintenance.

## 12.0 DICTIONARY ITEM FUNCTIONS

Functions specified by Dictionary Item parameters are performed after any secondary file access specified by the Dictionary Item. The function uses the specified data value location (att #, val #, separator) as destination for the resultant function output value. This data value location is in the Primary Buffer unless a secondary file access is also specified by this Dictionary Item. In this event the data value location would be in the Secondary Buffer.

Functions make no assumptions as to the source of input data values other than that they must be in either the Primary Buffer or the Secondary Buffer. These input values must be picked up by the function through the Access or Attribute function: A(f,a,v).

The process performed by a function is the equation:

D.V. = (expression)

Where 'expression' is the function to be performed and D.V. is the Data Value produced by the function. This D.V. is printed/displayed in the output report column for the Dictionary Item. It is also stored in the specified location of the appropriate buffer (Secondary Buffer if this Dictionary Item performs a secondary file access; otherwise, Primary Buffer). This D.V. may later be extracted for further processing by another Dictionary Item operation.

A Dictionary Item may contain multiple functions subject only to the 73 character maximum length of the Function field in the Dictionary Item. These functions are separated by a semicolon. Performance of multiple functions proceeds from left to right; each function in the series may use the results of the preceding function. The final data value is stored in the specified attribute, value location of the Primary or Secondary Buffer, overwriting any previous value stored there. See Paragraph 12.12, Multiple Functions.

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## 12.1 CONVENTIONS

SPACES:

Except within literals enclosed in quotes, the use of spaces is discretionary. All functions are free format.

UPPER/LOWER CASE:

The use of upper and lower case in the entry of functions is determined by the function. The examples show the proper usage.

LITERALS:

Integer numbers only can be used for mathematical computations.

Alphanumeric strings must be enclosed in quotes.

Y and N may be used for YES and NO.

PARENTHESES:

Parentheses are used for grouping expressions for appropriate interpretation.

MULTIPLE FUNCTIONS:

Multiple functions may be included in a Dictionary Item. They are separated by semicolons (;). Subsequent functions in the same line use values from the immediately preceding function through use of variable "$" expression. The value stored in $ is not carried over from one Definition Item to the next.

## 12.2 ATTRIBUTE

The Attribute or Access expression extracts a data value from the Primary or Secondary Buffer to be used in the function process. The general form of the Attribute expression is:

A(buffer, attribute, value) where:

- buffer is 1 for the Primary Buffer, 2 for the Secondary Buffer
- attribute is the attribute number to access
- value is an optional argument to access a particular value from a multi-valued attribute

*Example*:

A(1,3) would load the data value from the Primary Buffer attribute 3 into the expression.

*Example*:

A(2,5,2) would load the data value from the Secondary Buffer attribute 5, value 2 of a multi-valued field.

Note: Care must be taken in specifying value 0. It does not affect the results if the attribute is single-valued. If the attribute is multi-valued, the entire contents of the attribute are loaded as if it were a string, which includes the delimiting value mark between values.

*Example*:

if A(2,5) = 7]1]14]-1]3]5

then A(2,5,2) = 1
A(2,5,3) = 14
A(2,5,1) = 7
A(2,5,0) = 7]1]14]-1]3]5

Note: The character ‘]’ represents the value separator character.

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## 12.3 PUT

The current value of the expression may be stored in any location in the Primary or Secondary Buffer. Any data value already in that location is overwritten. The general form of the Put expression is:

P(buffer, attribute, value, expression) where

- buffer is 1 for the Primary Buffer, 2 for the Secondary Buffer
- attribute is the attribute number in which the data value is to be stored
- value is the value number in which the data value is to be stored
- expression is any valid function, the results of which are "Put"

Note: Value = 0 causes the entire attribute to be overwritten, not just a single value.

*Example*:

If the current function value is 5, P(1,2,3,$) places 5 in the third value of attribute 2 in the Primary Buffer.

*Example*:

if A(1,2) = 7]14]6]2

then P(1,2,3,"6") results in A(1,2) = 7]14]6]2
or P(1,2,0,"6") results in A(1,2) = 6

## 12.4 CONCATENATE

Two data values may be concatenated using the concatenate ':' operator. The general form of the concatenate expression is:

Operand : operand where

- operand may be any valid function
- : (colon) indicates the concatenate operation

Multiple concatenations may be performed within one function.

*Example*:

If A(1,5) = 17.2 then A(1,5):"K" evaluates to 17.2K

*Example*:

"THIS IS" : "CONCATENATION"

evaluates to

THIS IS CONCATENATION

*Example*:

"Cat":" and ":"Dog"

evaluates to

Cat and Dog

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## 12.5 GROUP EXTRACT

The Group Extract expression extracts a string of characters from a single-valued attribute using a delimiter character. This function does not work on a multi-valued attribute. The general format of the group extract expression is:

G(location, delimiter, skip) where

- location is the source of the data value expressed by an attribute expression A(buff, attr, val) or the $ expression (which means use the current function) or any function which results in a string.

- delimiter is the delimiter character which separates the groups of characters in the source data value. It must be enclosed in quote marks.

- skip is an optional number of groups to skip. '1' skips the first group, '2' skips two groups, etc. A skip of '0' skips none, picking up everything before the first delimiter.

Note: Standard Appgen multi-part keys are NOT multi-valued. This function may be used to extract a piece of a multi-part key.

*Example*:

```
if A(1,7) = ABC*371*2

then  G(A(1,7),"*",0) evaluates to "ABC"
      G(A(1,7),"*",1) evaluates to "371"
      G(A(1,7),"1",0) evaluates to "ABC*37"
```

## 12.6 STRING LENGTH

The string length expression determines the number of characters in a data value. The general form of the string length expression is:

#(expression) where

- # is the string length function
- expression is any valid function which results in a string

*Example*:

if A(2,5) = "CITY OF HOUSTON"

then #A(2,5) evaluates to "15" (spaces are included in the length of literals)

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## 12.7 TEXT EXTRACT

The Text Extract expression extracts a specified number of characters from a source string without the use of a delimiter character. The general form of the Text Extract expression is:

T (location, start, count) where

- location is the source of the data value such as A(2,5) or $
- start is the starting character number
- count is the number of characters to extract

*Example*:

if A(2,5) = P5722A441

then T(A(2,5),2,4) evaluates to "5722"
or T(A(2,5),1,5) evaluates to "P5722"
or T(A(2,5),6,1) evaluates to "A"

## 12.8 LOCATE

The Locate expression locates a string (or data value) in a multi-valued attribute. Each value of the multi-valued attribute is searched sequentially until a value containing the exact string (or data value) is found. The search ceases when the first occurrence is located and returns the value number location.

Note: Multi-part Appgen keys are NOT multi-valued; this function does not work with multi-part keys.

If the string (or data value) is not found, the expression evaluates to "0". If the data value being searched for is a subset of any data value searched, no match is found.

The general form of the Locate expression is:

L (buffer, attribute, string) where

- buffer attribute is the location of the attribute to be searched
- string is the string of text or data value to be located

*Example*:

if A(2,5) = 17]15]22]5]7]31]15]8

then L(2,5,"5") evaluates to "4"
or L(2,5,"15") evaluates to "2"
or L(2,5,"27") evaluates to "0"

*Example*:

if A(1,17) = JAN]FEB]APR]JUL]SEP]DEC]JAN]MAR

then L(1,17,"APR") evaluates to "3"
or L(1,17,"JAN") evaluates to "1"
or L(1,17,"AP") evaluates to "0"
(subset matches not located)

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## 12.9 MATHEMATICAL

Mathematical expressions are used to perform computations between two operands. Standard mathematical symbols and commonly accepted algebraic forms are used. The arithmetic operators are:

+ addition
- subtraction
* multiplication
/ division

Mathematical expressions are evaluated in the true algebraic form:

- Multiplication and division are performed first, proceeding from left to right

- Addition and subtraction are performed next, preceding again from left to right.

