CA MICS® Resource Management

MICF User Guide

Release 12.9

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Chapter 1: Introduction

The MICF User Guide describes the operation, panel displays, and features of the MICF menu-based process, which includes creating database inquiries, modifying and executing cataloged inquiries, and replaying cataloged output.

It also describes interactive access to SAS using the MSAS dialog for reporting, as well as batch reporting.

If you have questions about retrieving data from the database or generating reports, see the Database Structure and Content Guide or the MICF Reference Guide.

Chapter 2: MICF Tutorial

MICF, the CA MICS Information Center Facility, is the easiest way to access the information in the CA MICS database. This chapter introduces you to MICF and provides a structured path for learning to use it to get the information you need from CA MICS.

Additional tutorials, which are available online, answer your questions about MICF while you are using it.

This section contains the following topics:

2.1 Introduction

This section provides an overview of the purpose and major features of MICF. It is divided into the following sections.

1 - MICF Overview
2 - Major Features of MICF

2.1.1 MICF Overview

MICF provides you with a fast and convenient way to access and manipulate the data in the CA MICS database. You do not need to have an in-depth knowledge of CA MICS or SAS to effectively use the CA MICS database for reporting. Using MICF avoids the problem of inadvertently coding syntax errors in SAS. In addition, MICF's automatic validation procedures keep you from attempting to analyze data elements that do not exist in the files you have requested.

MICF includes a large number of standard inquiries that you will find to be immediately useful. You can easily copy these inquiries to your private MICF catalog and tailor them to your particular needs. Once an inquiry has been tailored, it can be saved and reused by simply selecting it from the catalog.

The optional use of color graphics provides you with the means to enhance your presentations and illustrate your results.

A comprehensive, interactive tutorial facility assists you in learning and using MICF. In addition, you have online access to all of the CA MICS documentation while you are using MICF.

When using MICF, here is what happens:

- You define the input, selection criteria, and report options.
- MICF dynamically builds the inquiry program from your specifications.
- The inquiry is executed either interactively or in batch, and the results are either displayed at your terminal or routed to a printer.

2.1.2 Major Features of MICF

MICF is a menu-based system that operates under ISPF/PDF. MICF menus behave like ISPF menus so they are easy to use.

The major features of MICF include:

- Structured inquiry composition
- Logical inquiry modification
- Direct inquiry composition
- Execution-time specifications
- Output replay
- Production interface
- Facilities for expert users
- Distributed inquiries
- User-written reports
- User Reporting interface

Each of these features is described separately below.

STRUCTURED INQUIRY COMPOSITION

MICF provides a comprehensive, full-screen system that enables you to access data in the database and generate reports interactively in a structured prompt manner without requiring you to code the request in SAS.

MICF operates by automatically translating your panel specifications into an inquiry program that performs the required operations on the database. As you request data files, operations, and reports from the MICF panels, MICF performs numerous validation checks. It helps you to avoid problems by refusing to accept clearly invalid commands and by asking you to validate the accuracy of your inquiries if you have made changes to them. For example, if you add or delete steps from an inquiry, MICF will ask you to validate it before saving or executing it.

LOGICAL INQUIRY MODIFICATION

Once created, an inquiry can be stored in your private catalog, recalled, copied, deleted, or modified. You make changes to an inquiry using the same MICF panels you used to create the inquiry originally. You do not, however, need to revisit panels that do not change.

DIRECT INQUIRY COMPOSITION

Direct inquiry composition is a feature that allows you to create an inquiry by completing a single panel. You can select from a series of predefined report formats and graphics templates for direct, express data retrieval and presentation.

EXECUTION-TIME SPECIFICATIONS

You can define inquiries so that key inquiry parameters can be specified at the time an inquiry is executed. This facility allows you to report against varying data without changing the inquiry.

You can change the following parameters at execution time:

- CA MICS database
- CA MICS file cycles
- Data selection criteria
- Execution parameters
  - Color graphics output device
  - Color graphics format set
  - SAS execution parameters (for example, whether to list SAS source code and output page dimensions)

OUTPUT REPLAY

MICF allows you to save the output produced when you run an inquiry and replay it at another time. The output is saved in an output catalog by inquiry name, date, and time, so that the results of running an inquiry against different data can be saved and replayed whenever you want throughout your data center. You also have access to reports, color graphics and CSV file output in production reporting, though access to some reports may be limited by your data center's security procedures.

When you replay an inquiry output, you can either view it on your terminal or send it to a hardcopy device. If you are replaying color graphics output, you do not need to use the type of device that was specified at the time the inquiry was originally executed. You can specify the color terminal, color printer, or color plotter to use at the time you request the replay.

PRODUCTION INTERFACE

You can generate and catalog color graphics and printed reports with the regularly scheduled CA MICS production jobs (for example, the daily CA MICS update). You can also control CA MICS production reporting with your data center's batch scheduling facilities. MICF lets you select shared inquiries for batch execution (either with CA MICS production jobs or through your own scheduling process), with printed report, color graphics output and CSV file output saved in a production catalog for later online review and printing.

Each production catalog consists of unique, user-defined printed report, color graphics, and CSV file output data sets, so you can use your data center's security facilities to limit access to sensitive reports. For example, your accounting staff may want to share a series of daily financial graphics. You can define MICF production reporting to generate and save the financial graphics during the CA MICS daily update, and you can protect the information with a security facility like RACF.

FACILITIES FOR EXPERT USERS

If you are thoroughly familiar with the CA MICS database and are accustomed to programming in SAS, two features that you will find particularly helpful are direct inquiry composition and the ability to include SAS code in your inquiries.

Direct inquiries are designed to allow you to compose a MICF inquiry quickly on a single panel. You are limited to one report and can only perform limited data manipulation with a direct inquiry, but you can complete a direct inquiry panel more quickly than you can write the corresponding SAS code. In addition, because validation functions are performed automatically by MICF and because it automatically produces error-free SAS code, you can frequently get the results you need with fewer coding attempts.

Facilities that include free-form SAS code as part of their MICF inquiries are available for experienced SAS programmers. You can insert any valid SAS statement at appropriate points in the SAS code that is generated by MICF. This facility gives you both the convenience of using MICF to handle routine operations and the freedom to add special coding at just the points you want it.

DISTRIBUTED INQUIRIES

A library of precomposed report and color graphics inquiries is included with MICF. These inquiries are an immediate source of useful reporting and color graphics presentations covering the full breadth of the CA MICS database. You can tailor the output of these inquiries through execution time data selection. In addition, you can develop customized reports for your data center with a minimum of effort by modifying copies of the distributed inquiries. The distributed inquiry names have been designed for ease of use. Each name identifies the type of output (color graphics, printer graphics, printed reports, CSV file output), the component, and the timespan (daily, weekly, monthly) reported.

USER-WRITTEN REPORTS

MICF inquiry execution and output processing includes a capability to support user-written reports. With this feature, you can consolidate on-demand reporting under MICF. For example, you can define a MICF inquiry that has two steps. The first step allocates the CA MICS file to be analyzed (that is, tells MICF which file or files you want to process) and the second step refers to a file containing the SAS source statements that create your report. With this facility, you can add existing reporting routines to your MICF catalog so that other people only need to go to a single location to initiate routine reporting.

USER REPORTING INTERFACE

The User Reporting Interface is similar to the production interface, but with notable differences. The production interface only allows selection and execution of shared MICF inquiries. The user reporting job stream is not confined by this requirement. A user reporting job stream can include MICF Inquiries from a combination of the shared and one's own private inquiry catalog.

Second, the user reporting job stream cannot be associated with a Production MICS job. Execution can be on-demand or managed through your own scheduling system.

Further, the User Reporting Interface does not require MICS Administrator authority. MICF users can create and execute their own user reporting job streams.

In addition, the User Reporting Interface can automatically generate MICF inquiries from Q&R developed, or self-contained SAS code, and add them to the job stream.

As in the Production Interface, each user reporting catalog consists of unique, user-defined printed report, color graphics, and CSV file output data sets.

2.2 Getting Started with MICF

After you read this section, you will be able to start MICF and know how to use MICF menus, commands, and help screens. In addition, you will be able to customize MICF to better meet your needs.

This section is divided into four parts:

1 - Learning to Use MICF
2 - Starting MICF
3 - Customizing MICF
4 - Adding Documentation to User-Written Inquiries

2.2.1 Learning to Use MICF

The best way to learn MICF is to use it. These sections tell you what you need to know to start MICF and answer most of the questions you are likely to ask during your first MICF sessions.

MICF contains extensive online tutorials (help screens) that you can request at any point in a MICF session. These screens provide detailed information about an operation at the time you are ready to use it.

Ask for help by typing HELP after the Command (or Option) prompt. (Your PF1 key is usually set to do this for you.) When you request help in this manner, you are immediately shown a tutorial that is relevant to the panel on which you are working.

To leave a tutorial, type END after the Command (or Option) prompt. (Your PF3 key is usually set to do this for you.) You are returned to the place in your work session from which you requested help.

The remainder of this section is divided into the following parts:

1 - Learning Path
2 - Notes for New MICF Users

2.2.1.1 Learning Path

We recommend learning MICF in the following order:

1. Read "Starting MICF" (section 2.2.2).

2. Learn how to review cataloged reports (section 2.3). Reviewing existing MICF reports is a good way to become familiar with the types of output you can expect to receive from MICF. If other people create the CA MICS reports that you use, this may be all you need to learn about using MICF.

3. Learn how to execute cataloged inquiries (section 2.4). The program that generates a MICF report is called an inquiry. MICF allows each user and the CA MICS administrator to save inquiries for later use. The saved inquiries are listed in either the shared catalog (maintained by the system administrator) or your private catalog.

4. Learn how to modify cataloged inquiries (section 2.5). Cataloged inquiries are easy to copy and to modify.

5. Learn how to create new inquiries (section 2.6). When you create new inquiries, you typically select the results that you want to see (usually one or more reports or color graphics) and determine the data sources to use. Depending on your requirements, you may also need to manipulate the data before reporting on it or graphing it.

   Tip: If you are only planning to use or modify existing cataloged inquiries, you can skip this section.

2.2.1.2 Notes for New MICF Users

If you are new to MICF, do not hesitate to log on and try it. You cannot damage the CA MICS database, and you will soon begin to feel at home with the system. Use MICF while you are reading this guide. It will make what you read more meaningful.

While experience with ISPF/PDF is helpful, it is possible to use all of MICF (except the expert features) without any specific computer knowledge. This is sufficient for reviewing cataloged output and executing cataloged inquiries. Other use of MICF is easier if you understand standard ISPF/PDF operations.

Although it is not required for all uses of MICF, you will find a familiarity with the structure of the CA MICS database files and the CA MICS documentation helpful.

You do not need to know SAS to use MICF. If you are an experienced SAS user, you may find that you can produce reports faster with MICF than with SAS because the SAS code that MICF generates in response to your panel specifications is always complete and syntactically correct. In addition, MICF checks that data elements used in an inquiry exist in the files you intend to use before executing the inquiry. For these reasons, MICF can save you both coding time and resource usage.

2.2.2 Starting MICF

This section introduces the MICF conventions for using menus and commands. Before you start MICF, you should be familiar with the types of displays, menus, and commands available to you. This section first describes the MICF panel, the menus, and the command conventions, and then shows you how to open the initial MICF menu.

2.2.2.1 MICF Panels, Menus, and Commands

MICF screen displays are ISPF panels. If you are familiar with ISPF, you can skip all but Section 2.2.2.1.7, which is on Question Mark (?) Help.

Both MICF and ISPF are very easy to use. Even if you have very little data processing experience, you will be able to learn the basics very quickly by simply sitting down at the terminal and signing on.

If you would like more information on ISPF/PDF, see IBM's reference guides on the Interactive System Productivity Facility/Program Development Facility.

The MICF panels and commands can be divided into the following categories:

- Panels and menus
- Primary commands
- Line commands
- ENTER/END conventions
- CANCEL command
- Help
- Question mark (?) help

Each of these topics is discussed below.

2.2.2.1.1 Panels and Menus

```
----------------------  CA MICS Information Center Facility ---------------------
```

```
Option ===>
```

```
      0 - MICF Options
          Review/modify MICF parameters and default options.
      1 - Reports and Graphics
          Review reports and graphics from inquiries and production jobs.
      2 - Database Inquiries
          Add, modify, or execute MICF inquiries.
      3 - Display Saved File Catalog
          Review saved file catalog and/or delete saved files.
      4 - MICF Administration
          Installation and maintenance tasks for the CA MICS Administrator.
      5 - User Reporting Jobstream Administration
          Add, modify, execute, or delete MICF inquiry jobs.
      T - Tutorial
          Learn more about MICF.
      X - Exit
          Exit from MICF.
```

```
. . . . . .
```

Figure 2-1. Primary MICF Menu

MICF screen displays are called panels. The panels can be used to present a selection list, to provide background information, to initiate data entry, or to combine these functions. Panels that let you select other panels by entering a number in response to an Option prompt are called menus. The primary MICF menu shown in Figure 2-1 is a good example of a MICF menu.

To view the MICF tutorial, enter T after Option.

2.2.2.1.2 Primary Commands

Primary commands are commands that can be entered on the first line of a MICF panel after the Command or Option prompt. Some common primary commands are listed below:

- DOC -- Display the CA MICS Document Access menu. Enter the DOC command whenever you need to search and browse the CA MICS documentation.
- DOWN -- Scroll the display down to show the next section of a list or text.
- UP -- Scroll the display up to show the previous section of a list or text.
- END -- Go back to the next higher panel above this one.
- RETURN -- Go back to the first display in this process. RETURN is like entering END repeatedly until you reach the primary options menu or other designated dialog anchor point.
- HELP -- Display the online tutorial for this panel.

2.2.2.1.3 Line Commands

```
---------------------------  Database Inquiries  ----------------------------
Command ===>                                                 Scroll ===> PAGE

Catalog     ===> PRIVATE (PRIVATE/SHARED)  Catalog Group         ===> AVAIL
Create New Inquiry ===> ______     (Name)  Name (subset display) ===> ________


Line Cmds: A Abstract V View Sample E Execute  B Batch    F Foreground
           S Select   M Modify      C Copy     R Repeat   D Delete

Cmd   Name                   Title                          Date     Time
 -   ------  ----------------------------------------  ---------  -----
 -   TSOPD3  Daily TSO Availability Report             06/06/27   13:10
 E   TSOPW3  Weekly TSO Availability Report            06/06/27   13:10
 -   TSOPM3  Monthly TSO Availability Report           06/06/27   13:10
****************************** BOTTOM OF DATA ********************************
```

Figure 2-2. Typical Use of a Line Command

Line commands are commands that you enter on the line of a panel corresponding to the item to which the command applies. For example, the E (Execute) command entered in the Cmd field of the Database Inquiries panel (Figure 2-2) selects the Weekly TSO Availability report for execution.

Line commands include the following:

A (Abstract) - Displays a description of the report that will be produced by this inquiry. The A line command is only active when issued on an inquiry row of the catalog.

V (View Sample) - Displays a sample report produced by the inquiry, if available. The V line command is only active when issued on an inquiry row of the catalog.

E (Execute) - Submits a database inquiry. The Database Execution panel is displayed and you can specify "foreground" or "batch" to set the execution type. This command may be entered on multiple lines to select additional inquiries for execution.

F (Foreground) - Submits a database inquiry in foreground execution mode. This command may be entered on multiple lines to select additional inquiries for execution.

M (Modify) - Selects an inquiry to edit.

C (Copy) - Copies the row and inserts the copy at the location indicated by an A (After) or B (Before) line command. If A or B is not entered along with the C command, the copy will remain pending until an A or B is entered, a RESET command is entered, or you blank out the C in the Cmd field.

R (Repeat) - Creates a second copy of the row on which the R was coded and adds it to the display.

D (Delete) - Deletes a row from the active display.

Note: Once a row has been deleted, it cannot be recovered and must be reentered.

2.2.2.1.4 ENTER and END Conventions

Use the ENTER and END keys in MICF the same way you do in ISPF.
ENTER COMMAND

ENTER instructs MICF to process the current panel. When the processing is complete, MICF will display the next appropriate panel. If you are on a menu when you press ENTER, MICF will perform the action indicated by the item. For example, if you select option 2 on the Primary MICF panel and press enter, MICF will display the Database Inquiries panel. If you select X instead, MICF will terminate your MICF session and return you to the CA MICS Workstation Facility panel.

If you are on a data entry panel, ENTER starts the following process:

- First, MICF validates your entries.
- Next, if errors are found, MICF redisplays the panel and gives you an error message.
- Finally, if no errors are found, MICF performs the instructions on the panel. These instructions can include executing a program or displaying another panel. Note that if the panel does not send you to another panel, the original panel will be redisplayed with your changes included. (You can leave the panel using either the END or the CANCEL command described below.)

END COMMAND

END instructs MICF to accept any changes you have made and returns you to the calling process. In most cases, this is the next higher panel in the sequence. By pressing END repeatedly, you can retrace your route and return eventually to the CA MICS Workstation Facility panel and from there to the TSO READY prompt.

Part A of the following figure illustrates the relation of ENTER and END commands when they are used with a chain of menus ending in a data entry panel.

Part B of the figure illustrates the relation of ENTER and END commands when they are used with a chain of panels that begins with a panel that starts the execution of a MICF inquiry and that ends with a panel that lets you browse the output of the inquiry.

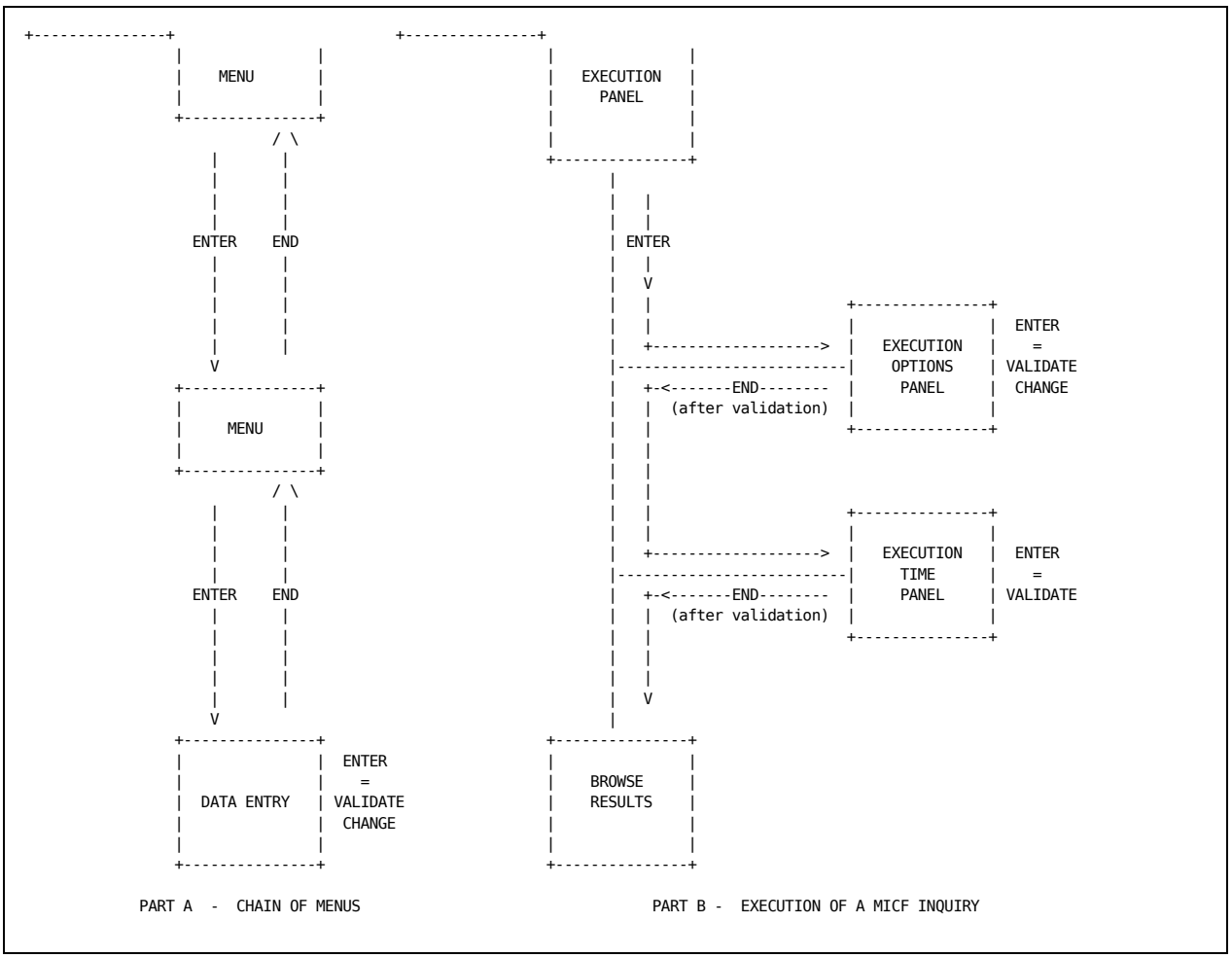


Figure 2-3. Effect of ENTER and END Commands

2.2.2.1.5 CANCEL Command

If you want to leave the panel that you are currently on without accepting the changes you have made, enter CANCEL in the command area at the top of the screen. MICF will return you to the panel from which you reached the cancelled panel and will display a message that confirms the cancellation operation.

2.2.2.1.6 Help

Extensive help is available in the form of context sensitive tutorials that can be reached from anywhere within MICF. To ask for help, either press the HELP key (usually the PF1 key) or enter HELP in the command area at the top of the screen. You can leave the tutorial at any time and return to the panel from which you requested help by pressing the END key (or typing END in the command area at the top of the screen).

The tutorial for a panel explains the exact action for each command that can be entered on that panel. In addition, the tutorial explains the data entry rules for the panel; gives an example of a completed panel; and, when appropriate, shows a sample of the output that will be generated once the panel is completed and executed.

There may be times when you need more information or a more in-depth discussion than the online panel tutorials provide. You always have immediate access to the CA MICS documentation through the DOC command. Simply enter DOC in the command or option area at the top of the panel to display the Documentation Access primary options menu. You can use the subject cross reference facility to scan CA MICS guides for keywords or phrases, or you can directly browse CA MICS guides online.

2.2.2.1.7 Question-Mark (?) Help

Many data entry fields in MICF provide you with an additional type of help if you need it. If you are uncertain as to what the appropriate choices are for the entries in a field, enter a question mark (?) in the field followed by blanks when the field is longer than one character. If question-mark help is available, you will be taken to a panel listing the available choices. By entering S in the Cmd column next to your choice, that choice will replace the question mark on the panel. If multiple selections are permitted, you can select as many as are appropriate. They will all be copied to the data entry panel. For example, if you are selecting elements to be used as independent variables in a regression analysis, you can select all of them at the same time and have them included in the list of independent variables on the regression report definition panel.

Question-mark help also works if you have several levels of decisions to make. For instance, when you are selecting a file, you also need to specify the database and timespan for the file. MICF will prompt you for this information when more than one choice is available and will automatically supply the appropriate response when only one choice is available.

2.2.2.2 Starting MICF at Your Data Center

You start MICF by selecting it from the CA MICS Workstation Facility (MWF) menu. The way you reach the CA MICS Workstation Facility will vary from data center to data center. If neither of the ways described below works, ask your CA MICS administrator to tell you how to start MWF.

There are two common ways to start MWF. One of them should work at your data center.

- Selecting MWF from an ISPF menu
- Starting MWF by executing a CLIST

Each of these ways is described separately below. For instructions on installing MWF, see section 3.3.6 in the PIOM.

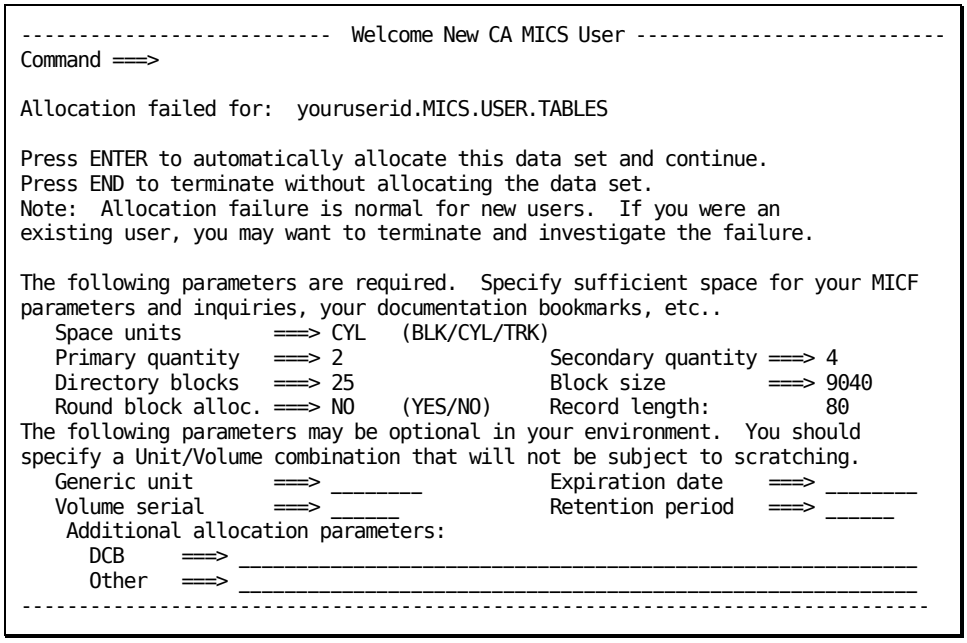
2.2.2.2.1 Selecting MWF from an ISPF Menu

```
-----------------------  ISPF/PDF PRIMARY OPTION MENU  ------------------------
OPTION ===>
                                                              USERID    - yourid
    0  ISPF PARMS  - Specify terminal and user parameters     TIME      - 10:19
    1  BROWSE      - Display source data or output listings   TERMINAL  - 3278
    2  EDIT        - Create or change source data             PF KEYS   - 24
    3  UTILITIES   - Perform utility functions
    4  FOREGROUND  - Invoke language processors in foreground
    5  BATCH       - Submit job for language processing
    6  COMMAND     - Enter TSO command or CLIST
    7  DIALOG TEST - Perform dialog testing
    8  LM UTILITIES- Perform library management utility functions
    C  CHANGES     - Display summary of changes for this release
  MWF  CA MICS     - CA MICS Workstation Facility (MWF)
    T  TUTORIAL    - Display information about ISPF/PDF
    X  EXIT        - Terminate ISPF using log and list defaults

Enter END command to terminate ISPF.
-------------------------------------------------------------------------------
```

Figure 2-4. Sample ISPF Menu Containing a CA MICS Workstation Facility

Your CA MICS administrator may have installed CA MICS so that you can reach the CA MICS Workstation Facility by selecting an option on your installation's primary ISPF option menu or another ISPF menu. If this is the case, when you start ISPF you will see a menu similar to the one shown in Figure 2-4. (The actual specifications of the menu are site-dependent.)

Select the CA MICS Workstation Facility option by typing MWF after the option prompt and pressing ENTER. You will see either the "Welcome New CA MICS User" panel (Figure 2-5) or the primary CA MICS Workstation Facility (MWF) menu (Figure 2-6). The "Welcome New CA MICS User" appears the first time you use CA MICS so that a set of user tables can be allocated for you. After they are allocated, you will go directly to the Primary MWF menu.



```
--------------------------  Welcome New CA MICS User ---------------------------
Command ===>

Allocation failed for:  youruserid.MICS.USER.TABLES

Press ENTER to automatically allocate this data set and continue.
Press END to terminate without allocating the data set.
Note:  Allocation failure is normal for new users.  If you were an
existing user, you may want to terminate and investigate the failure.

The following parameters are required.  Specify sufficient space for your MICF
parameters and inquiries, your documentation bookmarks, etc..
   Space units        ===> CYL   (BLK/CYL/TRK)
   Primary quantity   ===> 2                  Secondary quantity ===> 4
   Directory blocks   ===> 25                 Block size         ===> 9040
   Round block alloc. ===> NO    (YES/NO)     Record length:          80
The following parameters may be optional in your environment.  You should
specify a Unit/Volume combination that will not be subject to scratching.
   Generic unit       ===> ________           Expiration date    ===> ________
   Volume serial      ===> ______             Retention period   ===> ______
    Additional allocation parameters:
      DCB     ===> ____________________________________________________________
      Other   ===> ____________________________________________________________
-------------------------------------------------------------------------------
```

Figure 2-5. "Welcome New CA MICS User" Panel

Your system administrator may have specified a default unit name or volume serial identification. If so, press ENTER to allocate the data set for your user tables. If not, fill in according to site specifications and press ENTER. Depending on your site's requirements for allocating permanent data sets for TSO users, the Unit Name and Volume Serial Number will be either optional or required. If you need to change the unit name or volume serial identification, enter the correct information after the unit name prompt and the volume serial prompt and press ENTER. If your installation uses SMS, you can enter SMS keyword=value clauses (for example, STORCLAS=MICSPVT) in the field under the additional allocation parameters heading after the other prompt.

MWF will allocate the data set for your user tables and
display the primary MWF panel.

```
---------------------  CA MICS Workstation Facility (MWF)  --------------------
```

```
Option ===>
```

```
        1 - Documentation Access (DOC)
            Browse, print, and/or cross reference CA MICS documentation.
        2 - CA MICS Information Center Facility (MICF)
            Compose and/or replay CA MICS database inquiries.
        3 - SAS With CA MICS Libraries (MSAS)
            Use interactive SAS with CA MICS libraries and macros.
        4 - Management Support Applications (APPL)
            Accounting and Chargeback, Capacity Planner,
            Performance Manager and StorageMate.
        5 - CA MICS Administrator Facility (MAF)
            Operational status and tracking, installation, modification,
            maintenance, and authorization.
        T - Tutorial
        X - Exit
```

```
. . . . . .
```

Figure 2-6. Primary CA MICS Workstation Facility Menu Invoked from ISPF

When you select the MICF option (option 2) from this MWF menu, you will see the primary MICF menu (Figure 2-7).

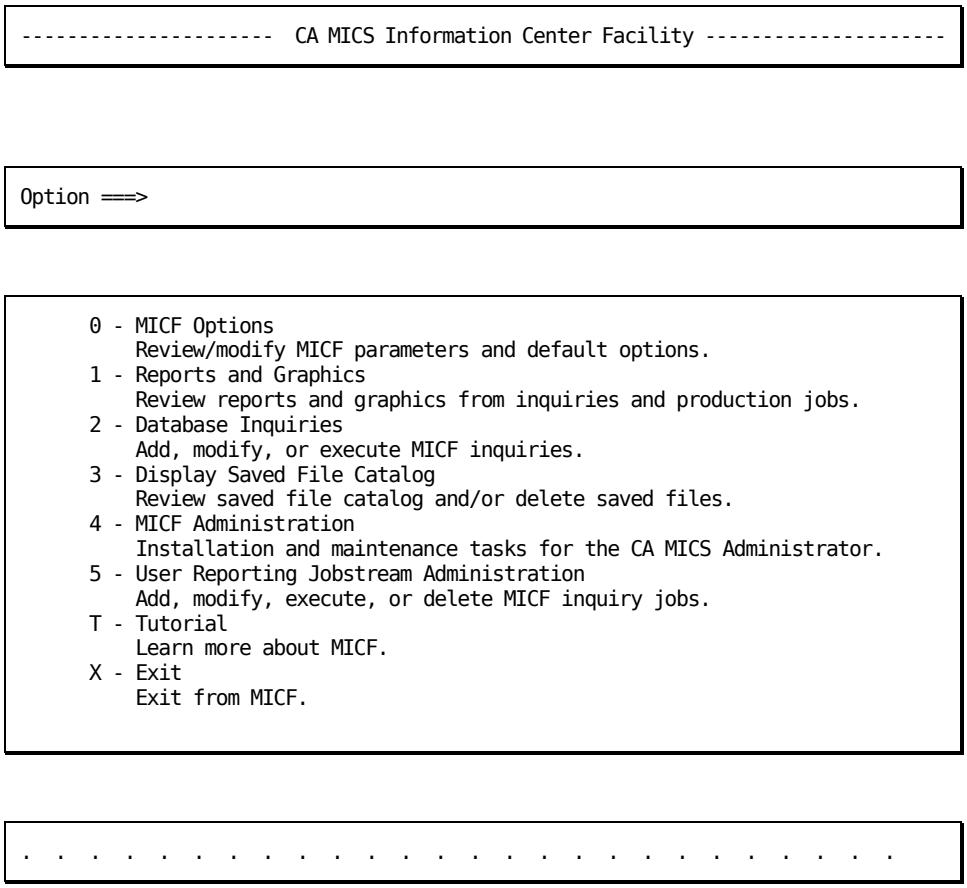


Figure 2-7. Primary MICF Menu

This menu is discussed in Section 2.2.2.2.3.

2.2.2.2.2 Starting MWF by Executing a CLIST

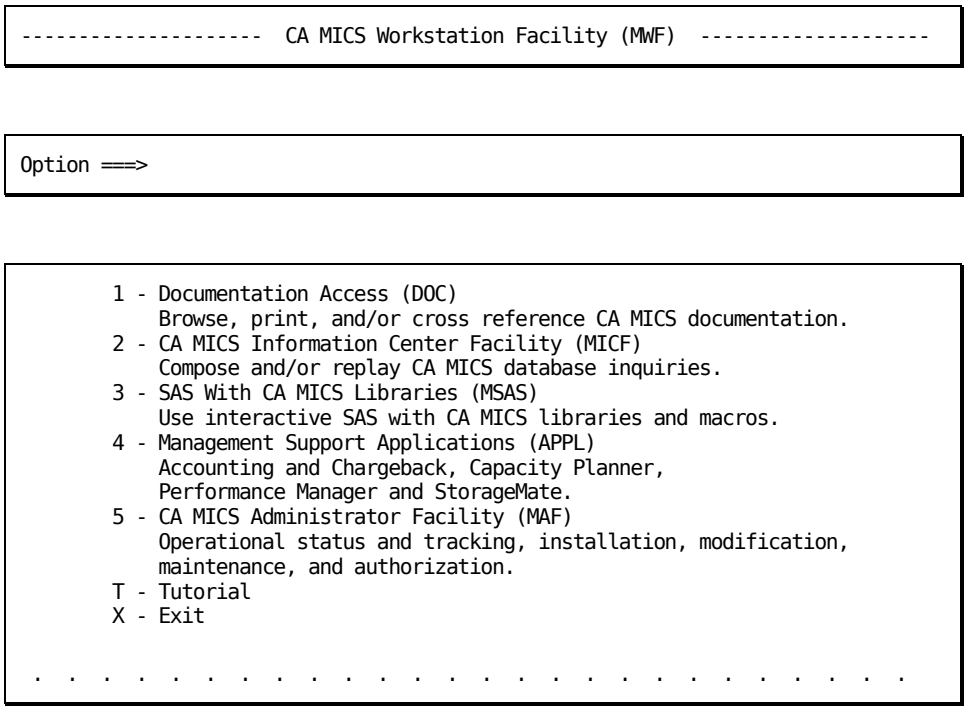


Figure 2-8. Primary CA MICS Workstation Facility Menu When Invoked from CLIST

If you cannot start MWF from a standard ISPF menu, check with your CA MICS administrator to find out the name of the CA MICS Workstation Facility CLIST. For purposes of this discussion, we will assume that it is sharedprefix.MICS.CLIST(MWF).

Sign on to TSO. From the TSO READY prompt type:

```
EX 'sharedprefix.MICS.CLIST(MWF)'
```

If you are a new CA MICS user, you are shown the panel illustrated in Figure 2-5. See the instructions under that figure.

MWF allocates the data set for your user tables and displays the primary CA MICS Workstation Facility (MWF) panel, which will look approximately like Figure 2-8.