- Parentheses may be used to modify the order of evaluation. Evaluation proceeds from the innermost set of parentheses to the outermost, as in standard algebraic processes.

*Example*:

if A(1,7) = 5
and A(1,3) = 3
and A(2,4) = -1

then A(1,7)*A(1,3)+A(2,4) evaluates to (5x3)+(-1)=14
or A(1,7)*(A(1,3)+A(2,4)) evaluates to 5x(3-1)=10

The general form of the mathematical expression is:

(Operand) operator (operand) where

- operand can be a data value obtained by the Access or Attribute expression: A(buff, attr, val) or the $ expression, a literal number (i.e., a constant)
- operator is one of the arithmetic operators

A more complex form of the mathematical expression is:

(expression) operator (expression) where

- expression may be any valid AQL expression defined in this section. It must be set off by parentheses to effect the evaluation of the expression first.

## 12.10 SUMMATION

The Summation expression sums the values of a multi-valued attribute up to and including the limiting value number. This function does NOT work on Appgen multi-part keys. The general form of the summation expression is:

S (buffer, attribute, value, expression) where

- buffer is 1 for the Primary Buffer, 2 for the Secondary Buffer
- attribute is the attribute number whose data values are to be summed
- value is the limiting value number through which the summation is to occur. If all values are to be summed, this parameter should be 'O' or omitted.
- expression is an optional argument which is a valid function that is to be performed on each iteration of the sum loop.

*Example*:

if A(2,4) = 1]2]3]4]5]
then S(A(2,4)) evaluates to "15"
or S(A(2,4),3) evaluates to "6"

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## 12.11 IF (CONDITIONAL)

The IF (Conditional) expression compares two arguments. If the arguments are numeric, the comparison is based on the magnitude of the values. The arguments are considered to be numeric if each contains only numerals, one decimal, and/or a + or a -. Alphanumeric strings are compared alphabetically.

The general form of the comparison condition is:

(expression) operator (expression) where

- expression evaluates to one of the arguments being compared
- operator is the comparison operator

The comparison operators are:

| | |
|---|---|
| = | Equal |
| < | Less Than |
| > | Greater Than |
| <= | Less Than or Equal To |
| >= | Greater Than or Equal To |
| <> | Not Equal |

The general form of the IF expression is:

if (condition, then, else) where

- condition is the comparison being performed
- then is the expression that is performed if the condition is true
- else is an optional expression to be performed if the condition is false

*Example*:

if A(1,3) = -5
then if(A(1,3)<0,-1,1) evaluates to "-1"

if A(1,3) = 5
then if(A(1,3)<0,-1,1) evaluates to "1"

if A(2,4) = 100
then if(A(2,4)=100, expression1, expression2)

results in expression 1 being performed. Otherwise, i.e., if A(2,4) is not equal to 100, the IF expression results in expression2 being performed.

## 12.12 MULTIPLE FUNCTIONS

A Dictionary Item may contain a series of functions to be executed sequentially. They are entered into the Dictionary Item function field separated by semicolons. As each function in the series is performed, the resulting immediate value is placed in a temporary register. The next function in the series may access this value as the variable "$". The net result value of all functions in the series is finally stored in the attribute, value location in either the Primary or Secondary Buffer, as specified by the location parameters of the Dictionary Item.

*Example*:

| | |
|---|---|
| 1. Dict Item ID | FUNCT. |
| 2. Desc | function |
| 3. Type | S |
| 4. Keyword | |
| 5. Att # | 5 |
| 6. Val # | 0 |
| 7. Sep | |
| 8. Format | N4,28 |
| 9. Max | 999999 |
| 10. Just | R |
| 11. Func | A(1,2)+A(1,3);$*A(1,4) |
| 12. Changeable | |
| 13. 2nd File | |
| 14. 2nd Key | |

Results:

The data values in Attributes 2 and 3 of the Primary Buffer are added together and temporarily stored in "$". The next function retrieves this value and multiplies it by the data value in Attribute 4 of the Primary Buffer. The final value is stored in Attribute 5 of the Primary Buffer, overwriting any previous value that may have been there.

Note: The value stored in $ is only valid in the current function line; it does not carry over to the next Dictionary Item.

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## APPENDIX A:

Customer List
File 'cust'

| ---------Customer Name--------- | ----------Address---------- | —YTD Sales— |
|---|---|---|
| HUGHES AND DRYDEN | SAN ANTONIO, TX. | 31,450.00 |
| BEST CHEMICALS | HOUSTON, TX. | 7,280.00 |
| M. J. ROTH AND CO. | NEW ORLEANS, LA. | 6,350.00 |
| WESTERN TIMBER | SAN ANTONIO, TX. | 17,340.00 |
| MOORE WIRING | HOUSTON, TX. | 9,600.00 |
| GEORGIA AMALGAMATED | ATLANTA, GA. | 28,650.00 |
| THE HELIX CONSORTIUM | NEW ORLEANS, LA. | 102,500.00 |
| STATOR MACHINE WORKS | DALLAS, TX. | 28,500.00 |
| THE HOUSTON COMPANY | HOUSTON, TX. | 63,205.00 |
| FREIGHTWAYS | NEW ORLEANS, LA. | 44,280.00 |
| BESTWAYS COMPANY | SAN ANTONIO, TX. | 12,400.00 |
| GOLIATH | DALLAS, TX. | 18,200.00 |
| THE FASTER COMPANY | ATLANTA, GA. | 72,780.00 |
| EASTERN SALES | DALLAS, TX. | 92,510.00 |
| NEW DIRECTION CO. | HOUSTON, TX. | 84,220.00 |
| JOHN STEADY AND COMPANY | HOUSTON, TX. | 91,050.00 |
| BINDER PRINTING | NEW ORLEANS, LA. | 6,200.00 |
| CROSSCUT SUPPLY | DALLAS, TX. | 1,800.00 |
| HIGHLAND FREIGHT | SAN ANTONIO, TX. | 27,900.00 |
| DYNAMIC VENTURES INC. | DALLAS, TX. | .00 |
| JASPER ELECTRONICS | ATLANTA, GA. | 6,310.00 |
| U.S. OFFICE FURN. | HOUSTON, TX. | 94,670.00 |
| LOEB INSURANCE CO. | SAN ANTONIO, TX. | 17,200.00 |
| AMERICAN GRAPHICS | ATLANTA, GA. | 4,820.00 |
| STANDBY SUPPLY CO. | ATLANTA, GA. | 81,050.00 |
| UNITED METALS | NEW ORLEANS, LA. | 4,380.00 |
| PACER AIRWAYS | NEW ORLEANS, LA. | 22,170.00 |
| MUTUAL OF GEORGIA | ATLANTA, GA. | 19,430.00 |
| AMERICAN DIODE | HOUSTON, TX. | 2,700.00 |
| TELEPORT INC | DALLAS, TX. | 14,250.00 |
| OCEAN TESTING | SAN ANTONIO, TX. | 112,370.00 |
| DONNER PAPER CO. | ATLANTA, GA. | 82,225.00 |
| STANDARD ENGINE | DALLAS, TX. | 19,300.00 |
| AMERICAN GROUP | HOUSTON, TX. | 21,500.00 |
| COASTAL FLYER | ATLANTA, GA. | 77,250.00 |
| LEISURE SPORTS INC. | SAN ANTONIO, TX. | 71,300.00 |
| CONCOURSE ENTERPRISES | NEW ORLEANS, LA. | 22,110.00 |
| HERCULES LIFTERS | ATLANTA, GA. | 53,500.00 |

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## APPENDIX B: FORMATS AND CONVERSIONS

### Data Formats used by Dictionary Items in the AQL Processes

| FORMAT | DESCRIPTION |
|---|---|
| A | Alphanumeric text string |
| Nx.yz | Numeric data:<br>x - maximum number of digits before (to the left of) the decimal place<br>y - number of digits after (to the right of) the decimal place<br>NOTE: Maximum decimal places allowed = 9 and total numeric digits (x + y) = 15<br>z - the total field width including all digits, commas, decimal point, and minus sign<br>NOTE: If the period is replaced by a comma in the format, the digits before the decimal have imbedded commas. |
| $x.yz | Dollar data. Same as the Numeric mask except prepended by a $ sign. |
| D | Date. Outputs date values in the format MM/DD/YY. |
| D4 | Date. Outputs date values in the format MM/DD/YYYY. |
| P | Phone. Outputs phone number in the format XXX-XXX-XXXX or XXX-XXXX depending on how many characters are in the field. |
| IP | International Phone Number. This will format the same as the Phone mask if seven or ten characters are entered. If any other number of characters are entered, the data will appear exactly as it was entered. |
| S | Social Security. Outputs social security number in the format XXX-XX-XXXX. |
| Y | Yes/No data field Y or N. |

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*Examples*:

| Data Value | Format | Max | Just | Output Results |
|---|---|---|---|---|
| 78003 | A | 5 | R | 78003 |
| 75931 | A | 4 | L | 7593 |
| STRING7 | A | 5 | L | STRIN |
| STRING6 | A | 5 | R | RING6 |
| 71704 | N3.27 | 99999 | R | 717.04 |
| 73708 | N5.05 | 99999 | R | 73708 |
| 4800300 | N5,210 | 9999999 | R | 48,003.00 |
| 4800207 | $5,211 | 9999999 | R | $48,002.07 |
| 123183 | D | 8 | L | 12/31/83 |
| 123183 | D4 | 10 | L | 12/31/1983 |
| 7139740018 | P | 12 | L | 713-974-0018 |
| 7139740018 | IP | 12 | L | 713-974-0018 |
| 0117139740018 | IP | 18 | L | 0117139740018 |
| 477668510 | S | 11 | L | 477-66-8510 |
| Y | Y | 1 | R | Y |
| 78305 | N1.13 | 99 | L | 7.8 |
| 78331 | N1.13 | 99 | R | 3.1 |
| -72405 | N3.26 | 99999 | L | 724.05 |

## APPENDIX C: AQL RESERVED WORDS

Certain words are considered to be reserved by the Appgen Query Language processor.

Synonyms for those words may be included as needed by the user. To add a synonym, use Dictionary Maintenance. (See Appendices K and L.)

The words eligible for synonyms are:

AND

BREAK-ON

BY

BY-DSND

EACH

OR

TOTAL

WITH

WITHOUT

EQ

GE

GT

LE

LT

NE

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## APPENDIX D: GLOSSARY

| | |
|---|---|
| Attribute | In Appgen files, fields are called attributes, and records are called items. |
| Appgen | The Appgen Development System (Applications Generator) from Appgen Business Software, Inc. |
| CR | Carriage Return. Same as New Line, Enter, or Return. Sometimes expressed as <CR>. |
| Data | Denotes any or all facts, numbers, letters, or symbols which can be stored, processed, or produced by a computer. |
| Data File | The file that stores the characters themselves, a collection of data. |
| Default | In the absence of optional instructions entered by the operator, the program supplies a predetermined set of instructions called the default: i.e., you can enter instructions to format your own row and column specifications in Appgen Query Language or accept the automatic default. |
| Dictionary File | The "Table of Contents" for the data file. File layouts show the contents of the dictionary file; attribute number, value, attribute type, dictionary name, prompt format, and length. The information itself is stored in the data file. |
| Dictionary Name | The attribute name as recognized by the program; e.g., CUST.NO is the dictionary name (or DICT.NAME) for the attribute name "Customer Number". |
| Display | The output of an AQL sentence is called the display and is normally sent to your screen. |
| Field | A part of a record. The address is a field in the individual customer record, the record containing all of the information about an individual customer. Fields are equivalent to attributes in Appgen files. |
| File | A set of similar records stored in the computer. One file may contain sales records, etc. A set of related records. |
| Inquiry | Procedure for requesting the computer to display specific information. |
| Output | Information or data that is transferred from the internal storage of a computer to a screen, a printer, or external media. The output of an Appgen Query Language sentence is the body of information that you have requested. |

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| | |
|---|---|
| Record | A group of related facts (fields); e.g., one customer number with customer name, address, Y-T-D sales, and salesman number constitutes one record in our example file "cust". Records are called items in Appgen files. |
| Screen | The CRT (display) Screen. |
| Sentence | An Appgen Query Language command that makes an inquiry into the data base. |
| Shell | The interface to the UNIX Operating System. |
| Shell Prompt | A character that appears on the screen that tells you the operating system is ready to accept your commands. |
| SHOW | A verb in an Appgen Query Language sentence. SHOW calls the Appgen Query Language processor to do the sorting, selecting, etc. |
| System | In general, refers to the operating system of the computer. |
| Switches | In the Appgen Query Language processor, switches are options between the verb "SHOW" and the filename; e.g., -a, -h, etc. |
| Text Strings | Text characters in the AQL sentence that are to be printed in headings, footings, total lines, and/or subtotal lines. This text is set off from the remainder of the AQL sentence by enclosing the text in quote marks. Blank spaces and characters reserved by the system are allowed in a Text String but may cause unexpected results elsewhere. |

## APPENDIX E: SWITCHES

The switches that may be used in the Switches Element of an AQL sentence are:

-a Alias. Saves the AQL command line for later reexecution.

-p Printer. Send the output to the printer.

-r Rows. Specifies number of rows to print on each page.

-c Columns. Specifies number of columns to print on each page.

-e Cancel page eject. Replaces top and bottom margins on printed page with a single blank line.

-h Heading. Prints a specified line of text at the top of the report.

-f Footing. Prints a specified line of text at the bottom of the report.

-s Spooler. The "spooler" is the printing program on your system. To change the name of the spooler use the -p switch followed by the -s switch and the name of the spooler. e.g., -p -s nq

where "nq" is the name of your spooler.
(See Paragraph 6.2 for an example.)

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## APPENDIX F: LABELING ITEMS

The Labeling Items used to insert current values into report labeling text and to control the printing columns are:

| | |
|---|---|
| %c<n> | Column. Begin printing the following text in column 'n'. |
| %d | Prints the current date in 'mmm dd, yyyy' form (e.g., Apr 26, 1984). |
| %t | Prints the time and date in 'hh:mm:ss mmm dd, yyyy' form. (e.g., 12:00:00 Apr 26, 1984) |
| %f<n> | Prints the filename. If the integer 'n' is specified, the name is left justified in 'n' blanks. |
| %p<n> | Prints the page number. If the integer 'n' is specified, the page number is right justified in 'n' blanks. |
| %b<n> | Prints the control break value. If the integer 'n' is specified, the value is justified in 'n' blanks. |
| %b0 | When imbedded in a heading or footing, causes a page break whenever a break occurs. |
| %% | Prints the percent sign itself. |