If you have used MWF before, you will go directly to the primary CA MICS Workstation Facility Menu shown in Figure 2-8.

Choose the MICF option by entering 2 after Option. You should now see the primary MICF menu.

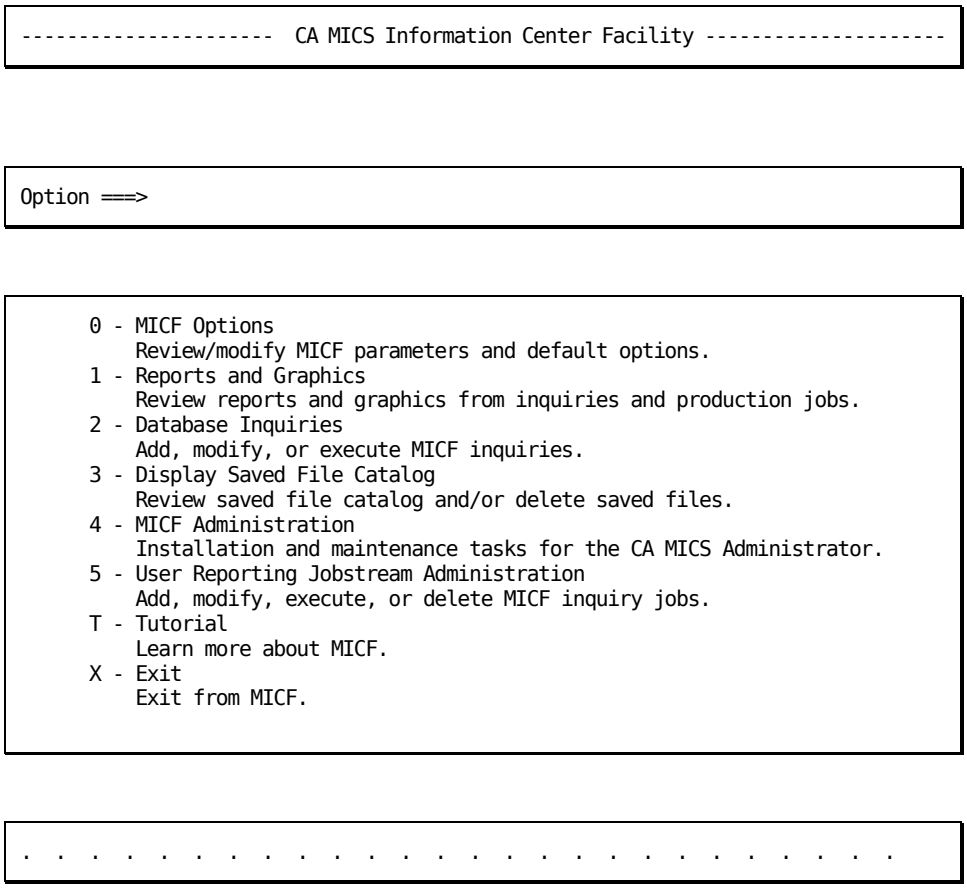


Figure 2-9. Primary MICF Menu

This menu is discussed in Section 2.2.2.2.3.

2.2.2.2.3 The Primary MICF Menu

The choices on the primary MICF menu are as follows:

o Option 0, MICF Options, is described in Section 2.2.3, Customizing MICF.

- Option 1, Reports & Graphics, is described in Section 2.3, Replaying Cataloged Output.

- Option 2, Database Inquiries, is described in Sections 2.4, 2.5, and 2.6.

- Option 3, MICF Utility Functions, contains general functions that help you to maintain your MICF environment. For example, the Saved File Catalog Display lists the files in your saved file catalog.

- Option 4, MICF Administration, is used by the CA MICS administrator to perform those tasks required to maintain the shared (or system level) MICF facilities. These include the shared MICF options, the shared inquiry catalog, the shared inquiry output catalog, and MICF production reporting. Access to this process is limited to authorized users.

- The Tutorial provides extensive online documentation of MICF, including examples of completed panels. You can also get help from any point within MICF by typing HELP after the first prompt at the top of the panel, or by pressing your PF1 key from anywhere on the panel.

- The Exit option on the menu returns you to the CA MICS Workstation Facility menu.

2.2.3 Customizing MICF

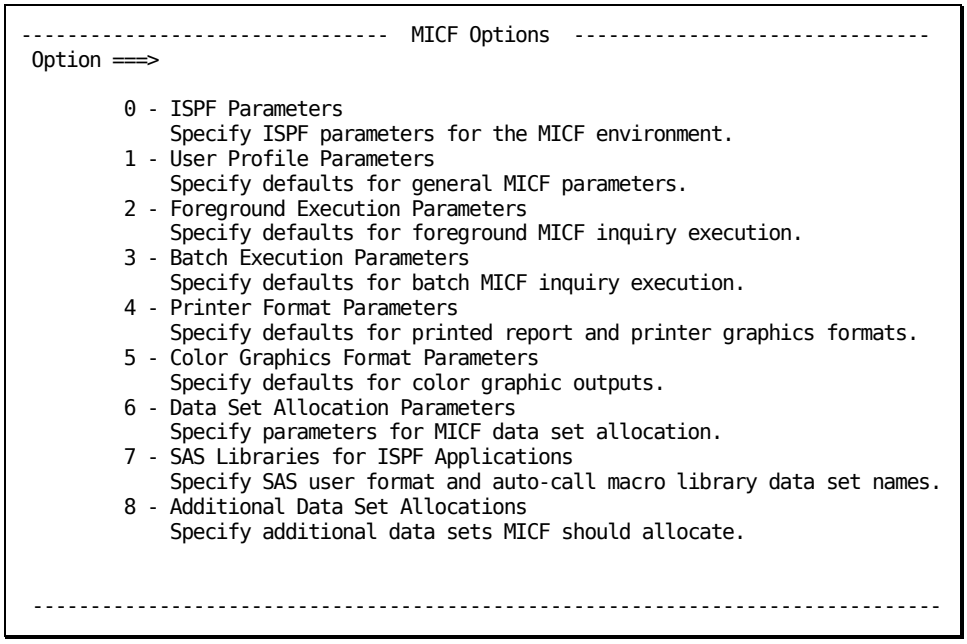


Figure 2-10. MICF Options Definition Menu

This section provides a general description of how to customize the default parameters governing your MICF sessions. You can find details on each parameter in the MICF Reference Guide.

MICF needs to know a number of things about how to allocate data sets for you, like what printer formats to use, what color graphics devices you are using, what ISPF profile you want to use when in MICF, and what defaults you would like when executing a MICF inquiry.

Usable defaults for each of the parameters in these categories were included with MICF when it was shipped to your data center. Your system administrator has further tailored these defaults to work at your site. In addition, MICF often gives you the opportunity to revise parameters temporarily for a particular inquiry.

For these reasons, we recommend that you start using MICF with the default options unchanged. As you become more familiar with MICF, you way wish to reset some of these defaults. To do so, select Option 0, MICF Options, on the primary MICF menu. The selection menu shown in Figure 2-10 appears.

Some parameters that you may eventually want to change are:

- Data Set Allocation Parameters
  - --Space for work data set
  - --Space for large saved files

- User Profile Parameters
  - --Default job statement
  - --Default execution mode (foreground or batch)
  - --Whether you will be prompted for foreground or batch execution
  - --Whether you will be given a chance to edit your JCL before you submit a job

Each of the parameter types is fully described in the online tutorials, so here we will just walk you through one type of parameter change to show you what to expect.

```
--------------------------  MICF Parameter Update  --------------------------
 Command ===>                                                Scroll ===> CSR

 Updating User Profile Parameters
 Subset Display On ===> _____________________________________________

                       Parameter Title/Parameter Value
 ------------------------------------------------------------------------------
 Batch Execution - Display generated jobstream before submitting jobs (YES/NO)?
 ===> YES

 Caps. - Translate ALL panel entry "title/label" fields to uppercase (YES/NO)?
 ===> NO

 Caps. - Translate ALL panel entry "value" fields to uppercase (YES/NO)?
 ===> YES

 Confirm Delete - Require confirmation to delete an inquiry step (YES/NO)?
 ===> YES

 Cycle(s) - Specify the default CA MICS file cycle for inquiry execution (cc-cc)
 ===> ____________________________________________________________________

 ------------------------------------------------------------------------------
```

Figure 2-11. MICF Parameter Update Panel with Update of User Profile Parameters

Suppose that you want to change the default job statement that will be used each time you submit a batch job from MICF. Select Option 1 on the MICF Options menu, and press ENTER.

The MICF Parameter Update panel will appear. The top line of this panel contains the familiar Command and Scroll prompts. These are followed by the message, "Updating User Profile Parameters" and the prompt, "Subset Display On." This prompt refers to the display under the line "Parameter Title/ Parameter Value."

The display on the bottom of the panel is an alphabetical list of all the user profile parameters that you can modify. Figure 2-11 shows the first five parameters in the list. The MICF Reference Guide contains a complete list of all the MICF options.

The line following each parameter contains a prompt arrow and the current value for the parameter. If you want to change the value, simply type over the current value with the value you want.

```
--------------------------  MICF Parameter Update  --------------------------
 Command ===>                                                Scroll ===> CSR

 Updating User Profile Parameters
 Subset Display On ===> Job

                      Parameter Title/Parameter Value
 ------------------------------------------------------------------------------
 Job Card 1 - Default Job statement #1 for ALL MICF batch processing.
 ===> //jobname  JOB (accounting information),

 Job Card 2 - Default Job statement #2 for ALL MICF batch processing.
 ===> // MSGLEVEL=(1,1),MSGCLASS=A,PRTY=5

 Job Card 3 - Default Job statement #3 for ALL MICF batch processing.
 ===> //

 Job Card 4 - Default Job statement #4 for ALL MICF batch processing.
 ===> //

 ****************************** BOTTOM OF DATA ************
```

Figure 2-12. MICF Parameter Update of User Profile Parameters with Subset Display On "Job"

There are four job statement parameters in the list. You can reach the four job statements by scrolling through the list. Notice that the information under the Parameter Title/Parameter Value line changes, but the information above the line does not. If you know the first letter or letters of the parameters that you want to change, a faster way to reach them is to complete the "Subset Display On" entry at the top of the panel. For example, if you ask to subset the display on "Job", the parameters shown in Figure 2-12 would appear on your screen. Note that in performing this subsetting, capitalization is important. If you enter "JOB" or "job", no matching parameter would be found.

The information shown for the default job statements will vary from the example shown above. Your MICF administrator will have provided you with defaults appropriate to your data center. The information on these job statements will be automatically supplied each time you submit a batch job from MICF. You will have the opportunity to edit your job statement at execution time, as long as YES is specified for the parameter, "Execution Mode - Display execution mode before executing inquiry." This parameter is also included on the MICF Parameter Update panel for the user profile parameters.

If you want to change the entries on your default job statement, enter the new entry after the arrow prompt on Job Card 1, Job Card 2, Job Card 3, or Job Card 4. When you leave this panel by pressing END (usually your PF3 key), the information you changed will be saved. If you make a mistake and do not want to save your changes, type CANCEL in the Command area at the top of your screen.

The other parameter update options all work the same way.

2.2.4 Adding Documentation to User-Written Inquiries

The MICF Inquiry Documentation facility supports inquiries written by users, as well as CA MICS distributed inquiries.

To view your own abstract and sample report output, copy them to the sharedprefix.MICS.DOC.TEXT library using the following naming conventions:

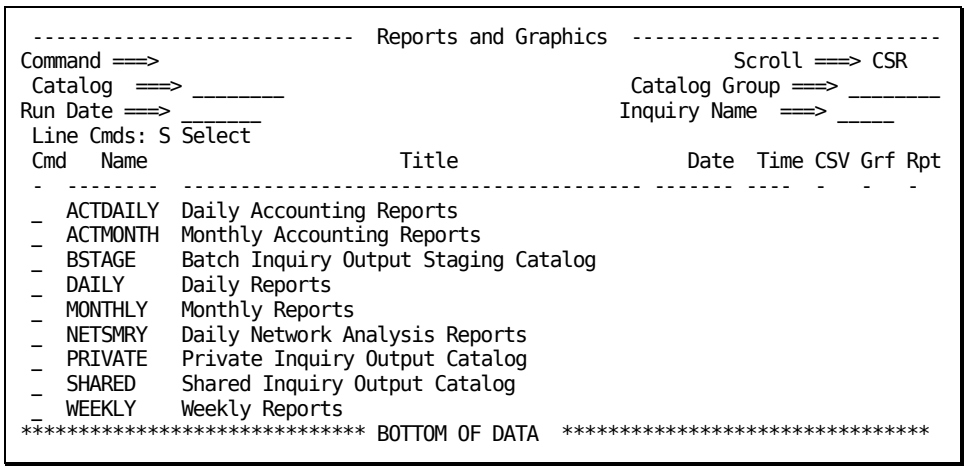
o Give the abstract the 1-6 character name of the associated MICF inquiry with the letter A appended to it.

o Give the sample report output the 1-6 character name of the associated MICF inquiry with the letter S appended to it and optional numbers 1 through 9.

If your inquiry produces multiple reports, you can include all the sample output in one member ending in the letter S, or you can create up to nine separate members, ending in S1 through S9, with a separate report in each member. All the sample reports will be displayed in numerical order.

For example, MICF inquiry RMFLD9 could generate two reports. The abstract would be written to the sharedprefix.MICS.DOC.TEXT library as member RMFLD9A. The sample reports could be stored in the same library as members RMFLD9S1 and RMFLD9S2. You would use the V line command to concatenate the members and display them all together.

2.3 Replaying Cataloged Output



```
 ---------------------------  Reports and Graphics  --------------------------
Command ===>                                                Scroll ===> CSR
 Catalog  ===> ________                                Catalog Group ===> ________
Run Date ===> _______                                 Inquiry Name  ===> _____
 Line Cmds: S Select
 Cmd   Name                      Title                     Date  Time CSV Grf Rpt
 -  --------  ---------------------------------------- ------- ----  -   -   -
 _  ACTDAILY  Daily Accounting Reports
 _  ACTMONTH  Monthly Accounting Reports
 _  BSTAGE    Batch Inquiry Output Staging Catalog
 _  DAILY     Daily Reports
 _  MONTHLY   Monthly Reports
 _  NETSMRY   Daily Network Analysis Reports
 _  PRIVATE   Private Inquiry Output Catalog
 _  SHARED    Shared Inquiry Output Catalog
 _  WEEKLY    Weekly Reports
****************************** BOTTOM OF DATA  *********************************
```

Figure 2-13. Sample Reports and Graphics Panel

This section shows you how to find and replay existing MICF inquiry output that was previously generated and cataloged by yourself, by other CA MICS users, or by CA MICS production reporting jobs. This output includes color graphics reports, standard (printed) reports, MICSLOG, SAS log, and (if generated), CSV file output.

You have access to:

- Reports, graphics and CSV File output from CA MICS production reporting, though access to some reports may be limited by your data center's security procedures.
- Outputs you saved from the inquiries you executed.
- Other inquiry outputs the CA MICS administrator has made available to all users.

You can replay color graphics, browse printed reports, browse the MICSLOG and SAS log, and view CSV file output from an inquiry execution. Print inquiry output options let you route color graphics to a hardcopy graphics device and print reports and logs. You can also delete inquiry outputs you previously saved.

To replay the output of a MICF inquiry, select Option 1, Reports and Graphics, from the primary MICF menu. You will see a Reports and Graphics panel similar to the one shown in Figure 2-13. (Actual panel specifications are site-dependent.)

The Reports and Graphics panel lists the inquiry output catalogs defined for your data center. The list of available inquiry output catalogs may differ, but the use of the panel will be the same. You can review saved reports and graphics by selecting an inquiry output catalog and then selecting the inquiry output you want to review.

A single inquiry can produce several outputs (for example, a printed list, a statistical report, and one or more color graphics). Requesting a replay of an inquiry's output gives you access to all of the output that is produced.

The procedures for online inquiry output review are discussed in the following sections:

1 - Selecting the catalog

2 - Selecting the inquiry output from the catalog

3 - Browsing the inquiry output

4 - Printing the inquiry output

5 - Deleting cataloged output

6 - Moving batch staging catalog entries

2.3.1 Selecting the Catalog

You can select the inquiry output catalog for reviewing inquiry output by entering the 1-8 character catalog name in the data entry field at the top of the panel (see Figure 2-13) or you can use the S (select) line command to select an output catalog from the display. MICF remembers the catalog you select and will automatically select the same catalog the next time you enter the Reports and Graphics MICF option. You can change catalogs by entering the new catalog name in the catalog data entry field or by blanking out the catalog data entry field and selecting the new catalog from the Reports and Graphics display.

MICF provides five types of inquiry output catalogs:
PRIVATE INQUIRY OUTPUT CATALOG

MICF maintains a PRIVATE inquiry output catalog for each user. After you execute a MICF inquiry, you have the option to save (that is, catalog) inquiry output in your PRIVATE catalog. You can use the Private Inquiry Output Catalog display to do one or more of the following:

o replay (that is, browse reports, replay color graphics, or view CSV file output)

o print (that is, print reports or replay color graphics to a hardcopy device)

o delete inquiry output you save

Color graphics, printed reports, MICSLOG, SAS log, and any CSV file output is saved until you delete the inquiry output from the catalog.

The PRIVATE catalog is keyed by inquiry name and execution date/time, so the catalog can contain multiple versions (or executions) of an inquiry.

The PRIVATE catalog consists of the following:

- The userid.MICS.USER.TABLES(ICFOCTL) ISPF table
- Printed report, MICSLOG, and SAS log members in userid.MICS.USER.OUTPUT
- Color graphics SAS/GRAPH GREPLAY catalogs in userid.MICS.USER.DATA
- CSV file output in userid.MICS.USER.DTFOUT

See MICF Options in the MICF Reference Guide for data set names and other data set allocation parameters.