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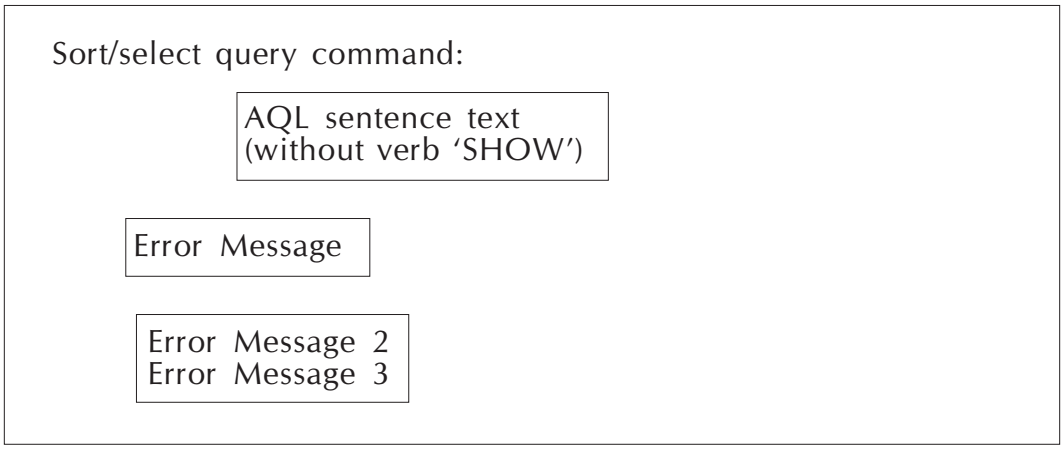
## APPENDIX G: ERROR MESSAGES

The AQL processor checks the AQL sentence for syntax (order) and available filenames and fieldnames within the data dictionary of the specified filename. Error messages appear in the format as shown below:




The text of the AQL sentence entered appears starting on the line below the words "Sort/select query command:". (Note: the verb 'SHOW' is not included in the sentence display). If the AQL sentence is longer than the remaining space on the display line, it wraps around and continues on the next lower display line.

Up to three error messages are displayed. An error in the AQL sentence is identified and described by position within the sentence (argument number) and by type of error. Each word following the filename is considered an "argument" of the AQL sentence; thus, argument 3 is the third word after the filename.

The actual error messages consist of up to three messages as follows:

1. Error in argument X ('word') of output criteria:

   where X is the argument number of the word causing the error and 'word' is the actual text of the word which caused the error.

2. Error Message Text:

   this is the text of the error message itself as described in the examples below.

3. Item 'word' is not in data dictionary:

   where 'word' is the actual field name from the AQL sentence that does not exist in the data dictionary of the specified filename.

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If an error message is longer than the space remaining on the display line, it will automatically wrap around to continue in column one of the next lower line.

**Error Messages**

| | |
|---|---|
| Message: | Can't open file 'filename' |
| AQL Example: | show cust CUST.NO CUST.NAME |
| Meaning: | There is no data file named 'filename' in the current directory or operator does not have read/write permission to file. |
| Message: | Expression should start with selection, sort, or output clause. |
| AQL Example: | show cust SLS.NME |
| Meaning: | The word SLS.NME cannot be identified as a selection clause, a sort clause, or as an output criteria. SLS.NME cannot be found in the dictionary file of file 'cust'. |
| Message: | Expression terminated prematurely; expected <fieldname>. |
| AQL Example: | show cust BY SLS.NO BY |
| Meaning: | At least one more fieldname is needed to complete the AQL sentence. |
| Message: | Expected <fieldname> after BY/BY-DSND |
| AQL Example: | show cust BY SLS.NME SLS.NAME YTD.SLS |
| Meaning: | The fieldname SLS.NME cannot be found in the data dictionary of file 'cust'. |
| Message: | Expected EACH or <fieldname> after WITH/WITHOUT |
| AQL Example: | show cust WITH SLS.NME..... |
| Meaning: | The word SLS.NME following WITH or WITHOUT is not the word EACH, nor can it be found in the data dictionary of file 'cust'. |

| | |
|---|---|
| Message: | Expected <fieldname> after WITH/WITHOUT EACH |
| AQL Example: | show cust WITH EACH SLS.NME..... |
| Meaning: | The word SLS.NME following EACH cannot be found in the data dictionary of file 'cust'. |
| Message: | EACH keyword only valid after WITH/WITHOUT |
| AQL Example: | show cust WITH CUST.NO GE 3100 EACH CUST.NO LE 3150 |
| Meaning: | The word EACH may only be used in a selection clause and must immediately follow the words WITH or WITHOUT. |
| Message: | Expected <item value> after WITH/WITHOUT <operator> |
| AQL Example: | show cust with YTD.SLS GE BY SLS.NAME..... |
| Meaning: | The word BY following the WITH/WITHOUT operator GE cannot be identified as an item value. |
| Message: | Expected additional selection criteria after .AND/OR |
| AQL Example: | show cust WITH CUST.NO GE 3100 AND BY .CUST.NAME..... |
| Meaning: | The word AND in a selection clause must be followed by another operator (e.g., GE 3100 AND LE 3200) or by another selection clause (e.g., GE 3100 AND WITH YTD.SLS GE.....) |
| Message: | Expected 'labeling text' or <fieldname> following BREAK-ON keyword |
| AQL Example: | show cust BY SLS.NO BREAK-ON SALES.NO CUST.NAME..... |
| Meaning: | The word SALES.NO following BREAK-ON must either be a labeling text or a fieldname in the data dictionary of file 'cust'. |

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| | |
|---|---|
| Message: | Expected <field name> following BREAK-ON 'labeling text; |
| AQL Example: | show cust BY SLS.NO BREAK-ON 'Salesman Number' WITH ADDR EQ..... |
| Meaning: | The word WITH following the labeling text 'Salesman Number' cannot be found in the data dictionary of file 'cust'. |
| Message: | Expected 'labeling text' or <field name> following TOTAL keyword. |
| AQL Example: | show cust BY SLS.NO TOTAL SALES.NUM CUST.NAME.... |
| Meaning: | The word SALES.NO following TOTAL must either be 'labeling text' or a fieldname in the data dictionary of file 'cust'. |
| Message: | Expected <fieldname> following TOTAL 'labeling text' |
| AQL Example: | show cust BY SLS.NO TOTAL 'Salesman Number' WITH ADDR EQ..... |
| Meaning: | The word WITH following the labeling text 'Salesman Number' cannot be found in the data dictionary of file 'cust'. |
| Message: | Expected additional output criteria |
| AQL Example: | show cust SLS.NO SLS.NAME |
| Meaning: | The word SLS.NME cannot be identified as a fieldname in the data dictionary for file 'cust'. |
| Message: | Expected additional sort or output criteria |
| AQL Example: | show cust BY SLS.NO SLS.NME |
| Meaning: | The word SLS.NME cannot be identified either as an additional sort criteria or as a fieldname in the data dictionary for file 'cust'. |

## APPENDIX H: APPGEN APPLICATION EXAMPLE

This appendix describes the process of producing a sales report from the Customer Master file of the Appgen Accounts Receivable (A/R) software package. To perform this process, AQL & A/R must first be installed on your system; this should be performed by your dealer. The steps to produce the Customer Sales Report are as follows:

1. At the main menu level, select the Accounts Receivable menu choice. The Accounts Receivable main menu appears.

2. As a response to the "Please enter desired selection" prompt, enter the command as shown below:

   !sh

   Please enter desired selection: !sh

3. At the $ prompt, enter the command to display the files in this directory:

   ls

   This displays the filenames. Note: There are several versions of the file AR-CUSMAS, differing in the suffix and prefix (AR-CUSMAS, D.AR-CUSMAS, AR-CUSMAS.1, etc.). The prefix "D." indicates the data dictionary file for the data file (e.g., D.AR-CUSMAS). The suffix represents the company number for a multi-company environment such as AR-CUSMAS.1 or AR-CUSMAS.2. Filenames with the "D." prefix are the data dictionaries for the data files for all companies.

4. To get the allowable fieldnames for the Customer Master file for any company at the $ prompt enter:

   show D.AR-CUSMAS BY Att # key Desc

   This AQL sentence displays the field names in order, by field number.