BATCH STAGING INQUIRY OUTPUT CATALOG

MICF maintains a BSTAGE inquiry output catalog for each user. Before executing a MICF inquiry in batch mode, you have the option to save inquiry output for online review. Output from batch inquiry executions are saved in your Batch Staging Inquiry Output Catalog. You can replay color graphics, and browse printed reports, MICSLOG, the SAS log, and any CSV file output from your batch staging catalog. You can move inquiry output from your batch staging catalog to your private inquiry output catalog. You can also delete batch staging catalog entries. You can save multiple versions (or executions) of a given inquiry. The BSTAGE catalog is keyed by inquiry name and execution date/time.

The BSTAGE catalog consists of the userid.MICS.USER.TABLES(ICFBCTL) ISPF table and a unique OS data set for each inquiry output. An inquiry with both printed reports and color graphics output will create four data sets (color graphics catalog, printed reports, CA MICS log, and SAS log) for each saved execution. MICF automatically deletes empty data sets (for example, the printed report data set is deleted if the inquiry does not produce reports). See MICF Options in the MICF Reference Guide for data set names and other data set allocation parameters.

SHARED INQUIRY OUTPUT CATALOG

MICF maintains a single SHARED inquiry output catalog that can be accessed by all users. The CA MICS administrator (or other authorized user) can copy inquiry output from any user's PRIVATE inquiry output catalog to the SHARED catalog. You, or any other user, can use the Shared Inquiry Output Catalog display to replay (that is, browse reports and replay color graphics) or print (that is, print reports and replay color graphics to a hardcopy device) shared inquiry output. Color graphics, printed reports, MICSLOG, and the SAS log are saved until the CA MICS administrator deletes the inquiry output from the catalog. The SHARED catalog is keyed by inquiry name and catalog date/time, so the catalog can contain multiple versions (or executions) of an inquiry.

Note: Inquiries that created CSV file output can be copied to the shared output catalog, however an ISPF pop-up message will be issued stating the CSV file output will not be copied. The reason for this is typically CSV file output is used to create additional reports or download to the CA MICS Q&R workstation product, and not simply viewed by the general user community.

The SHARED catalog consists of the following:

- The sharedprefix.MICS.ISPTLIB(ICFOCTS) ISPF table
- Printed report, MICSLOG, and SAS log members in sharedprefix.MICS.MWFPDS.DATA
- Color graphics SAS/GRAPH GREPLAY catalogs in sharedprefix.MICS.MWFSAS.DATA

PRODUCTION CATALOGS

Production (or user-group) catalogs extend the inquiry output catalog concept to support regularly scheduled, production reporting and unique, user-group shared reporting requirements. Each production catalog contains reports, graphics, and any CSV file output from MICF inquiries that were executed and cataloged as a logical unit (for example, Daily Reports and Weekly Reports). You can use the production catalog displays to replay (that is, browse reports, replay color graphics and view CSV file output) or print (that is, print reports and replay color graphics to a hardcopy device) inquiry output.

Note: Your data center can restrict access to certain production catalogs. A security exception will occur if you try to access reports and graphics you are not authorized to view.

Reports and graphics are grouped by execution date/time (or cycle). For example, you can review yesterday's reports, or you can select reports from two days ago or last week. Within each run date (or cycle), you select reports and graphics by inquiry name (just like the SHARED or PRIVATE catalogs). The number of versions (or cycles) of color graphics, printed reports, MICSLOG, the SAS log and any CSV file output retained is uniquely defined for each production catalog.

USER REPORTING CATALOGS

Each User Reporting catalog contains reports, graphics, and CSV output from MICF inquiries that were executed and cataloged as a logical unit. You can use the user reporting catalog displays to replay (browse reports or CSV output and/or replay color graphics) or print (print reports and/or replay color graphics to a hardcopy device) inquiry output.

User Reporting catalogs differ from production catalogs in that they are only accessible to the author. That is, only the user that defined the user reporting job stream will see the user reporting catalog displayed in MICF Output Retrieval as they are stored in the user's private MICF tables library.

User Reporting job output is grouped by execution date/time (or cycle), just as they are for production catalogs. Within each run date (or cycle), you select reports and graphics by inquiry name (just like the SHARED or PRIVATE catalogs). The number of versions (or cycles) of color graphics, printed reports, MICSLOG, and SAS log retained is uniquely defined for each User Reporting catalog.

2.3.2 Selecting the Inquiry Output from the Catalog

```
------------------  Daily Mgmt. by Objective Reports (MBO)  ------------------
Command ===>                                                  Scroll ===> CSR
 Catalog  ===> DAILYMBO                                Catalog Group ===> ________
Run Date ===> _______                                 Inquiry Name  ===> _____
 Line Cmds: S Select
 Cmd   Name                    Title                      Date   Time CSV Grf Rpt
 -  -------- ----------------------------------------  -------- ----- -   -   -
 _  26FEB06  February 26, 2006                        06/02/26 01:32
 _  27FEB06  February 27, 2006                        06/02/27 01:15
 _  28FEB06  February 28, 2006                        06/02/28 02:06
 _  29JUN06  June 29, 2006                            06/06/29 00:49
 _  30JUN06  June 29, 2006                            06/06/30 01:48
 _  31MAR06  March 31, 2006                           06/03/31 01:22
 _  01SEP06  September 01,2006                        06/09/01 02:15
 _  02SEP06  September 02, 2006                       06/09/02 01:42
****************************** BOTTOM OF DATA  *******************************
```

Figure 2-14. Sample Production Catalog Display

To select the output from the catalog, you must first find the name of the inquiry that created the output you want to replay. In addition, if you are reviewing output from a production or user reporting catalog, you must select the run date/time group (or cycle) containing the output you want. Once you have selected the cycle, the inquiries will be presented in either Alphabetical or Execution order, depending on what you have specified in your MICF User Profile Options for the default display order.

Figure 2-14 shows a sample production inquiry output catalog display. The contents of this display vary depending on the specifications entered in the data entry fields at the top of the panel. The Catalog parameter shows the 1-8 character name of the production reports and graphics catalog you are currently displaying. The catalog title (or long name) is shown in the panel title area (that is, at the top of the panel). Use the Run Date, Catalog Group, and Inquiry Name parameters to specify a part of the catalog to be displayed.

A catalog structure is provided to simplify inquiry output retrieval. Inquiry outputs are stored by run date/time (or cycle) and also in "groups" of related inquiries. This panel can display:

- Catalog cycles -- a list of the run date/time groups (or cycles).
- Catalog groups -- a list of the logical groups of inquiries (catalog groups) for the selected run date (or cycle).
- Inquiries -- a list of the inquiries cataloged under a specific catalog group for the selected run date (or cycle).

To review inquiry outputs, you must first select Run Date. When Run Date is blank, you can use the Select (S) command to select an entry (or cycle) from the display or you can specify a number to select reports and graphics based on relative execution date/time (or cycle). Here are some examples:

- Specify 1 (or select the first entry from the display) for the most recent reports and graphics (for example, yesterday or last week). This is called a relative cycle number.
- Specify a date in ddmonyy format (for example, 10OCT00 for October 10, 2000) to review outputs cataloged on that date.
- Specify a 3-character month abbreviation (for example, OCT or JUL) to review all outputs for a specific month.
- Specify * (asterisk) to review all outputs in the current production or user reporting catalog.

o Specify 0* for all dates beginning with 0 like 01OCT00 or
  02OCT00.

When the RETURN command is used to exit Reports and Graphics, MICF remembers your run date specification. Provided that your run date specification was either a relative cycle number or was chosen with the S line command, the next time you enter the Reports and Graphics option MICF automatically selects the same relative cycle. For example, if you select the first entry from the cycle display to review the most recent daily reports, MICF automatically selects the most recent daily reports the next time you enter the Reports and Graphics option.

If you entered an asterisk as the run date, the next time you enter the Reports and Graphics option MICF automatically shows you all outputs in the current catalog.

```
----------------------  Shared Inquiry Output Catalog  ----------------------
Command ===>                                                Scroll ===> CSR
 Catalog  ===> SHARED                                Catalog Group ===> GENERAL
Run Date ===> _______                               Inquiry Name  ===> _____
 Line Cmds: S Select
 Cmd    Name                    Title                      Date   Time  Grf Rpt
 -   --------  ---------------------------------------  -------- -----  -   -
 _   CHARGE    DP Charges by Costcenter Audit           00/10/21 15:17  N   Y
 _   DLYTSO    Daily TSO Performance Analysis           00/10/29 08:12  Y   N
 _   DLYTSO    Daily TSO Performance Analysis           00/10/28 08:10  Y   N
 _   DLYTSO    Daily TSO Performance Analysis           00/10/25 17:32  Y   N
 _   ENGPGM    Engineering Program Analysis             00/10/23 11:12  Y   Y
 _   EXCEPT    CA MICS Exceptions Review                00/10/11 10:02  N   Y
 _   PRINT     Printer Utilization Analysis             00/10/02 11:15  N   Y
****************************** BOTTOM OF DATA  *********************************
```

Figure 2-15. Sample Shared Inquiry Output Catalog Display

To help you find the inquiry name you want in the catalog, each inquiry output catalog is also divided into catalog groups. When you select a production or user reporting catalog cycle or when you select the shared, private, or batch staging inquiry output catalog, you will see a list of the catalog groups that are available.

You can either type in the name of the catalog group you want to see after the Catalog Group prompt, or you can select the group by entering S next to the group name in the Cmd column. Once you have done so, the catalog group name is shown after the Catalog Group prompt and the entries in the table at the bottom of the screen are all the inquiry outputs contained in that group. To see the list of all inquiry outputs in the catalog (or production or user reporting catalog cycle), enter an asterisk (*) after the Catalog Group prompt. To see the list of all inquiries in all catalog groups starting with the same sequence of characters, code that sequence followed by an asterisk after the Catalog Group prompt. Here is an example:

```
Catalog Group ===> S*
```

This shows you the inquiry outputs in all catalog groups starting with S. Thus if the catalog contains catalog groups named AVAIL, CAPACITY, FINANCE, SECURITY, SERVICE, and STANDARD, you would see the list of inquiry outputs for the catalog groups SECURITY, SERVICE, and STANDARD.

Figure 2-15 illustrates a sample shared inquiry output catalog display for the GENERAL catalog group. You will see a similar display when you select run date and catalog group for a production or user reporting catalog.

If the list of inquiries is long, you can scroll through it using the standard ISPF DOWN and UP commands. You can narrow down the list by entering the beginning characters of the names you are interested in after the Inquiry Name prompt. Only inquiries with names starting with these characters will be shown.

Regardless of your MICF User Profile - Reporting Job Stream Default Display Order, you can still sort the display into either order. For Alphabetical order by inquiry name, use the primary command SORT and sort on column 1. To sort the display by execution order, enter the primary command SORT and sort on column 8. For example, enter, SORT 8. Execution order (column 8) is a non-displayed column, but can still be used for sorting the display.

The information about each inquiry is displayed on a single line. The information includes the inquiry name, the inquiry title, the date and time the inquiry was executed, and whether or not the output includes CSV file output (CSV), graphics displays (Grf) or printed reports (Rpt). Since the same inquiry can be executed multiple times against different data sources, it is quite possible to see multiple entries for the same inquiry. This condition should occur only when the date or run times differ.

You can select the inquiry output you want to view from this list by entering S next to the inquiry's name in the Cmd column.

You then see the Inquiry Output Replay panel. The use of this panel is discussed in the next two sections.

2.3.3 Browsing the Inquiry Output

```
---------------------------  Inquiry Output Replay  ---------------------------
Option ===>
 Replaying CA MICS Inquiry: CICPM3 - Monthly CICS Availability Report
   Output Cataloged on:  06/09/01 at 10:19
   Output Cataloged in:  DAILYMBO - DAILYMBO Inquiry Output Catalog
 Override Color Graphics Parameters ===> N (Y/N) Graphics Device:   TEK4106
                                                 Background Color:

         1 - Replay Color Graphics            **** Graphics Available ****
             Display color graphics generated by the inquiry (Uses PROC GREPLAY)
        2 - Browse Report                     **** Report Available ****
             Display the report generated by the inquiry (uses ISPF/PDF Browse).
        3 - Browse MICSLOG
             Display the MICSLOG for the inquiry (uses ISPF/PDF Browse).
        4 - Browse SAS Log
             Display the SAS log for the inquiry (uses ISPF/PDF Browse).
        5 - Print Inquiry Output
             Print the report, MICSLOG, and SAS log; and/or replay color
             graphics (if any) to a hardcopy device (uses PROC GREPLAY).
        6 - View CSV file                     **** CSV Available ****
             Display the CSV file (if any) generated by the inquiry.
             (uses ISPF/PDF View)

------------------------------------------------------------------------------
```

Figure 2-16. Inquiry output Replay Panel

After you select an inquiry from the catalog, you will see the Inquiry Output Replay panel (Figure 2-16).

This panel offers you five ways to replay the output of a cataloged inquiry: replaying color graphics produced by the inquiry, browsing the report generated by the inquiry, browsing the MICSLOG for the inquiry, browsing the SAS log that documents the inquiry, viewing any CSV file output, and printing the inquiry output.

Option 1 lets you display color graphics output. If you plan to display your output at a color graphics terminal, be sure that the entry after the Graphics Device prompt on line seven of this panel correctly identifies your terminal. If you are not using a color graphics terminal, do not attempt to use Option 1. Sending graphics characters to a nongraphics device can produce unpredictable results. If you are not using a color graphics terminal, you do not need to respond to the Graphics Device prompt. Once you select Option 1, you will see a list of graphics that were created by the MICF inquiry. When you select one of these by entering S to the left of the graphic's name, the graphic will appear on your screen. Note that the Inquiry Output Replay panel (Figure 2-16) shows you whether there are any color graphics in the output from the inquiry. If there are one or more graphics in the output, this comment is placed to the right of the menu prompt:

**** Graphics Available ****

Instead of replaying the graphics output on your screen, you can reply Y to the Override Color Graphics Parameters prompt. This will take you to the Color Graphics Device Parameter panel.

MICF provides defaults for all of the parameters on the Color Graphics Device Parameter panel. If you override the defaults using this panel, your changes will apply only to the current output replay request.

When you are on the Color Graphics Device Parameters panel, you can change the name of the color graphics device to any of the devices for which SAS/GRAPH has device drivers. You can also specify any GOPTIONS parameters whose defaults you want to change. (We recommend that you review the advice in the SAS/GRAPH manual before overriding these defaults.)

An additional parameter that you can change on the Color Graphics Device Parameters panel is Background Color. This parameter is useful when previewing graphics online prior to routing them to a hardcopy device. For example, a white background enables the terminal to simulate the appearance of the hardcopy device with black text on a white background.

Note: Use this option with care as an invalid color specification will cause the graphics replay to fail.

Selecting Option 2, Browse Report, displays the report generated by the inquiry. You can move through this report using the same commands as you would use with ISPF BROWSE. The report consists of the non-graphics portions of the output from the inquiry. Note that the Inquiry Output Replay panel (Figure 2-16) shows you whether there are any printed reports in the output from the inquiry. If there are one or more printed reports in the output, this comment is placed to the right of the menu prompt:

**** Report Available ****

Selecting Option 3, Browse MICSLOG, displays the MICSLOG that was produced by MICF. The MICSLOG contains information, warnings, and error messages relating to inquiry execution.

Selecting Option 4, Browse SAS Log, displays the SAS log that was produced by MICF. This log contains a copy of the SAS statements that MICF generated when the inquiry was created along with messages from SAS. If you have any questions about the data sources or data manipulation, you should be able to find the answers here. If you are not an experienced SAS programmer and are having difficulties, show this log to someone who is familiar with SAS.

Selecting Option 6, View CSV File, displays the CSV file generated by the inquiry. You can use the same commands as you would use with ISPF VIEW, which enables you to "create" a copy of this file under your own (non-MICF catalog) control, as well as using display tailoring commands such as ONLY or EXCLUDE.

Note that the Inquiry Output Replay panel (Figure 2-16) shows you whether there are any CSV files available from the inquiry. If there are one or more CSV files in the output, this comment is placed to the right of the menu prompt:

```
****  CSV Available   ****
```

2.3.4 Printing the Inquiry Output

```
--------------------------  Print Inquiry Output  ---------------------------
Option ===>
 Replaying CA MICS Inquiry: TSOCD3 - Daily TSO Availability Report
   Output Cataloged on:  00/12/14 at 08:07
         1 - Print Output With Batch Job
        2 - Print Output With Direct Sysout
        3 - Print Output to Local 3270 Printer
        4 - Replay Color Graphics With Batch Job
        5 - Replay Color Graphics to Hardcopy Device
 -------  For Report and Log  -------  ---------  For Color Graphics  ---------
Print         ===> ALL (ALL/RPT/LOG)  Override Device Parameters ===> N (Y/N)
Sysout Class  ===> A  Form ===> ____  Color Graphics Device:          ZETA8
Destination   ===> ________________   Background Color:
Sysout Writer ===> ________
Sysout Parms. ===> ____________________________________________________________
Local Printer ===> ________  Opt. ===> ________________________________________
-----------------------  Batch Job Card Information  -------------------------
   ===> //jobname JOB (accounting data),NOTIFY=userid,
   ===> // 'MICF JOB',MSGLEVEL=(1,1),MSGCLASS=A,TIME=(,30)
   ===> //
   ===> //
-------------------------------------------------------------------------------
```

Figure 2-17. Sample Print Inquiry Output Panel

Option 5, Print Inquiry Output, takes you to the panel shown in Figure 2-17. Use the Print Inquiry Output menu to route inquiry outputs to hardcopy devices. You can replay color graphics to a hardcopy graphics device, print reports, and print MICSLOG and the SAS log. You can generate hardcopy outputs through direct allocation of JES sysout data sets, by submitting a batch job, or by using the DSPRINT service (reports, MICSLOG, and the SAS log only).

The five options on this menu (and associated data entry fields) are described in the sections that follow. The Print parameter is required for options 1, 2, and 3 and is ignored for options 4 and 5. Specify ALL to print reports, MICSLOG, and SAS log. Specify RPT to print only the reports. Specify LOG to print only the MICSLOG and SAS log.