5. To display the sales report enter an AQL sentence specifying the filename of the file to be accessed and the fieldnames of the fields to be displayed.

   show AR-CUSMAS.1 BY NAME NAME YTD.SALES

   This sentence produces a screen display of the Customer Master file records showing the Customer Name and Year-To-Date sales, arranged alphabetically by Customer Name.

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6. To return to the Accounts Receivable main menu, at the $ prompt enter a CONTROL-D. This is performed by pressing the CNTL key (or CTRL key on some keyboards) as if it were a shift key and pressing the 'D' key while continuing to hold the CNTL key down. This results in a response from the system of: 'Hit return to continue'. Pressing the return key causes the A/R menu to reappear.

## APPENDIX J: SETTING UP DICTIONARY MAINTENANCE

Dictionary Maintenance requires several elements to be present before it becomes operational. First, you must be in the proper directory (the directory in which the data and dictionary files reside). Second, dictionary maintenance uses a program called *Maint* that comes with either the Appgen Run Time or Appgen Development System; therefore, one of the Appgen binary directories must be on your path, either appgen/bin or runtime/bin. (See the installation instructions for Appgen or your operating system manual for more information on changing your path). If your screen returns an error message: "demo: chain away failed; prog was "*Maint*", no such file or directory", *Maint* was not in your path.

Lastly, there are some files in the 'appgen/AQ' directory that must be copied into the directory where you plan to maintain a dictionary. This is accomplished by changing to the directory in question and typing "demo AQ". The first time you enter that command the program will recognize that the necessary program files are not in the current directory, and after prompting you for confirmation it will set up the environment appropriately.

When all three of these conditions are met, dictionary maintenance may begin by typing "demo AQ" at any time.

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## APPENDIX K: MASTER DICTIONARY MAINTENANCE

Paragraphs 11.6, 11.7, and 11.9 of this manual discuss adding throw-away connectors and keyword synonyms and changing wild-card Dictionary Items in the data dictionary for a specific data file. Please note that these Dictionary Items exist only in the data dictionary for one specific file and cannot be used in an AQL sentence when accessing other data files.

This appendix describes the process of adding these types of Dictionary Items (throw-aways, synonyms, and wild-cards) so that they are available on a local basis within a directory and/or on a global basis within the entire system. To perform this process you must first understand the UNIX system environment directory structures and pathname processes. The Appgen file structure includes a data dictionary for each data file and a Master Dictionary in the 'appgen/AQ' directory that is considered the "global" Master Dictionary available to all other directories. You may create a local "Master Dictionary" for a specific directory by logging to that directory and copying the global Master Dictionary. Use the command:

```
cp /usr/appgen/AQ/D.MASTER D.MASTER
```

Note: See your system administrator or dealer for the correct pathname of the AQ directory. The above 'cp' command reflects the typical path.

When performing an AQL sentence, the AQL processor first looks for the sentence arguments (BY, WITH, fieldnames, etc.) in the data dictionary of the specified file. If the argument is not located there, the Master Data Dictionary for the current directory (if available) is searched.

By selectively placing the throw-away connectors, synonyms, and wild-card re-definitions in directory Master Dictionaries or in the Master Dictionary of directory '/etc', these AQL arguments may be made available on the local directory level or on the global system level.

The Master Dictionary of a directory is maintained by first logging in to the desired directory, then entering the command:

```
demo AQ
```

The standard Dictionary maintenance main menu screen as described in Appendix L (Operator's Guide to Dictionary Maintenance) appears. Refer to Appendix L for adding, changing, and deleting Master Dictionary Items. Please note that any items not created by AQL cannot be changed or deleted; this process assures the integrity of the existing data bases.

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## APPENDIX L: OPERATOR'S GUIDE TO DICTIONARY MAINTENANCE

The AQL Dictionary Maintenance System with the sample tutorial data and dictionaries may be accessed by logging into the AQL directory (usually appgen/AQ - see your system administrator or dealer). To change or add to the sample file 'cust', the user must enter the command 'demo AQ' and then choose selection one on the Dictionary menu and select the file 'cust'.

In the remaining pages of this manual, the various programs for maintaining dictionaries are displayed describing the options available and how to use them. For further information, return to APPENDIX J, APPENDIX K, and Paragraphs 11.6, 11.7, and 11.9.

Note: Any dictionary item created with the Appgen Development System programs AG021000 and AG030200 may not be deleted by the dictionary maintenance functions. Only dictionary items created through this AQL dictionary maintenance menu may be deleted.

To access the Dictionary Maintenance programs for your application dictionaries, type:

```
demo AQ
```

while in the application directory where the desired dictionaries reside.

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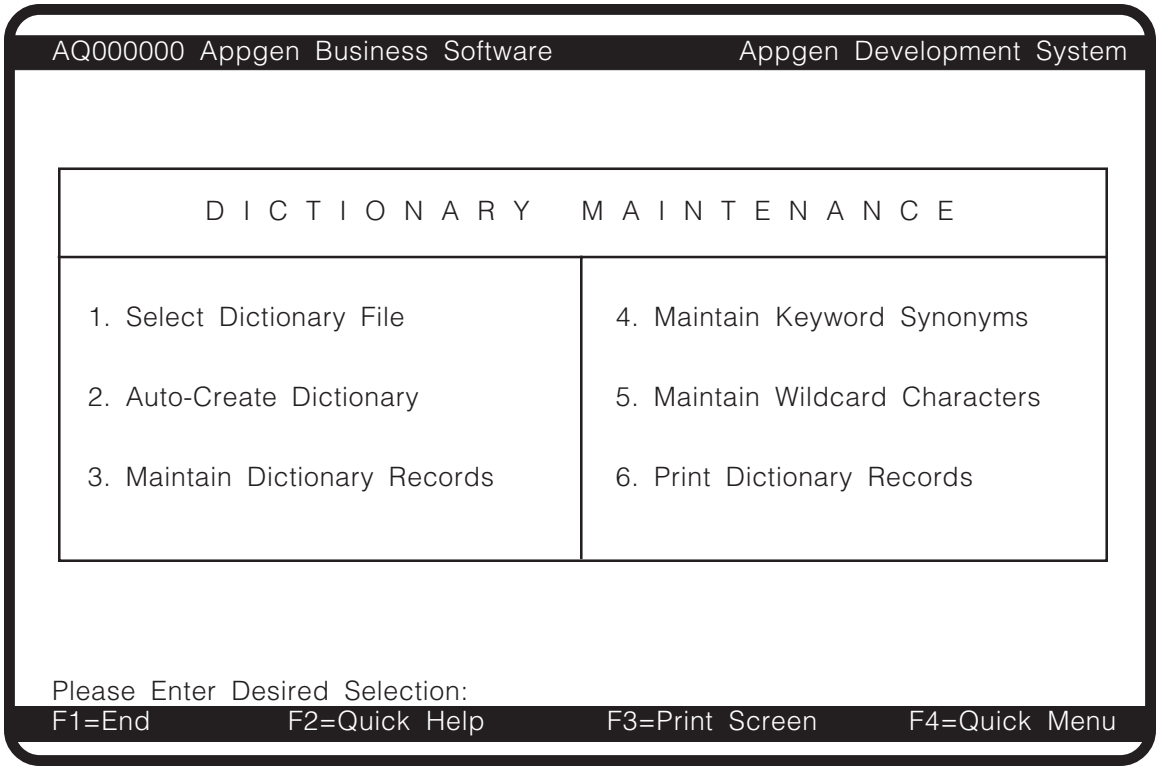
## Dictionary Maintenance

Use these programs to create and manipulate Appgen data dictionaries.




Select the function you desire by entering the appropriate number. Type 'E' or 'END' to return to the previous menu.

1. **Select Dictionary File** - Use this function to select a dictionary file to maintain. If the dictionary does not exist, you will be asked if you want to create it now. If you respond 'Y', an empty dictionary file will be created. Use the Auto-Create function if you want a dictionary created in association with a data file. A dictionary file must be selected here before any of the subsequent programs in Dictionary Maintenance can be used. At any entry point in this Dictionary Maintenance section you may press ^V (control V) to see which dictionary file is currently selected.

2. **Auto-Create Dictionary** - Use this function to automatically create a dictionary from the parameters in a *Maint* PDEF. The dictionary will describe the Primary Data file of the PDEF. You must enter the name of an existing *Maint* PDEF.

3. **Maintain Dictionary Records** - Use this function to add, change, delete, or simply view the dictionary records.

Dictionary Maintenance

4. **Maintain Keyword Synonyms** - Use this function to maintain Keyword Synonyms.

5. **Maintain Wildcard Characters** - Use this function to maintain Wildcard Characters.

6. **Print Dictionary Records** - Use this function to print the dictionary records with all their attributes.

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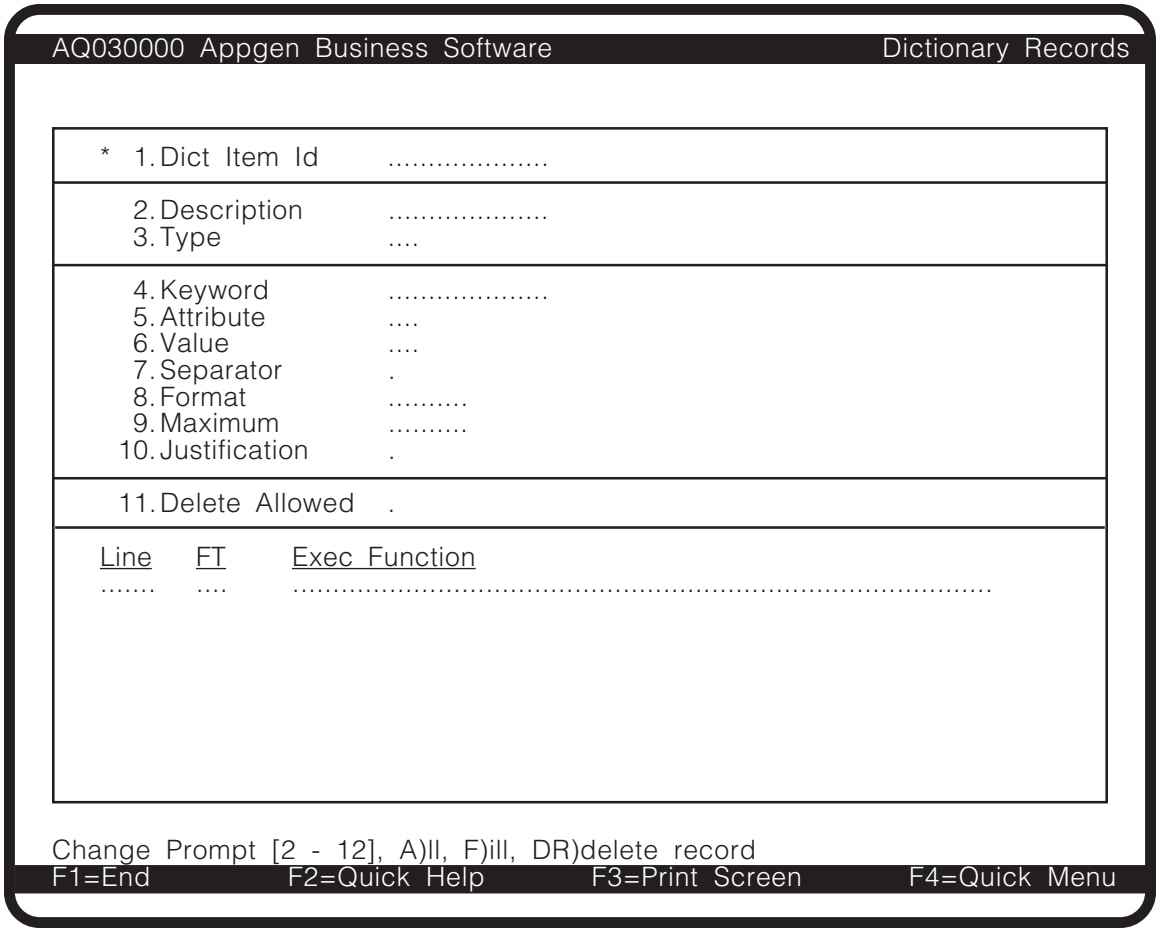
## Dictionary Records

Use this screen to maintain the dictionaries of Appgen data files. New dictionary items may be added, existing ones changed or deleted. However, dictionary items used by Appgen application reports may not be deleted. If you call up an item not created by this system, the item will be displayed but you will not be able to delete it. Please note that any number of dictionary items may be created for an attribute in a record. They can be set up with different widths, names, and even formats. This allows total flexibility in sorting, selecting, and displaying your data. So if you would like to generate a report which restricts the customer name to 15 columns, you could do it by setting up a new dictionary item for customer name. Call it "short.name", for instance, and specify the width to be 15. After creating the new dictionary item, try an AQL sentence like "show cust short.name", and the system will fold all customer names into 15 columns. Dictionary maintenance thus gives you the ability to create reports with complete control over the final appearance.



Dictionary Records

1. **Dict Item Id** .... A required entry.

   Format: Alpha/Numeric. Length: 0 to 20 characters.

   Enter the name of the field you wish to define. This is the name you would specify in the output specifications of an AQL sentence to display the data in a particular field of an Appgen file. Examples are CUST.NO for the customer number in the AQL sample data file, or YTD.SLS for the year-to-date sales in the sample file.

2. **Description** .... An optional entry.

   Format: Alpha/Numeric. Length: 0 to 20 characters.

   Enter a brief description of the field. This description will appear as the column header in AQL reports.

3. **Type** .... A required entry.

   Format: Alpha/Numeric. Length: 0 to 4 characters.

   S = Single-Valued
   C = Controlling multi-valued
   D# = Dependent multi-valued, #=att number of controlling
   V = Verify
   X = Verify Delete
   T = Throw-away connector
   K = Keyword synonym

   Enter the type of attribute. Most attributes are "S" (single-valued). The majority of the other attributes are controlling or dependent multi- valued. The dependent attributes should specify which attribute is their controlling attribute, for example "D8". The "V" and "X" types are only used in Appgen development but are included here for completeness. The "T", throw-away type, normally only appears in the Master Dictionary and defines a name which may appear in an AQL sentence for clarity or naturalness but is ignored in the processing of the sentence. Examples are "the" and "a". The "K" type is also normally confined to the Master Dictionary. The "K" type allows the addition of synonyms for AQL key words, again to provide freedom in sentence construction. An example would be to create a dictionary item called "WHICH" and make it a synonym for the AQL keyword "WITH". Then a sentence could be constructed like "show cust which have ytd.sls gt '10000'" instead of "show cust with ytd.sls gt '10000'". In that example, the word "have" would have been set up in the Master Dictionary as a throw-away. See the appendix of the AQL manual for a listing of all AQL keywords. Note: All item id's or keys in Appgen should be type "S".

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Dictionary Records

4. **Keyword** .... An optional entry.

   Format: Alpha/Numeric. Length: 0 to 20 characters.

   Enter an AQL keyword for which this item is a synonym. Examples: "WITH", "BY", "AND". This prompt is only used if the type is "K"; it is skipped for all other types.

5. **Attribute** .... A required entry.

   Format: Numeric. Acceptable range: 0 to 999.