2.3.4.1 Printing Output with Batch Job

To print your output with a batch job, check that the entries for Sysout Class, Form, Destination, Sysout Writer, and Sysout Parms are correct.

- Sysout Class -- Sysout Class is a required entry. It is the JES sysout class for printing your output. It should be a letter between A and Z, a number from 0 to 9, or an asterisk (*).

- Form -- Form is an optional entry. It is the JES sysout form number for printing your output.

- Destination -- Destination is an optional entry. It is the JES sysout destination or printer name for printing your output. Specify LOCAL for printing on a local (that is, non-RJE printer). Specify the remote name (for example, REMOTE12) for printing on a JES RJE printer. Leave this parameter blank to accept the default established for your TSO logon-ID. You can use the optional (node,userid) format to route output to a VM/CMS user through JES and RSCS facilities. Node and userid are 1-8 character names. Node is required for this destination parameter format. If your (node,userid) format destination is longer than the data entry field, leave this parameter blank and specify DEST=(node,userid) in the free-form sysout parameters data entry area below.

- Sysout Writer -- Sysout Writer is an optional entry. It is the name of the external writer task that will process this output. If this information is required, the default has probably been specified by your system administrator. See your system administrator or systems programmer if you need assistance in selecting the Sysout Writer name.

- Sysout Parms. -- Sysout Parms is an optional entry. This data entry field contains additional JES sysout parameters your installation requires for sysout data set allocations (for example, CHARS, COPIES, FCB, FLASH, HOLD, UCS). Specify these parameters in JCL statement format, separated by commas. See your system administrator or systems programmer if you need assistance in specifying the Sysout Parms.

At the bottom of the panel is an area labeled Batch Job Card Information. MICF will put your default job card here. You can make changes or additions to your job card while on this panel. The remaining entries on the panel do not apply to printing with a batch job.

After you are satisfied with the entries on the panel, type the number 1 after the Option prompt and press ENTER. MICF will generate and submit a batch job to print both the report and the SAS log using the IEBGENER utility program. If the "Batch Execution - Display generated jobstream before submitting jobs (YES/NO)?" user profile parameter is set to YES, then you will have an opportunity to review and change the generated batch job before the job is submitted for batch execution.

2.3.4.2 Printing Output with Direct Sysout

To print your output with a direct sysout, check that the entries for Sysout Class, Form, Destination, Sysout Writer, and Sysout Parms are correct. Sysout Class is required and must be a letter between A and Z or a number between 0 and 9. SYSOUT=* is not valid for dynammic allocation and cannot be specified for the direct sysout option. Form, Destination, Sysout Writer, and Sysout Parms are optional and have the same meaning as they do for printing with a batch job.

After you are satisfied with the entries on the panel, type the number 2 after the Option prompt and press ENTER. MICF will allocate a JES "spin" data set containing the report and SAS log. This data set will be associated with your TSO session and will be printed according to your data center's standard procedures.

2.3.4.3 Printing Output to Local 3270 Printer

To print your output to a local 3270 printer, specify the printer after the Local 3270 Printer prompt; type the number 3 after the Option prompt and press ENTER. The report and SAS log will print using the DSPRINT service. If your installation requires that you specify DSPRINT command options (for example, EJECT), then specify these options following the Opt prompt before you press ENTER.

2.3.4.4 Replaying Color Graphics with Batch Job

Replaying color graphics with a batch job can be either simple or complicated, depending on your data center's color graphics devices and procedures. To replay color graphics with a batch job you must do the following:

- Specify the color graphics device.
- Provide MICF with appropriate device parameters.
- Provide MICF with appropriate job card information.
- Enter 4 after the Option prompt and press ENTER.

When you have completed these steps, MICF creates and submits a batch job using SAS/GRAPH PROC GREPLAY. Color graphics output is sent to the specified graphics output device. (Note that the remaining entries on the Print Inquiry Output panel do not apply to replaying color graphics with a batch job.)

If your data center has only one type of color graphics printer or plotter, you probably will not need to change the color graphics device name or the device parameters. The defaults established by your CA MICS administrator will probably work for your jobs. If this is the case, all you will need to do before entering 4 after the Option prompt is to verify (and correct if necessary) the job card information at the bottom of the Print Inquiry Panel.

If your data center has two types of color graphics devices, you probably will not need to change the color graphics device name or the device parameters. In this situation, your system administrator will probably have established one device type (such as the IBM 3279 terminal) as the default for inquiries executed in the foreground (that is, interactively) and the second device type (such as a ZETA8 pen plotter or an IBM 3287 color printer) as the default for inquiries executed in batch. If this is the case, all you will need to do before entering 4 after the Option prompt is to verify (and correct if, necessary) the job card information at the bottom of the Print Inquiry Panel. The print inquiry output process uses the default specifications established for batch inquiry execution (ZETA8 in this example).

If your data center has a variety of color graphics devices, your task will be more complicated. Each device has its own set of required parameters, which you must specify. Check the color graphics device parameters by replying Y to the prompt Override Device Parameters. These parameters define device characteristics such as color list and protocol. Subordinate panels let you supply free-form coding to specify any needed device-specific parameters.

2.3.4.5 Replaying Color Graphics to Hardcopy Device

To replay color graphics to a hardcopy device interactively, complete the color graphics device and device parameter information the same way you would for printing color graphics with a batch job. Then enter 5 after the Option prompt.

If you are using a graphics terminal, you may find it useful to specify your terminal as the output device. If you do, you will see the graphics in a stream without the intervening menus.

2.3.5 Deleting Cataloged Output

You can delete an output from your private or batch staging catalog by typing D in the Cmd column next to the inquiry name. Only the system administrator can delete output from the shared catalog.

2.3.6 Moving Batch Staging Catalog Entries

You can move an inquiry output (color graphics, printed reports, MICSLOG, the SAS log and CSV file output) from your batch staging inquiry output catalog to your private inquiry output catalog by entering M in the Cmd column next to the inquiry name. M (move) copies the selected inquiry outputs to your private inquiry output catalog and then deletes the inquiry output from your batch staging inquiry output catalog.

2.4 Executing Cataloged Inquiries

This section shows you how to execute (run) inquiries that the CA MICS administrator has stored in the shared MICF catalog, or that you have saved in your private MICF catalog. Sections 2.5 and 2.6 show you how to create, save, and modify inquiries.

To execute a cataloged inquiry, you must do both:

1 - Select an inquiry from the catalog.

2 - Select the inquiry execution options.

Each of these tasks is described below.

2.4.1 Selecting an Inquiry from the Catalog

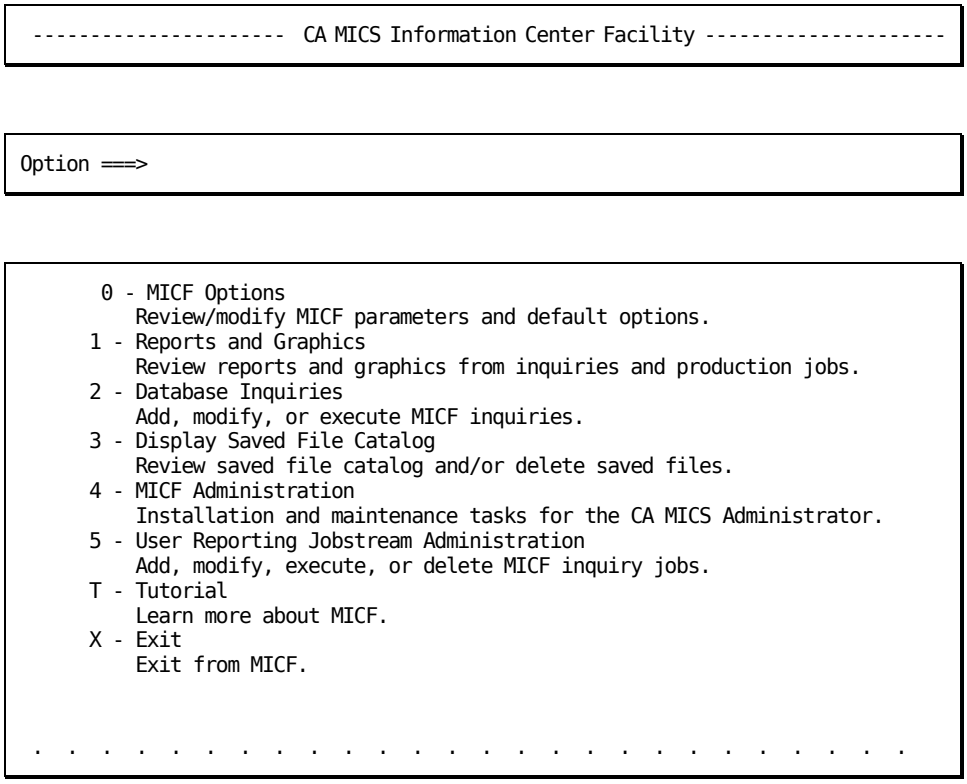


Figure 2-18. Selecting the Database Inquiries Option from the Primary Menu

To reach the MICF inquiry catalog, select Option 2, Database Inquiries, from the primary MICF menu.

You now see the Database Inquiries panel, which will look much like the one shown in Figure 2-19. The list of available inquiries can differ, but the use of the catalog will be the same.

```
---------------------------  Database Inquiries  ----------------------------
 Command ===>                                                Scroll ===> PAGE

 Catalog     ===> SHARED  (PRIVATE/SHARED)  Catalog Group         ===> AVAIL
 Create New Inquiry ===> ______     (Name)  Name (subset display) ===> ________

 Line Cmds: A Abstract V View Sample E Execute  B Batch    F Foreground
            S Select   M Modify      C Copy     R Repeat   D Delete

 Cmd    Name                    Title                        Date     Time
  -   --------  ---------------------------------------  ---------  -----
  _    CICCD3    Daily CICS Availability Report           06/06/27   13:08
  _    CICCM3    Monthly CICS Availability Report         06/06/27   13:09
  _    CICCW3    Weekly CICS Availability Report          06/06/27   13:09
  _    CICPD3    Daily CICS Availability Report           06/06/27   13:09
  _    CICPM3    Monthly CICS Availability Report         06/06/27   13:10
  _    CICPW3    Weekly CICS Availability Report          06/06/27   13:10
  _    IMSCM3    Monthly IMS Availability Report          06/06/27   13:09
  _    IMSPM3    Monthly IMS Availability Report          06/06/27   13:10
  _    TSOCD3    Daily TSO Availability Report            06/06/27   13:09
  _    TSOCM3    Monthly TSO Availability Report          06/06/27   13:09
  _    TSOCW3    Weekly TSO Availability Report           06/06/27   13:09
  _    TSOPD3    Daily TSO Availability Report            06/06/27   13:10
  _    TSOPM3    Monthly TSO Availability Report          06/06/27   13:10
  _    TSOPW3    Weekly TSO Availability Report           06/06/27   13:10
 ------------------------------------------------------------------------------
```

Figure 2-19. Sample Database Inquiries Panel

Note that the Database Inquiries panel is much like the Inquiry Output Replay panel. You select either the private or shared catalog and the catalog group the same way that you do for Inquiry Output Replay. Display subsetting, inquiry selection, and inquiry deletion also work the same way as for Inquiry Output Replay. You will not need to use insert, repeat, and copy until you begin modifying inquiries (see section 2.5).

Note that the Abstract (A) and View Sample (V) line commands can be used to display information about a particular inquiry and view a sample of its output so you can decide which inquiry to run.

See section 2.2.4 for information on adding abstracts and sample output for your own user-written inquiries.

To execute an inquiry, either enter an E in the Cmd column next to the name of the inquiry, or you can at the same time select the execution method, either Batch or Foreground by entering a B or F respectively in the Cmd column. If you were to execute inquiry TSOPW3, the Weekly TSO Availability Report, you would see the MICF Execution panel shown in Figure 2-20.

```
------------------------------  MICF Execution  ------------------------------
```

```
Command ===>
```

```
Executing CA MICS Inquiry: TSOPW3 - Weekly TSO Availability Report



Inquiry Execution Mode     ===> BATCH      (BATCH/FOREGROUND)
Override Execution Options ===> N          (Y/N)

Press ENTER to execute the inquiry, or press END to cancel execution.

----------------------  Batch Job Submission Parameters  ----------------------
Edit Generated Jobstream ===> Y (Y/N)  Hold Inq. Output for Replay ===> Y (Y/N)

SYSOUT Class  ===> A                              SYSOUT Form   ===> ____
Destination   ===> ________________               SYSOUT Writer ===> ________
SYSOUT Parms. ===> ____________________________________________________________

Job Card Information:
  ===> //MICFINQ  JOB (XXXXXXX,XXXXXXX,X),'MICF USER',MSGLEVEL=(1,1),
  ===> //  CLASS=A,MSGCLASS=A
  ===> //*
  ===> //*
```

```
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Figure 2-20. CA MICS Database Inquiry Execution Panel

Note that the fourth line of the panel identifies the inquiry that you are about to execute. If you do not want to execute this inquiry, cancel the execution by typing END after the Command prompt or by pressing your END key.

2.4.2 Selecting the Inquiry Execution Options

You have several choices to make on the MICF Execution panel before pressing ENTER to execute the inquiry:

1 - Which execution mode (batch or foreground) to use.

2 - Whether to override the default execution options.

3 - Whether to override the default job control specifications (applies in batch mode only).

4 - Whether to hold batch inquiry outputs for later online review.

Note: If the inquiry creates a CSV file, the "Hold Inq. Output/Save CSV" setting must be Y in order to generate the CSV file.

A sixth option occurs after you press ENTER:

6 - Whether to override the default data selection options for inquiries with execution-time data selection.

Each of these choices is discussed separately below.

2.4.2.1 Selecting the Execution Mode

There are two possible execution modes, which you can select by entering B or F after the Inquiry Execution Mode prompt:

- In batch mode, MICF creates and submits a batch job that executes the inquiry.

- In foreground mode, MICF executes the inquiry interactively and lets you review the results immediately.

Each of these is explained in more detail here. Below the detailed explanations is a table that compares the features of each type of execution.

If you select batch, a batch job is generated and submitted to execute the inquiry. You have the option to hold outputs (that is, color graphics, printed reports, MICSLOG, the SAS log, and any CSV file output) for later online review (and printing). Or you can let the batch job print reports, MICSLOG, and the SAS log according to your sysout specifications. In either case, MICF can display color graphics on the hardcopy graphics device you specify.

If you select foreground, the inquiry will execute interactively and will return you either to the inquiry's report, SAS log, or to the Inquiry Output Replay menu. MICF will return you to the Inquiry Output Replay menu whenever the inquiry generates color graphics or when the inquiry generates no report at all. If inquiry execution fails (for example, SAS detects a syntax error), you will see the inquiry's SAS log. The replay menu is identical to the Cataloged Inquiry Output Replay menu except that it contains one additional option, number 6, Catalog Inquiry Output.

Note: If you wish to view any generated CSV file output, you must first catalog the output in your Private output catalog.

You can reach the Inquiry Output Replay menu from the inquiry's report display (and from the SAS log display or the color graphics display) by entering END. Thus you have the ability with foreground execution to browse your output online, to print it, and to save it. The disadvantage of foreground execution is that you cannot use your terminal for anything else while an inquiry is executing.

Figure 2-21 is a comparison of the features available in batch and foreground execution modes.

Feature	Batch	Foreground
Ability to catalog output	Yes	Yes
Ability to replay color graphics	Yes	Yes
Ability to print reports	Yes	Yes
Ability to print color graphics	Yes	Yes
Terminal available for use during inquiry execution	Yes	No
Ability to save intermediate files	No	Yes
Ability to input intermediate files saved by other inquiries	No	Yes
Ability to create CSV files for download to CA MICS Query and Reporting	Yes	Yes

Figure 2-21. Comparison of Execution Modes

2.4.2.2 Overriding the Default Execution Options

```
----------------------------  Execution Options  ----------------------------

Command ===>

Executing CA MICS Inquiry: TSOPW3 - Weekly TSO Availability Report

Inquiry Execution Mode:  FOREGROUND

Color Graphics Format Set ===> TERMINAL  Display Color Graphics   ===> N (Y/N)
Color Graphics Device     ===> IBM32793  Override Device Parms.   ===> N (Y/N)
Allocate prefix.PARMS to  ===> ________  Execute under MADMI      ===> N (Y/N)
                                         No. Sort Work Data Sets  ===> 3 (0-6)

List the SAS Source Code  ===> Y (Y/N)   Abend for Errors         ===> N (Y/N)
List Expanded Macros      ===> N (Y/N)   Max. No. Error Msgs.     ===> ___
Print Notes in Listing    ===> Y (Y/N)   Max No. Observations     ===> _______
Overprint Errors          ===> N (Y/N)   Translate Output to Caps ===> N (Y/N)

Page Dimensions:  Columns ===> 80       (64 - 256)
                  Lines   ===> 23       (20 - 500)

SAS Invocation Options    ===> ________________________________________

. . . . . .
```

Figure 2-22. Sample Execution Option Panel

You may not need to override the default execution options very often, but you can familiarize yourself with the available options by entering Y after the Override Execution Options prompt. The Execution Options panel (see Figure 2-22) lets you specify the color graphics format set, the color graphics device, and the SAS execution parameters for the current inquiry.

While most of the parameters that you can set on this panel are self-explanatory, more detail is provided on the Execution Options tutorial panels. You can reach these panels from the Execution Options panel by entering HELP on the command line or (usually) by pressing your PF1 key.

Note that there are two sets of execution parameters. One set is for batch job submissions. The other set is for inquiries run in foreground. These options were originally set by your system administrator, although you may have personalized them with MICF Options (option 0 on the primary MICF menu). MICF uses the set of options that corresponds to your choice of execution mode: batch or foreground.

2.4.2.3 Overriding the Default Job Control Specifications

When you instruct MICF to execute an inquiry with a batch job, MICF will automatically use your default job control specifications. These include your job statement and the sysout specifications for the printed report and the SAS log.

If you want to override the default specifications for the current inquiry execution you can do so. Batch job submission parameters and job card information can be modified while you are on the MICF Execution panel. If you want to see the generated job stream and inquiry program, and have the opportunity to edit them before job submission, reply Y to the prompt Edit Generated Jobstream Before Submitting Batch Job. After MICF generates the batch job stream, you will have one more opportunity to modify the JCL before the job is submitted.

2.4.2.4 Saving Inquiry Outputs From Batch Execution

If you specify Y (yes) following the "Hold Inq. Output/Save CSV" prompt, MICF will save inquiry outputs (that is, color graphics, printed reports, MICSLOG, and SAS log) in your private batch staging inquiry output catalog. CSVs created using CA MICS Query and Reporting or CA MICS Data Transport Facility are also saved.

You can use the MICF Reports and Graphics option to review inquiry outputs after the batch job completes execution. Specify N for the hold batch outputs parameter if you want standard batch inquiry execution with hardcopy outputs.