   Enter the attribute (field) number that this item defines. Use attribute zero (0) for fields that are the key or part of the key to a record. The dictionary item CUST.NO is the key to the AQL sample data file.

6. **Value** .... A required entry.

   Format: Numeric. Acceptable range: 0 to 999.

   Enter the value number of the attribute. Normally, for single-valued attributes this will be zero (0). Also, for multi-valued attributes you would specify zero here unless you wished to extract a particular value from the multi-valued list. Usually, you would only put a non-zero number here if one were defining an element in a key which is multi-part. For instance, the key to the invoice file in Accounts Receivable is composed of the Customer Number and the Invoice Number with the symbol "*" used to separate the two parts of the key. In this case you would put the number one (1) in as the value number for Customer Number, and 2 as the value for Invoice Number. Also, the symbol "*" should be entered in the Separator field for BOTH Customer Number and Invoice Number in this example.

7. **Separator** .... An optional entry.

   Format: Alpha/Numeric. Length: 0 to 1 characters.

   For multi-part keys only, enter the symbol used to separate the parts of a multi-part key. This should be entered for ALL parts of a multi-part key, including the first and last parts. See "Val #" for an example of a multi-part key.

Dictionary Records

8. **Format** .... A required entry.

   Format: Alpha/Numeric. Length: 0 to 10 characters.

   Enter the format of the item. Valid formats include:

   | | | |
   |---|---|---|
   | A | - | Alpha/numeric, any printable ASCII characters |
   | D | - | Date, displayed as MM/DD/YY, e.g. 11/25/84 |
   | Y | - | Yes/No, Yes displayed as Y, No displayed as N |
   | P | - | Phone number, displayed as NNN-NNN-NNNN |
   | S | - | Social Security #, displayed as NNN-NN-NNNN |
   | $9,216 | - | Dollar format, displayed as $999,999,999.99- |
   | N7.08 | - | Numeric format, displayed as 9999999- |

   See this manual, or the appendix of the AQL Reference Manual, for more information on formats.

9. **Maximum** .... A required entry.

   Format: Numeric. Acceptable range: 0 to 999999999.

   For alpha/numeric formats enter the maximum number of characters that will be displayed. For numeric formats enter the maximum value that can be displayed (the width is included in the format spec itself).

10. **Justification** .... A required entry.

    Format: Alpha/Numeric. Length: 0 to 1 characters.

    | Table | Description |
    |---|---|
    | R | Right Justification |
    | L | Left Justification |
    | C | Center |

    The output will be justified according to this specification.

11. **Delete Allowed** .... An optional entry.

    Format: Yes/No (Y or N).

    A non-prompted flag which says this item was created using AQL Dictionary Maintenance and can be deleted. If the item was created by the Appgen Development System Auto-Create option, then the flag will not be set and the AQL Dictionary Maintenance system will not be able to delete it (and thus possibly mess up an Appgen Application).

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Dictionary Records

**FT** .... An optional entry.

Format: Alpha/Numeric. Length: 0 to 2 characters.

Please choose one of the following columns:

| Table | Description |
|---|---|
| KF | Key Function |

**Verify Delete** .... A non-prompted field.

Format: Alpha/Numeric. Length: 0 characters.

You may not delete dictionary items not created with the AQL Dictionary Maintenance system. You may look at them, but not delete them. If you did, then some Appgen Applications might be rendered inoperable.

**Exec** .... A required entry.

Format: Numeric. Acceptable range: 0 to 99.99.

Enter a number which specifies when the function will execute.

**Function** .... A non-prompted field.

Format: Alpha/Numeric. Length: 0 to 63 characters.

Enter a function to be performed and substituted as the value of the attribute defined in this item. Functions can concatenate different attributes together, add, subtract, multiply, divide, do text extractions, etc. See the appropriate appendix of this manual for more information and examples of functions.

Dictionary Records

You may pop open this window by pressing function key number eight.


You will then be prompted with:

**13. Name** .... An optional entry.

Format: Alpha/Numeric. Length: 0 to 45 characters.

Enter a function which returns the name of an Appgen data file. This file will be opened if not opened already , and the results of the next line, the key function, will be used to read a record from the secondary file. If the open and the read are successful, then the attribute and value specified for this item are extracted and used just as if they came from the Primary file. Other attributes in the secondary file can be referenced in the "KF:" field with functions like "A(2,8)". If the open or read is unsuccessful, then an empty (null) string is substituted as the value extracted and all other references to file 2 will return null.

Note: Functions like "A(2,8)" are only valid when a secondary file is used.

**14. Key** .... An optional entry.

Format: Alpha/Numeric. Length: 0 to 45 characters.

Enter a function which will return a key to be used to read a record from the secondary file specified in the line above.

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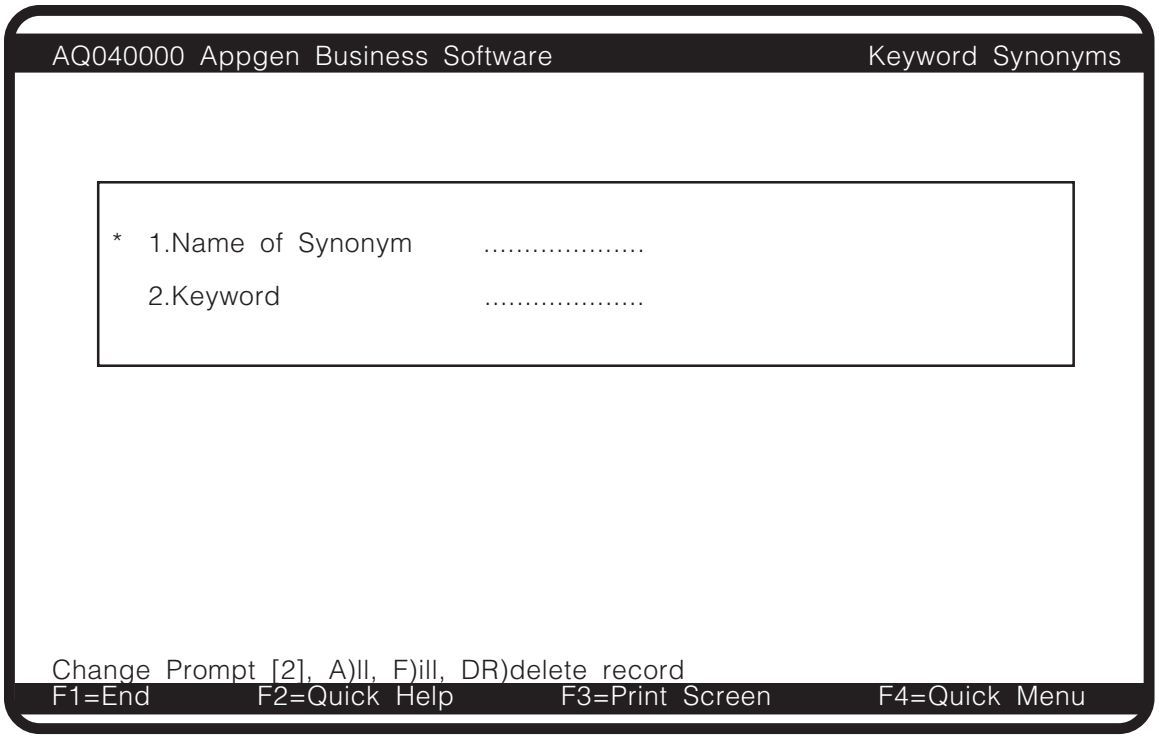
Keyword Synonyms

Use this selection to maintain keyword synonyms.




**1. Name of Synonym** .... A required entry.

Format: Alpha/Numeric. Length: 0 to 20 characters.

Enter the name of the synonym for a keyword. Do not enter a keyword or the name of a normal dictionary item.

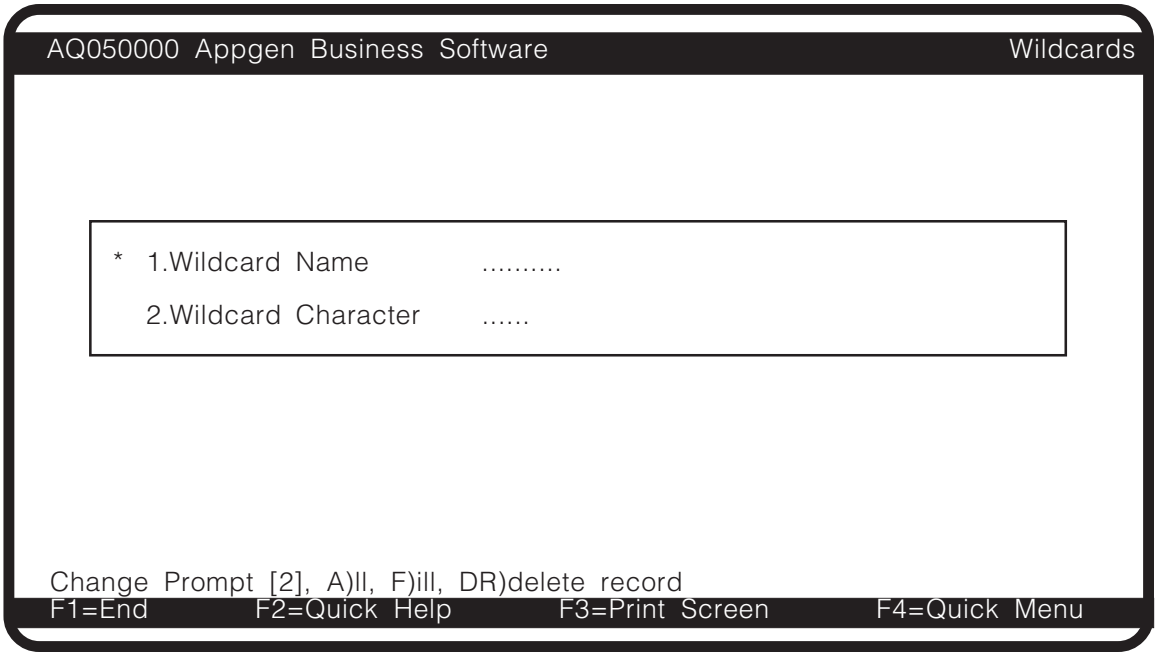
**2. Keyword** .... A required entry.

Format: Alpha/Numeric. Length: 0 to 20 characters.

Enter the keyword for which you are defining a synonym.

## Wildcards

Use this selection to maintain wildcard characters. The acceptable entries are "WILDCHAR" and "WILDSTRING". WILDCHAR defines the single-character matching wildcard. WILDSTRING defines the string-matching wildcard. For example, if the WILDCHAR were defined as the character "?", then the AQL clause "show cust with CUST.NAME = 'SM?TH'" would select SMITH or SMYTH but not one whose name was SMYTHE. If the WILDSTRING is defined as the character "*", then the clause "show cust with CUST.NAME = 'SM*'" would select all customers whose name started with the letters "SM", such as SMITH, SMYTH, and SMYTHE.




1. **Wildcard Name** .... A required entry.

   Format: Alpha/Numeric. Length: 8 to 10 characters.

   Enter either the wildcard name "WILDCHAR" or the wildcard name "WILDSTRING". WILDCHAR is for defining the wildcard character which matches a single character. WILDSTRING is for defining the wildcard character which matches any string of arbitrary length.

2. **Wildcard Character** .... A required entry.

   Format: Alpha/Numeric. Length: 0 to 1 characters.

   Enter the character which will be the wildcard character you are defining.

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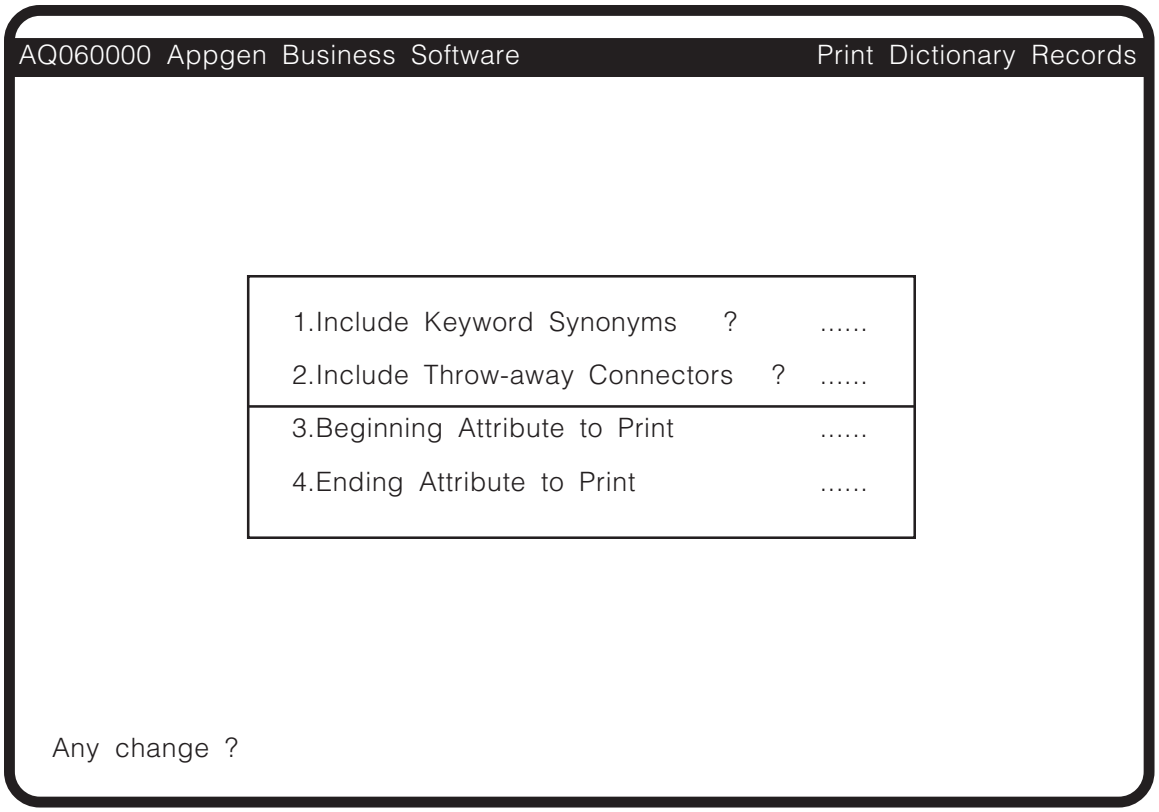
Print Dictionary Records

Use this function to print the dictionary records with all their attributes.




1. **Include Keyword Synonyms?** .... An optional entry.

   Format: Yes/No

   Enter 'Y' if you want Keyword Synonyms to appear on the listing.

2. **Include Throw-away Connectors?** .... An optional entry.

   Format: Yes/No

   Enter 'Y' if you want Throw-away Connectors included in this listing.

Print Dictionary Records

3. **Beginning Attribute to Print** .... An optional entry.

   Format: Numeric

   Enter the attribute number with which you wish to begin the report. All dictionary items for a given range (from the beginning attribute to the ending attribute you specify) will be listed.

4. **Ending Attribute to Print** .... An optional entry.

   Format: Numeric

   Enter the number of the last attribute you wish to appear on the report.

   Any change ? - Enter 'Y' to change any of the above fields. Then enter the number of the field you wish to change. When all changes are complete, enter 'N' to 'Any change' prompt.

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