```
Note: If you specify N, any CSV file output will be discarded
as the output dataset is not kept.  If your inquiry generates
CSV file output, ensure this option is set to Y.

You can replay color graphics and browse printed reports,
MICSLOG, SAS log, and view CSV file output from your
batch staging catalog.  You can move inquiry outputs from
your batch staging catalog to your private inquiry output
catalog.  You can also delete batch staging catalog entries.
```

2.4.3 Execution-Time Data Selection

```
------------------------  Execution-Time Parameters  ------------------------
```

```
Command ===> end                                              Scroll ===> CSR
Press END to execute the inquiry.  Enter CANCEL to cancel inquiry execution.
```

```
Executing CA MICS Inquiry: IMSCD2 - Daily IMS Service Reports

icfe130b
--------------------------------------------------------------------------------
  Enter one or more Database IDs for the Database(s) you want to process.
I                                   - ____________________________________

  Enter range of CA MICS online file cycles or enter ARCHIVE for archive files.
01                                  - ____________________________________

  Enter the SYSID(s) to be reported or leave blank to report all systems.
____________________________________ - ____________________________________

  Enter the IMSID(s) to be reported or leave blank to report all regions.
PROD                                - ____________________________________

****************************** BOTTOM OF DATA  ********************************
```

```
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Figure 2-23. Execution-Time Parameter Panel

Some MICF inquiries are made more general by allowing you to specify information such as the range of CA MICS file cycles or the system identifier (SYSID) to be reported on at execution time. When you select such an inquiry, MICF will automatically take you to the Execution-Time Parameters panel.

Figure 2-23 is an example of such a panel after the database ID, CA MICS File Cycle, and the IMS region parameters have been entered. Note that the analyst wants MICF to report on all systems, and so has left the SYSID parameter blank. The analyst has also entered PROD for the IMS region parameter to limit the report to production IMS regions starting with PROD.

Since END has been entered in the command line, the inquiry will execute as soon as ENTER is pressed. The END PF key would have the same effect.

If you have chosen to execute the inquiry in foreground, MICF will first give you a series of messages stating that SAS is being invoked in foreground and that it is generating the source code. When the inquiry is complete, you will see the report if there is one or you will be shown the Inquiry Output Replay panel. The Inquiry Output Replay panel works in the same way as the Cataloged Inquiry Output Replay panel, which was discussed in section 2.3. The only difference is that the Inquiry Output Replay panel has an additional option, Option 6, Catalog Inquiry Output, which lets you save the inquiry report, log, and color graphics in your private inquiry output catalog.

Tip: When MICF displays the CA MICS file cycles execution-time option (like in Figure 2-23), you have the option to process the online CA MICS database or the CA MICS archive database:

- If you specify a cycle range (for example, 01 or 01 - 07), MICF will execute the inquiry against the specified online file cycles.

- If you specify ARCHIVE (or just A), MICF will execute the inquiry against the corresponding CA MICS archive (tape) file. (Remember that the archive option is valid only for batch execution. MICF does not support dynamic foreground tape drive allocation.)

MICF will allocate the most recent (that is, 0) archive generation unless you specifically request another generation (for example, you could specify ARCHIVE-2 for the -2 generation). MICF uses the archive audit tape for DETAIL or DAYS timespan CA MICS files, the weekly archive history tape for WEEKS files, and the monthly archive history tape for MONTHS files. Archive is not available for application database files (for example, the Financial Recap file, ACTRCP) or YEARS timespan files.

Note: You cannot access archive files if any CA MICS File Selection inquiry steps that allow execution-time cycle override reference files that are not archived. (An error message explains why archive access is not available.)

You should also note the CA MICS database ID execution-time option shown in Figure 2-23. You can enter a single CA MICS Unit database (DB) ID or a list of DB IDs separated with blanks. This technique lets you execute the inquiry against a single CA MICS database or concatenate data from multiple databases.

WARNING! All MICF direct and structured inquiries access CA MICS files through the MICF File Selection option and AUTOMATICALLY support the execution-time DB ID list feature. However, user-written report type MICF inquiries use the MICF File Allocation option to allocate CA MICS files and then access the CA MICS file with user-written SAS statements. User-written report inquiries support execution-time DB ID list ONLY if the user-written SAS statements will concatenate multiple CA MICS files. MICF has no way to know which user-written report inquiries can support DB ID lists, and therefore, MICF cannot stop you from entering a list of DB IDs for an inquiry that does not support DB ID lists.

The distributed CA MICS MBO Report inquiries (for example, TSOMDO or CICMMO) do NOT support execution-time DB ID lists. If you enter a list of DB IDs following the execution-time DB ID prompt for a CA MICS MBO report inquiry, the inquiry will fail with this error message: SAS DDNAME not found.

2.5 Modifying Cataloged Inquiries

This section shows you how to modify existing inquiries. In the process, you will become familiar with the two types of MICF inquiries, direct and structured, and with the major elements of an inquiry. We recommend that you familiarize yourself with the structure of MICF inquiries by performing the following steps:

- Copy an inquiry from the shared catalog to your private catalog.
- Execute the inquiry (from either the shared or private catalog).
- Modify the inquiry in your private catalog.
- Execute the modified inquiry and compare the results to the original results.

To modify an inquiry, you must be able to perform the following tasks:

1 - Copy an inquiry from the shared catalog to your private catalog.

2 - Repeat an inquiry in your private catalog.

3 - Delete an inquiry.

4 - Change an inquiry.

Each of these tasks is discussed separately below.

2.5.1 Copying an Inquiry from Shared to Private Catalog

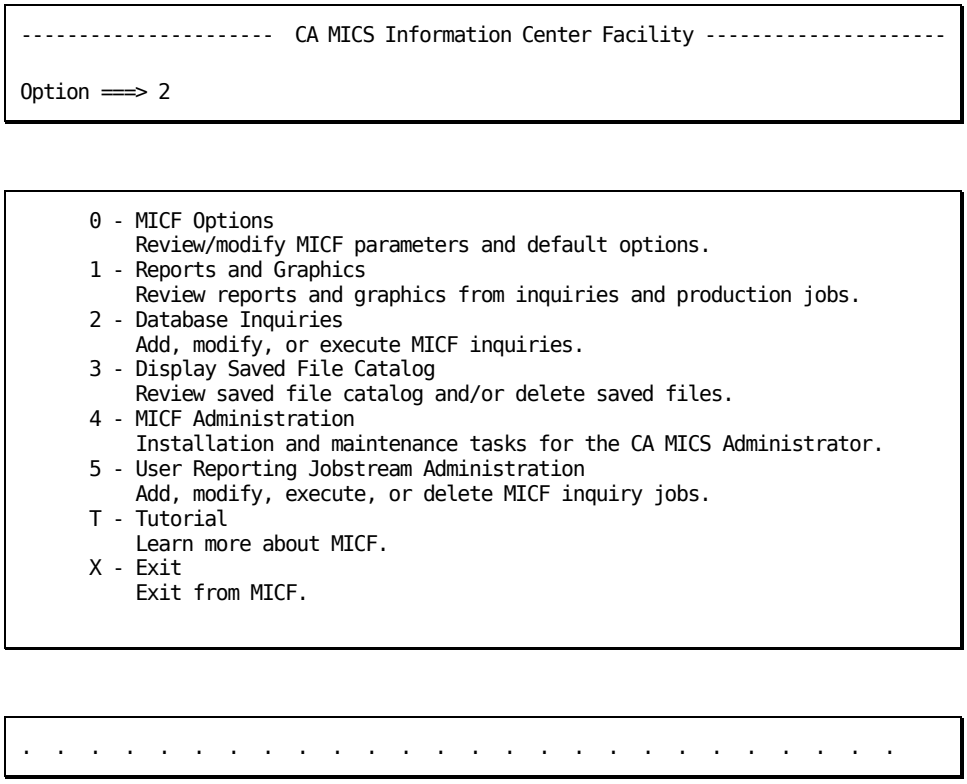


Figure 2-24. Selecting Database Inquiries from the Primary MICF Menu

Only the system administrator can modify a shared inquiry.
Everyone else has to copy the inquiry from the shared catalog
to a private catalog and modify the copy.

To copy an inquiry from the shared catalog, select option 2, Database Inquiries, from the primary MICF menu (see Figure 2-24).

```
---------------------------  Database Inquiries  ----------------------------
 Command ===>                                                Scroll ===> PAGE

 Catalog     ===> SHARED  (PRIVATE/SHARED)  Catalog Group         ===> AVAIL
 Create New Inquiry ===> ______     (Name)  Name (subset display) ===> ________


 Line Cmds: A Abstract V View Sample E Execute  B Batch    F Foreground
            S Select   M Modify      C Copy     R Repeat   D Delete

 Cmd    Name                    Title                        Date     Time
  -   --------  ---------------------------------------  ---------  -----
  _    CICCD3    Daily CICS Availability Report           06/06/27   13:08
  _    CICCM3    Monthly CICS Availability Report         06/06/27   13:09
  _    CICCW3    Weekly CICS Availability Report          06/06/27   13:09
  _    CICPD3    Daily CICS Availability Report           06/06/27   13:09
  _    CICPM3    Monthly CICS Availability Report         06/06/27   13:10
  _    CICPW3    Weekly CICS Availability Report          06/06/27   13:10
  _    IMSCM3    Monthly IMS Availability Report          06/06/27   13:09
  _    IMSPM3    Monthly IMS Availability Report          06/06/27   13:10
  _    TSOCD3    Daily TSO Availability Report            06/06/27   13:09
  _    TSOCM3    Monthly TSO Availability Report          06/06/27   13:09
  _    TSOCW3    Weekly TSO Availability Report           06/06/27   13:09
  _    TSOPD3    Daily TSO Availability Report            06/06/27   13:10
  _    TSOPM3    Monthly TSO Availability Report          06/06/27   13:10
  C    TSOPW3    Weekly TSO Availability Report           06/06/27   13:10
 ------------------------------------------------------------------------------
```

Figure 2-25. Sample Database Inquiries Panel

On the Database Inquiries panel:

- Enter SHARED after the Catalog prompt.
- Enter the appropriate catalog group name after the Catalog Group prompt, and scroll the display until the inquiry that you want appears on the panel.

  Note: If the Catalog Group field is empty, the panel displays the list of catalog groups. You can select one (with the S line command) and press ENTER to display the entries for that catalog group.
- Enter C in the Cmd column for the inquiry you want.

Figure 2-25 illustrates a Database Inquiries Panel just before ENTER was pressed. Inquiry TSOPW3 is being copied from the shared library to a private library.

Note that the Abstract (A) and View Sample (V) line commands may be used to display information about a particular inquiry and view a sample of the inquiries output in order to help decide which inquiry to copy.

```
---------------------------  Inquiry Repeat/Copy  -------------- Copy Inquiry
 Command ===>

 Catalog:  SHARED

      Inquiry Name   ===> TSOPW3
              Title  ===> Weekly TSO Availability Report
              Author ===> CA

 Catalog Group Name  ===> AVAIL
               Title ===> Availability Analysis



 Press ENTER to add the new inquiry to your private inquiry catalog.
 or
 Press END to cancel.

 ------------------------------------------------------------------------------
```

Figure 2-26. Inquiry Repeat/Copy Panel

Before adding the copied inquiry to your library, MICF asks you to provide a name for the inquiry. This is done on the Inquiry Repeat/Copy panel (Figure 2-26).

```
---------------------------  Inquiry Repeat/Copy  -------------- Copy Inquiry
 Command ===>

 Catalog:  SHARED

      Inquiry Name   ===> TSOPW3
              Title  ===> Weekly TSO Availability Report
              Author ===> CA

 Catalog Group Name  ===> TSOCOPY
               Title ===> TSO Inquiries from Shared Catalog



 Press ENTER to add the new inquiry to your private inquiry catalog.
 or
 Press END to cancel.

 ------------------------------------------------------------------------------
```

Figure 2-27. Inquiry Repeat/Copy Panel after Data Entry

This panel repeats the inquiry name, title, author, catalog group name, and title from the shared catalog. You can change any of the information that is repeated from the shared catalog before adding the inquiry to your private catalog. The inquiry name can be any six-character name you choose, as long as it does not duplicate another inquiry name in your private catalog.

Note: If you plan to use MICF Web publishing, you must avoid using the '#' character in your inquiry name. The '#' character is interpreted by the UNIX environment as a command, and will cause an error during Web publishing.

The name can, if you like, be the same as the inquiry name in the shared catalog. If you enter a catalog group name that has not been used before, MICF creates a new catalog group for you. If you enter an existing catalog group name, MICF adds the new inquiry to that catalog group.

Tip: MICF supports the standard ISPF split screen function. If you want to check the names in your private catalog without leaving the Inquiry Repeat/Copy panel, you can issue the SPLIT command (usually PF2). After your screen is divided into two parts, you will see a portion of the Inquiry Repeat/Copy panel on the first screen. The second screen will contain either the ISPF/PDF primary option menu (Figure 2-4) or the CA MICS Workstation Facility (MWF) menu, depending on the way in which your site has installed CA MICS. Bring up your private catalog on the second screen. The SWAP command (usually PF9) lets you switch between the two screens. Repeated use of the END command (usually PF3) on either screen will cancel the split at the time you would normally return to the TSO READY prompt. You can then continue working on the remaining side of the split.

You might decide to use the same inquiry name as the shared catalog, to use the catalog group name TSOCOPY, and to change the catalog group title to "TSO Inquiries from Shared Catalog." If you also decide to leave the author and inquiry title unchanged, you would complete the panel as shown in Figure 2-27.

```
---------------------------  Database Inquiries  ------------- Inquiry Copied
 Command ===>                                                 Scroll ===> PAGE

 Catalog     ===> PRIVATE (PRIVATE/SHARED)  Catalog Group         ===> TSOCOPY
 Create New Inquiry ===> ______     (Name)  Name (subset display) ===> ________


 Line Cmds: A Abstract V View Sample E Execute  B Batch    F Foreground
            S Select   M Modify      C Copy     R Repeat   D Delete

 Cmd   Name                   Title                        Date     Time
  -   ------  ---------------------------------------  ---------  -----
  _    TSOPW3  Weekly TSO Availability Report           06/06/27   17:25
 ****************************** BOTTOM OF DATA ********************************
```

Figure 2-28. Sample Database Inquiries Panel Showing a Private Catalog

When you press ENTER, the inquiry is added to your private catalog and you see the Database Inquiries panel with Catalog set to PRIVATE and Catalog Group set to the group specified on the Inquiry Repeat/Copy panel.

If this is the first entry you have made in your private catalog for this catalog group, the Database Inquiries panel display will look like Figure 2-28. If you have made other entries in the catalog group, the Database Inquiries panel will have additional entries for the other inquiries. Inquiries are displayed alphabetically by the inquiry name. The cursor will be positioned on the row for the inquiry that you just added.

2.5.2 Repeating an Inquiry in Your Private Catalog

The repeat command is comparable to the Copy command. The only functional difference is that the Copy command copies an inquiry from the shared catalog to your private catalog, while the Repeat command repeats an inquiry that is already in your private catalog. In both cases the new inquiry is placed in your private catalog.

To repeat an inquiry, enter R in the Cmd column next to the name of the inquiry you want to repeat. The resulting panels and procedures are almost the same as for copying an inquiry. The only exception is that the inquiry name is not repeated for the new inquiry. The cursor is placed at the beginning of the name field, ready for you to enter the one to six-character name for the inquiry.

There are two reasons why you might want to repeat an inquiry. You may want to create another inquiry through modification that is similar in some respects to the original inquiry; or you may want to change the descriptive information about the inquiry, such as its name, title, or catalog group. In the second case, you would probably want to delete the first copy of the inquiry in your catalog.

2.5.3 Deleting an Inquiry

You can delete an inquiry from your private catalog by entering a D in the Cmd column next to the name of the inquiry. Only the system administrator can delete an entry from the shared catalog.

2.5.4 Changing an Inquiry

Only inquiries in private catalogs can be changed. To change an inquiry in your private catalog, first perform the following steps:

- Go to the Database Inquiries panel
- Select your PRIVATE catalog

Next, select the inquiry that you will change on the Database Inquiries panel by entering S or M in the Cmd column next to the name of the inquiry. You can then change most of the attributes of the inquiry that you or the original author set when the inquiry was first created. The only attributes of the inquiry that you cannot change at this point are the Inquiry Name, Title, Author, and Catalog Group. Note that these identification attributes were available for modification on the Inquiry Repeat/Copy panel.

What you see when you select an inquiry for modification depends on whether the inquiry is a direct inquiry or a structured inquiry:

- A direct inquiry is specified on one panel, produces a single report, is report-oriented, and allows very little data manipulation.

- A structured inquiry has multiple steps, each of which is defined on a separate panel or series of panels. Structured inquiries allow you to perform extensive data manipulation and to request any number of reports.

Each type of inquiry is illustrated below. You can find a more detailed description of each type of inquiry in Section 2.6, Creating New Inquiries.

2.5.4.1 Modifying a Direct Inquiry

```
 ----------------------------  Database Inquiries  -----------------------------
Command ===>                                                  Scroll ===> PAGE

Catalog     ===> PRIVATE (PRIVATE/SHARED)  Catalog Group         ===> TSOCOPY
Create New Inquiry ===> ______     (Name)  Name (subset display) ===> ________


Line Cmds: A Abstract V View Sample E Execute  B Batch    F Foreground
           S Select   M Modify      C Copy     R Repeat   D Delete

Cmd   Name                  Title                        Date     Time
 -   ------  ---------------------------------------  ---------  -----
 _   TSOPW3  Weekly TSO Availability Report           06/06/27   17:25
 s   TEST1   Test of Direct Inquiry Composition       06/10/11   22:08
****************************** BOTTOM OF DATA ********************************
```

Figure 2-29. Selecting Inquiry TEST1 for Modification

We will illustrate modifying a direct inquiry by expanding the report generated by an inquiry named TEST1. To modify TEST1, first select it from your private catalog (see Figure 2-29).

You will then see the panel that specifies what the inquiry does (Figure 2-30).

```
 --------------------------  Direct Ranking Report  --------------------------
Command ===>
Enter a ? in any data entry field for more information on valid values.
Modifying CA MICS Inquiry: TEST1 - Test of Direct Inquiry Composition
Inquiry Step ===> Direct Ranking Report
CA MICS File ===> TSU (fff) Timespan ===> DAYS Cycle(s) ===> 01 - __
Database     ===> P  (PROD )   File Name: TSO USER ACTIVITY FILE
Report Title ===> Ranking of Top Ten Users on Average Think Time

Rank ===> TSUAVKTM (file element)  Order ===> D (A/D)  No. Records ===> 10

Data Elements To Be Reported       ===> TSUTHKTM  USER      ________  ________
________  ________  ________  ________  ________  ________  ________  ________
________  ________  ________  ________  ________  ________  ________  ________


Print Rankings For Each Value of   ===>     SYSID    _ HOUR____ _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

Skip to New Page By     ===> ________  (New page when value changes)
Generate Subtotals By   ===> ________  (Print subtotals when value changes)

Specify Extended Options ===> N (Y/N)
 -------------------------------------------------------------------------------
```

Figure 2-30. Initial Description of Direct Inquiry TEST1

Since TEST1 is a direct inquiry that produces a ranking report, the panel that is displayed has the title Direct Ranking Report. This inquiry reports on data from the CA MICS TSO User Activity File (the TSU file). It uses the first cycle of the DAYS timespan in the production database (P). The report title is Ranking of Top Ten Users on Average Think Time.

The file element on which the users are ranked for this report is TSUAVKTM, Average Think Time. Two other pieces of information are on the report: TSUTHKTM (Think Time Total) and USER (User Identification). Separate rankings are produced for each SYSID and HOUR on the database.

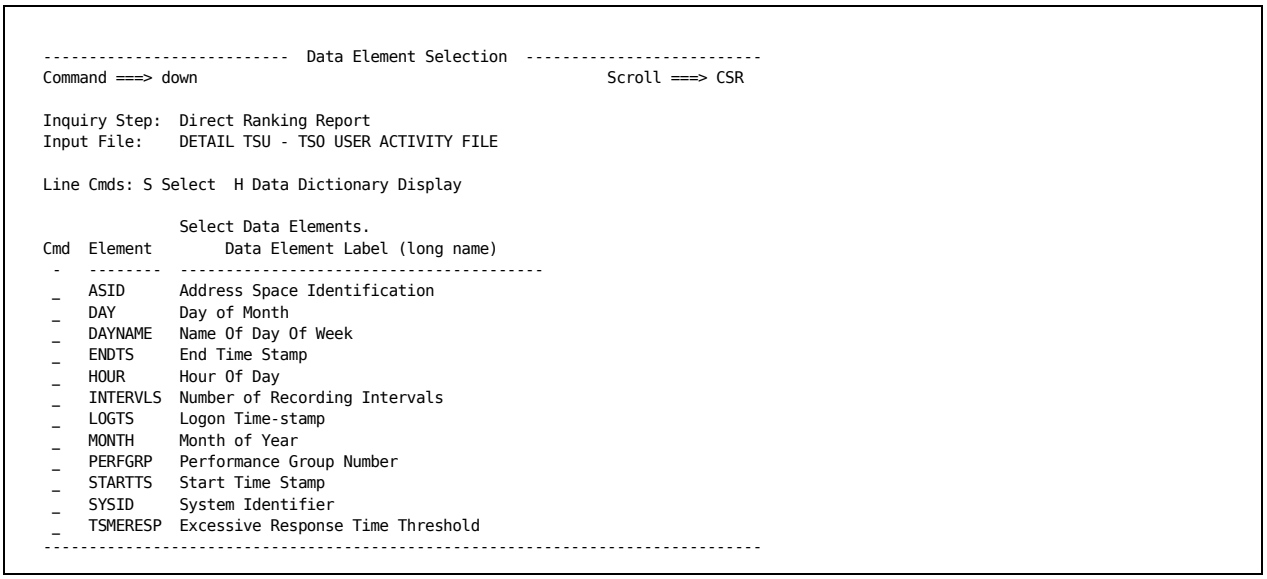
We would like to increase the number of users ranked in the report from 10 to 25. We would also like the report to show the connect time, number of instructions processed, CPU time consumed, and processing charges for each user.

If you know the CA MICS element names for this information in the TSU file, you could simply add the element names to the

```
 list of data elements to be reported.

 --------------------------  Direct Ranking Report  --------------------------
Command ===>
Enter a ? in any data entry field for more information on valid values.
Modifying CA MICS Inquiry: TEST1 - Test of Direct Inquiry Composition
Inquiry Step ===> Direct Ranking Report
CA MICS File ===> TSU (fff) Timespan ===> DETAIL Cycle(s) ===> 01 - __
Database     ===> P  (PROD )   File Name: TSO USER ACTIVITY FILE
Report Title ===> Ranking of Top Ten Users on Average Think Time

Rank ===> TSUAVKTM (file element)  Order ===> D (A/D)  No. Records ===> 10

Data Elements To Be Reported       ===> TSUTHKTM  USER      ?_______  ________
________  ________  ________  ________  ________  ________  ________  ________
________  ________  ________  ________  ________  ________  ________  ________


Print Rankings For Each Value of   ===>     SYSID    _ HOUR     _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

Skip to New Page By     ===> ________  (New page when value changes)
Generate Subtotals By   ===> ________  (Print subtotals when value changes)

Specify Extended Options ===> N (Y/N)
 ------------------------------------------------------------------------------
```

Figure 2-31. Typing a Question Mark to Ask for a List of Valid Elements

If you do not know the names of the relevant elements, MICF can assist you in finding them. To see a list of available element names, type a question mark in one of the blanks in the list of data elements to be reported and press ENTER (Figure 2-31). MICF will display a data element selection panel containing the data elements available in the TSU file (Figure 2-32).



```
--------------------------  Data Element Selection  -------------------------
Command ===> down                                          Scroll ===> CSR

Inquiry Step:  Direct Ranking Report
Input File:    DETAIL TSU - TSO USER ACTIVITY FILE

Line Cmds: S Select  H Data Dictionary Display

               Select Data Elements.
Cmd  Element        Data Element Label (long name)
 -   --------  ----------------------------------------
 _   ASID      Address Space Identification
 _   DAY       Day of Month
 _   DAYNAME   Name Of Day Of Week
 _   ENDTS     End Time Stamp
 _   HOUR      Hour Of Day
 _   INTERVLS  Number of Recording Intervals
 _   LOGTS     Logon Time-stamp
 _   MONTH     Month of Year
 _   PERFGRP   Performance Group Number
 _   STARTTS   Start Time Stamp
 _   SYSID     System Identifier
 _   TSMERESP  Excessive Response Time Threshold
--------------------------------------------------------------------------------
```

Figure 3-30. Initial Data Element Selection Panel Display

Figure 2-32. Initial Data Element Selection Panel Display

```
 --------------------------  Data Element Selection  --------------------------
Command ===>                                                Scroll ===> CSR

Inquiry Step:  Direct Ranking Report
Input File:    DETAIL TSU - TSO USER ACTIVITY FILE

Line Cmds: S Select  H Data Dictionary Display

               Select Data Elements.
Cmd  Element        Data Element Label (long name)
 -   --------  ---------------------------------------
 _   TSUAVSTM  Avg Short Response Time
 _   TSUAVTTM  Avg Response Time All Functions
 _   TSUCONTM  Terminal Connect Time                    Selected
 _   TSUCOST   Processing Charges                       Selected
 _   TSUCPUNI  Instructions Executed                    Selected
 _   TSUCPUTM  CPU Time Consumed                        Selected
 _   TSUERESC  Excessive Response Event Count
 _   TSUERSTM  Excessive Response Time Total
 _   TSUEXCPS  I/O (EXCPs) Generated
 _   TSUGETCH  TGET Character Traffic
 _   TSULCOM   Long Commands Processed
 _   TSULDST1  Count Long Responses Within Limit 1
 _   TSULDST2  Count Long Responses Within Limit 2
-------------------------------------------------------------------------------
```

Figure 2-33. Result of Selecting Four TSU Data Elements

Since there are over one hundred elements in the TSU file, not all of them can be shown on the screen at the same time. To see additional elements, enter the DOWN command after the primary command prompt to scroll through the element list. Continue until you see the portion of the list containing TSUCONTM (Terminal Connect Time), TSUCOST (Processing Charges), TSUCPUNI (Instructions Executed), and TSUCPUTM (CPU Time Consumed).

Tip: If you know the spelling of the element names that you need, you can reach the same part of the list more quickly by using the LOCATE command. For example, you could have reached the part of the list containing the TSU elements by entering LOCATE TSU or L TSU in the Command area. You could then scroll down to the part of the list containing the TSUCONTM, TSUCOST, TSUCPUNI, and TSUCPUTM data elements.

Since this is the information you want to include in your report, enter S in the Cmd column next to each of the four element names. The result is shown in Figure 2-33.

You could now continue scrolling and selecting additional elements to be included in your report. If you would like detailed information about an element, you can enter H in the Cmd column next to the element's name. The data dictionary entry for that element is displayed.

```
 --------------------------  Direct Ranking Report  --------------------------
Command ===>

Modifying CA MICS Inquiry: TEST1 - Test of Direct Inquiry Composition
Inquiry Step ===> Direct Ranking Report
CA MICS File ===> TSU (fff) Timespan ===> DETAIL Cycle(s) ===> 01 - __
Database     ===> P  (PROD )   File Name: TSO USER ACTIVITY FILE
Report Title ===> Ranking of Top Ten Users on Average Think Time

Rank ===> TSUAVKTM (file element)  Order ===> D (A/D)  No. Records ===> 10

Data Elements To Be Reported       ===> TSUTHKTM  USER      TSUCONTM  TSUCOST
TSUCPUNI  TSUCPUTM  ________  ________  ________  ________  ________  ________
________  ________  ________  ________  ________  ________  ________  ________

Print Rankings For Each Value of   ===>     SYSID    _ HOUR     _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

Skip to New Page By     ===> ________  (New page when value changes)
Generate Subtotals By   ===> ________  (Print subtotals when value changes)

Specify Extended Options ===> N (Y/N)
```

Figure 2-34. Direct Ranking Report for TEST1 after Adding Four Elements

When you have finished selecting data elements, enter the END command. MICF returns to the Direct Ranking Report panel, which now includes the data elements that you just selected (Figure 2-34).

```
 --------------------------  Direct Ranking Report  --------------------------
Command ===> END

Modifying CA MICS Inquiry: TEST1 - Test of Direct Inquiry Composition
Inquiry Step ===> Direct Ranking Report
CA MICS File ===> TSU (fff) Timespan ===> DETAIL Cycle(s) ===> 01 - _ _
Database     ===> P  (PROD )   File Name: TSO USER ACTIVITY FILE
Report Title ===> Ranking of Top Ten Users on Average Think Time

Rank ===> TSUAVKTM (file element)  Order ===> D (A/D)  No. Records ===> 25

Data Elements To Be Reported       ===> TSUTHKTM  USER      TSUCONTM  TSUCOST
TSUCPUNI  TSUCPUTM  ________  ________  ________  ________  ________  ________
________  ________  ________  ________  ________  ________  ________  ________


Print Rankings For Each Value of   ===>     SYSID    _ HOUR     _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

Skip to New Page By     ===> ________  (New page when value changes)
Generate Subtotals By   ===> ________  (Print subtotals when value changes)

Specify Extended Options ===> N (Y/N)
 ------------------------------------------------------------------------------
```

Figure 2-35. Direct Ranking Report with Number of Records Value Changed

By changing the value after the No. Records prompt from 10 to 25, you increase the number of users included in the report to 25. Note that the Inquiry Step on the panel is the default name of the report type, Direct Ranking Report. You can change it to be more descriptive by entering a new name in the Inquiry Step Name field. (In a direct inquiry, the step name appears only on the report definition panel. In a structured inquiry, the step name appears on the report definition panel and in the list of inquiry steps.)

At this point, all of the needed changes have been made to the report. Confirm your changes by pressing ENTER; then save the panel by pressing END, as in Figure 2-35.

Note: After you make a change on a MICF panel, you must press ENTER before giving the END command. If you forget to do so, you will see the message "END not valid" at the top right corner of your screen. Pressing ENTER instructs MICF to process your commands or edit a panel. The END command accepts the specifications of the panel and exits to the Direct Inquiry Processing panel (Figure 2-36).

```
 ---------------------------  Inquiry Processing  ----------------------------
Command ===>


   Active MICF Inquiry:  TEST1  - Test of Direct Inquiry Composition
                Author:           your name


   Specify Inquiry processing ===> EXECUTE (EXECUTE/MODIFY/SAVE/CANCEL)
     EXECUTE - Execute the inquiry.
     MODIFY  - Redisplay the direct inquiry for modification.
     SAVE    - Exit from inquiry composition and save the direct inquiry.
     CANCEL  - Exit from inquiry composition without saving the inquiry.


Instructions:

   Specify desired option and press ENTER key.
```

Figure 2-36. Direct Inquiry Processing Panel for Modified Inquiry TEST1

This panel gives you four choices:

- EXECUTE -- By entering EXECUTE after the prompt, the inquiry is immediately executed. MICF takes you to an inquiry execution panel that operates as described in section 2.4. (If you execute the inquiry now, you will have a chance to save or modify it after you review the output that is generated by the inquiry.)

- MODIFY -- By entering MODIFY after the prompt, you can return to the direct inquiry specification panel to make additional modifications.

- SAVE -- By entering SAVE, you can add the modified inquiry to your private catalog and return to the Database Inquiries panel, which displays your catalog.

- CANCEL -- By entering CANCEL, you return to the Database Inquiries panel without saving the modified inquiry.

You have now completed the modification of a direct inquiry.

2.5.4.2 Modifying a Structured Inquiry

```
------------------------  Printer Vertical Bar Chart  -----------------------
 Command ===>

 Modifying CA MICS Inquiry: TSOPW3 - Weekly TSO Availability Report
 Inquiry Step ===> Printer Vertical Bar Chart - DOWNTIME by ZONE
 Input File   ===> FILE1    - Intermediate File Number 1    (From:  DAYS TSO   )
 Report Title ===> Weekly TSO Availability - Downtime by Zone

 Chart of      ===> DOWNTIME (Y-Axis)   Grouped by  ===> DATE     (Element)
 Charted by    ===> ZONE     (X-Axis)   Weighted by ===> ________ (Element)
 Type of Chart ===> SUM  (SUM/MEAN/FREQ/PCT)

 Generate Graph for Each Value of   ===>     SYSID    _ ________ _ ________ _
 ________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

 Graph a Discrete X-Axis   ===> Y (Y/N)  X-Axis Bar Size Sequence  ===> _ (A/D)
 Graph Cumulative Values   ===> N (Y/N)
 Draw Reference Line At    ===> _______________


 Specify Extended Options ===> N (Y/N)  ** Specified **
 ------------------------------------------------------------------------------
```

```
------------------------  MICF Inquiry Step Display  ------------------------
```

```
Command ===>                                                  Scroll ===> CSR

 Modifying CA MICS Inquiry: RPTCP3 - Printed Report Only

Execute ===> N (Y/N)     Execution Mode ===> BATCH      (BATCH/FOREGROUND)

Line Cmds: S Select  I Insert  D Delete  M Move  R Repeat  C Copy

Cmd                       Inquiry Step                          Input File
 -   ---------------------------------------------------------  -----------

. . . . . .
```

Figure 2-37. MICF Inquiry Step Display for TSOPW3

Inquiry TSOPW3 produces a printer vertical bar chart on TSO downtime by hour. Assume that you would like to see the same information reported by zone as well. You can do this by specifying MODIFY on the Database Inquiries panel, selecting TSOPW3 from the list on the panel, and then adding a report at the end of the inquiry as an additional inquiry step.

When you select TSOPW3, you see the MICF Inquiry Step Display panel as shown in Figure 2-37.

There are three ways you could produce another vertical bar chart at the end of this inquiry:

- Insert -- You could type I in the Cmd column on the last line to insert another step in the inquiry after the line on which the I is placed. If you use the insert command, MICF prompts you for the type of inquiry step to add, and then follows with a series of related prompts.

- Repeat -- You could type R in the Cmd column to repeat the current vertical bar chart of Commands by hour. The new step is placed on a new line following the one on which you type R.

- Copy -- You could type C in the Cmd column to copy the current vertical bar chart of Commands by hour. To use the Copy command, you must insert an A in the Cmd column on the line after which the new step should be placed or a B on the line before which the new step should be placed.

The easiest choice in this situation is to use the repeat command by typing an R in the Cmd column on the line reading "Printer Vertical Bar Chart - DOWNTIME by HOUR." When you have done this and pressed ENTER, the MICF Inquiry Step Display looks like that in Figure 2-38.

```
------------------------  MICF Inquiry Step Display  --- Validation R
```

```
Command ===>                                                  Scroll ===> CSR


Modifying CA MICS Inquiry: RPTCP3 - Printed Report Only


Inquiry validation is required.  Enter VALIDATE to validate the inquiry.


Execute ===> N (Y/N)     Execution Mode ===> BATCH      (BATCH/FOREGROUND)

Line Cmds: S Select  I Insert  D Delete  M Move  R Repeat  C Copy

Cmd                         Inquiry Step                          Input File
 -   ----------------------------------------------------------  -----------
```

```
 _   CA MICS File Selection                                      DAYS TSO
 _   Execution-Time Data Selection - Select SYSID               FILE1
 _   Execution-Time Data Selection - Select ZONE                FILE1
 _   Execution-Time Data Selection - Select HOUR                FILE1
 _   Execution-Time Data Selection - Exclude Weekends           FILE1
 _   Data Element Derivation - Compute DOWNTIME                 FILE1
 _   Execution-Time Data Selection - Downtime Objective         FILE1
 _   Data Element Derivation - Derive DATE From ENDTS           FILE1
 _   Printer Vertical Bar Chart - DOWNTIME by HOUR              FILE1
 _   Printer Vertical Bar Chart - DOWNTIME by HOUR              FILE1
****************************** BOTTOM OF DATA ********************************
```

Figure 2-38. MICF Display after Repeating the Vertical Bar Chart

Note that another Printer Vertical Bar Chart step has been added to the inquiry. Also notice that the top line of the inquiry contains the message, "Validation Required."

Validation is required because you made a change to the list of inquiry steps. You must validate your change before MICF executes the inquiry. You can make other changes now and validate a group of them at once instead of performing a separate validation for each of your changes. To validate a change, type VALIDATE, VAL, or V after the Command prompt on line two of the panel.

You are now ready to change the chart produced by the last inquiry step to report by zone instead of by hour. To make this change, select the last step by entering S in the Cmd column on the last line.

```
------------------------  Printer Vertical Bar Chart  ------------------------
 Command ===>
 Enter a ? in any data entry field for more information on valid values.
 Modifying CA MICS Inquiry: TSOPW3 - Weekly TSO Availability Report
 Inquiry Step ===> Printer Vertical Bar Chart - DOWNTIME by HOUR
 Input File   ===> FILE1    - Intermediate File Number 1    (From:  DAYS TSO   )
 Report Title ===> Weekly TSO Availability - Downtime by Hour

 Chart of      ===> DOWNTIME (Y-Axis)   Grouped by  ===> DATE     (Element)
 Charted by    ===> HOUR     (X-Axis)   Weighted by ===> ________ (Element)
 Type of Chart ===> SUM  (SUM/MEAN/FREQ/PCT)

 Generate Graph for Each Value of   ===>     SYSID    _ ________ _ ________ _
 ________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

 Graph a Discrete X-Axis   ===> Y (Y/N)  X-Axis Bar Size Sequence  ===> _ (A/D)
 Graph Cumulative Values   ===> N (Y/N)
 Draw Reference Line At    ===> _______________




 Specify Extended Options ===> N (Y/N)  ** Specified **
 -------------------------------------------------------------------------------
```

Figure 2-39. Printer Vertical Bar Chart for DOWNTIME by HOUR

MICF now displays the Printer Vertical Bar Chart panel, which you want to change (Figure 2-39).

All of the information following prompt arrows can be changed on this panel. To change the chart from a chart by HOUR to one by ZONE, only two changes are necessary. You should change the response to the Charted By prompt from HOUR to ZONE. You should also change the title of the inquiry step from "Printer Vertical Bar Chart - DOWNTIME by HOUR" to "Printer Vertical Bar Chart - DOWNTIME by ZONE." After you make these changes, the Printer Vertical Bar Chart panel looks like Figure 2-40.

```
------------------------  Printer Vertical Bar Chart  ------------------------
 Command ===>

 Modifying CA MICS Inquiry: TSOPW3 - Weekly TSO Availability Report
 Inquiry Step ===> Printer Vertical Bar Chart - DOWNTIME by ZONE
 Input File   ===> FILE1    - Intermediate File Number 1    (From:  DAYS TSO   )
 Report Title ===> Weekly TSO Availability - Downtime by Zone

 Chart of      ===> DOWNTIME (Y-Axis)   Grouped by  ===> DATE     (Element)
 Charted by    ===> ZONE     (X-Axis)   Weighted by ===> ________ (Element)
 Type of Chart ===> SUM  (SUM/MEAN/FREQ/PCT)

 Generate Graph for Each Value of   ===>     SYSID    _ ________ _ ________ _
 ________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _

 Graph a Discrete X-Axis   ===> Y (Y/N)  X-Axis Bar Size Sequence  ===> _ (A/D)
 Graph Cumulative Values   ===> N (Y/N)
 Draw Reference Line At    ===> _______________



 Specify Extended Options ===> N (Y/N)  ** Specified **
 ------------------------------------------------------------------------------
```

Figure 2-40. Modified Printer Vertical Bar Chart Panel

The extended options that you can choose are:

- Printer format parameters
- Data element labels and formats
- Subheading text and data formats
- Axis scale

In addition, there are three options that allow you to limit the amount of report output:

- Begin chart with record number
- Stop after charting a specified number of records
- Stop after printing a specified number of pages

All MICF reporting functions have similar extended options for customizing the report or graphics. Information on specifying extended options can be found in section 2.6.2.4 below and in the online tutorials for each extended options panel.

When you press END from this panel, MICF displays the message "Update Data Formats" at the top of the panel. This message appears because an extended option was specified that indicated a printing format for the values of HOUR. Since HOUR has been replaced by ZONE, you need to update the printing format specifications. Do so by selecting extended options and then going to the panel for data element labels and formats. You see label and format rows for DOWNTIME, ZONE, and SUM. The label for ZONE is correctly specified as Time Zone, and there is a blank in the Output Format field on the ZONE row. Since ZONE is a character variable, you do not need to specify any special output format. The blank is acceptable. If you like, you can change the label for ZONE. When you are satisfied with the contents of this panel, press END to return to the Printer Vertical Bar Chart panel (Figure 2-40).

```
------------------------  MICF Inquiry Step Display  --- Validati

Command ===>                                                Scroll ===> CSR

Modifying CA MICS Inquiry: RPTCP3 - Printed Report Only

_   CA MICS File Selection                                        DAYS TSO
_   Execution-Time Data Selection - Select SYSID                  FILE1
_   Execution-Time Data Selection - Select ZONE                   FILE1
_   Execution-Time Data Selection - Select HOUR                   FILE1
_   Execution-Time Data Selection - Exclude Weekends              FILE1
_   Data Element Derivation - Compute DOWNTIME                    FILE1
_   Execution-Time Data Selection - Downtime Objective            FILE1
_   Data Element Derivation - Derive DATE From ENDTS              FILE1
_   Printer Vertical Bar Chart - DOWNTIME by HOUR                 FILE1
_   Printer Vertical Bar Chart - DOWNTIME by ZONE                 FILE1
****************************** BOTTOM OF DATA ***********************************

. . . . . .
```

Figure 2-41. Inquiry Step Display after Modifications

Now when you press END from the Printer Vertical Bar Chart panel, MICF returns you to the Inquiry Step Display, which shows the changed step name for the second vertical bar chart (Figure 2-41).

```
----------------------  Active Inquiry Save Confirmation  ------ Confirm Save.
Command ===>

    Active MICF Inquiry:  TSOPW3 - Weekly TSO Availability Report
                Author:           CA

    Do you wish to save the current, active MICF Inquiry? ===> YES (YES/NO)

Instructions:

    Press ENTER  key to save the current, active MICF Inquiry.

    Reply NO and press ENTER key to delete the current, active inquiry.
--------------------------------------------------------------------------------
```

Figure 2-42. Inquiry Save Confirmation Panel

When you enter END from this panel, MICF asks you to confirm that you want to save the modified inquiry (Figure 2-42).

After you press ENTER, MICF returns you to the Database Inquiries panel and displays your private catalog and the most recently used catalog group. You have now completed the modification of a structured inquiry.

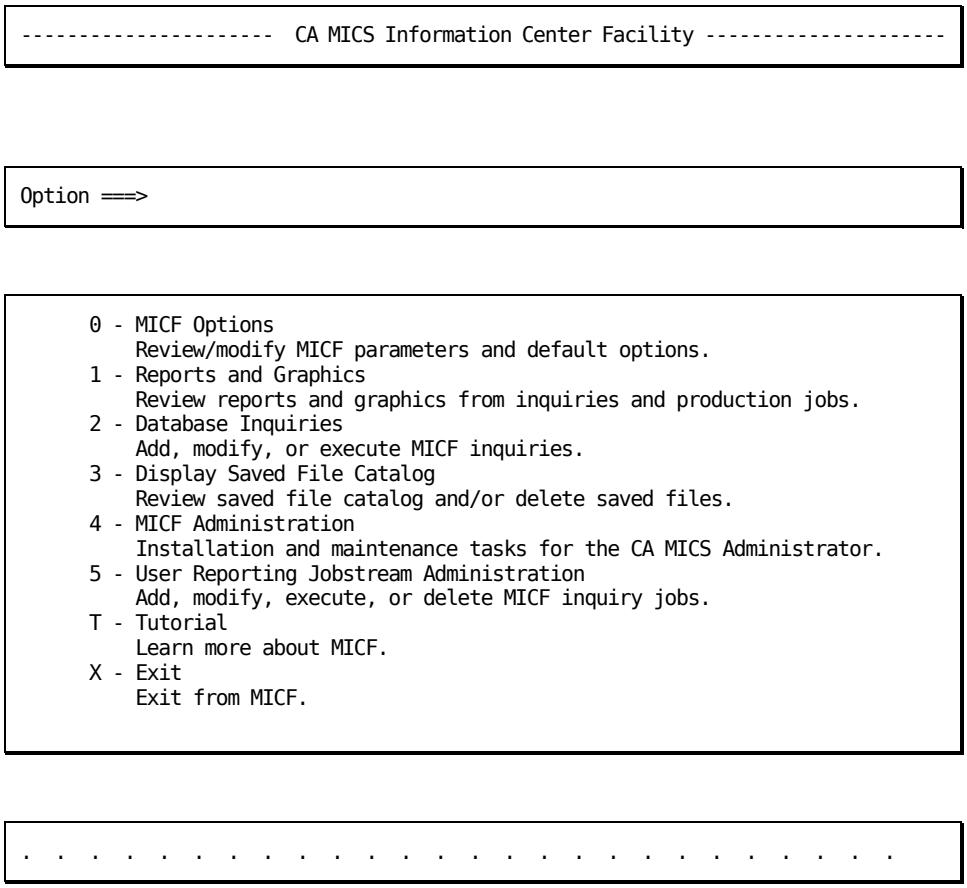


Figure 2-43. Primary MICF Menu

If you press END from the Database Inquiries panel, MICF returns you to the primary MICF menu (Figure 3-23).

2.6 Creating New Inquiries

This section shows you how to create your own MICF inquiries. As explained in Section 2.5.4, there are two types of MICF inquiries:

o Direct inquiries are designed to be easily developed on one panel. They allow limited data manipulation and can produce only one report at a time.

o Structured inquiries are extremely flexible and allow you to do any type of analyses that you could do in SAS.

A special type of structured inquiry, the user-written report, allows you to include non-MICF inquiries in the MICF inquiry catalogs. This facility can be reached from the same menu that is used to insert direct inquiries and structured inquiries in your catalog. It will not be discussed further in this guide, but it is described in the online tutorials, which are available when you select it.

Creating new inquiries is discussed in the following sections:

1 - Selecting reports

2 - Creating direct inquiries

3 - Creating structured inquiries

Each of these tasks is described below.

2.6.1 Selecting Reports

A MICF report is a computer-generated display of some portion of the information contained in the CA MICS database. It is the means by which you display CA MICS data in a usable form. Your choice of an appropriate report format will depend on what you want the report to accomplish for you.

You will find that it is often helpful to produce multiple reports displaying the same data or related data in order to display different aspects of your data. Choosing the right report to display your data can be of major importance in helping you complete your analyses or make your presentations.

In this section, we will summarize the types of reports available to you under MICF and will describe how to customize the MICF reports.

The following discussion is organized into two sections:

1 - Types of reports available

2 - Customizing MICF reports

2.6.1.1 Types of Reports Available

Under MICF, you can select from several classes of reports:

- Color Graphics
- Printer Graphics
- Printed Reports
- Statistical Analyses

Graphics reports are suitable for presentations and for assisting in the recognition of trends and anomalies:

- Color graphics require the use of a color terminal, pen plotter, or color printer.
- Printer graphics produce black and white graphs using standard printers.

Printed reports list the data you select in tables that can be used for reference purposes or further analyses. Statistical analyses offer a wide range of analytical tools that display your data and summarize its statistical characteristics.

Each of the four classes of reports is described separately below. Samples of each report are shown in the MICF Reference Guide.

2.6.1.1.1 Color Graphics

MICF offers a broad set of color graphics reports, including pie charts, block charts, star charts, simple X versus Y plots, and complex plots of multiple variables. The SAS/GRAPH software product is required for generating these reports. The following color graphics options are available:

- Vertical Bar Charts -- MICF uses the VBAR option of SAS PROC GCHART to create color vertical bar (or column) charts.

- Horizontal Bar Charts -- MICF uses the HBAR option of SAS PROC GCHART to create color horizontal bar (or histogram) charts.

- Pie Charts -- MICF uses the PIE option of SAS PROC GCHART to create color pie (or circle) charts. By using optional parameters, you can generate groups of related pie charts on one page.

- Block Charts -- MICF uses the BLOCK option of SAS PROC GCHART to create color block (or 3-dimensional column) charts.

- Star Charts -- MICF uses the STAR option of SAS PROC GCHART to create color star (or Kiviat) charts.

- Color Plots -- MICF uses SAS PROC GPLOT to create plots of one variable against another (for example, plot of response times by the number of page-ins per CICS transaction). By using optional parameters, you can create plots of multiple groups on a single axis (for example, plot of average number of users by hour for System 1 and plot of average number of users by hour for System 2).

- Relationship Plots -- MICF uses SAS PROC GPLOT to create scatter plots of two variables with a regression line. Each point on the plot represents the intersection of the values of the two variables and the regression line describes the relationship between the two variables.

- Stacked Plots -- MICF uses the SAS PROC GPLOT y*x=z option to create multiple plots on a single axis and scale (for example, plot demand pages per second and system pages per second by hour of day) with a detailed plot legend. You have the option of stacking the plot lines (that is, plotting demand pages per second as the first line and the sum of demand pages per second and system pages per second -- total pages per second -- as the second line) or plotting the values exactly as they are on the database (that is, show the relation between demand pages per second and system pages per second rather than the sum).

- Overlay Plots -- MICF uses the SAS PROC GPLOT OVERLAY option to create multiple plots on a single axis and scale (for example, plot demand pages per second and system pages per second by hour of day). Overlay plots do NOT have a legend.

2.6.1.1.2 Printer Graphics

You can use MICF printer graphics to create an extensive variety of black and white hardcopy reports. These reports are useful in initial data analysis and if you do not have access to color graphics devices. The following printer graphics options are available:

- Vertical Bar Charts -- MICF uses the VBAR option of SAS PROC CHART to create vertical bar (or column) charts.

- Horizontal Bar Charts -- MICF uses the HBAR option of SAS PROC CHART to create horizontal bar (or histogram) charts.

- Pie Charts -- MICF uses the PIE option of SAS PROC CHART to create pie (or circle) charts.

- Block Charts -- MICF uses the BLOCK option of SAS PROC CHART to create block (or 3-dimensional column) charts.

- Star Charts -- MICF uses the STAR option of SAS PROC CHART to create star (or Kiviat) charts.

- Printer Plots -- MICF uses SAS PROC PLOT to create plots of one variable against another (for example, plot of response times by the number of page-ins per CICS transaction). By using optional parameters, you can create plots of multiple groups on a single axis (for example, plot of average number of users by hour for System 1 and plot of average number of users by hour for System 2).

- Overlay Plots -- MICF uses the SAS PROC PLOT OVERLAY option to create multiple plots on a single axis and scale (for example, plot demand pages per second and system pages per second by hour of day). As with printer plots, you can also create plots of multiple groups of data on the same axis (for example, plot of demand pages per second and system pages per second for System 1 and a plot of the same information for System 2).

2.6.1.1.3 Printed Reports

MICF printed reports let you list the data elements you select in a variety of convenient formats. The following printed reports options are available:

- Standard List -- MICF uses SAS PROC PRINT to create a simple listing of your data with title, subtitle, page number, inquiry name, and run date at the top of each page. Column headings are repeated on each page for ease of reference.

- Structured List -- MICF uses SAS PROC PRINT to create a listing of your data similar to a standard list but with indented format for subheadings in the body of your report. You can

- Ranking Report -- MICF uses SAS PROC PRINT to create a report similar to the standard list except that the observations are ordered by the value of a specific element. You can specify that either the top or bottom n observations be printed on the report. For example, as part of a job tuning effort, you could list the top 10 jobs based on cost.

- Tabular Report -- MICF creates a formal printed report with columns of data values (for example, response time, cost, etc.) over rows of data observations or time periods (for example, hours of the day). You specify report sequence, data elements to report, page break and/or subtotal controls, and report subheadings. You can request both subtotals and grand totals, with subtotal options including sum (accumulate), maximum/minimum value, percent of total, and percent/amount of change from the first observation. A subtotal derivation extended option is available to define your own derived subtotal values (for example, average response time). Optional parameters allow you to generate multiple report lines for each input file observation and to control the specific column in which each item is printed. Column headings are specified for each data value or overridden with free-form, multiple line column headings. You can even include footnotes on the report.

- Tabular Ranking Report -- MICF creates a formal report listing the top or bottom n observations of the input file based on the specified ranking element. The ranking is presented in Tabular Report format with columns of data values (for example, response time, cost, etc.) over rows of ranked observations (for example, userids). The listing includes selected data elements from each file observation and is useful in identifying areas for further study. You can optionally input detail observations, base the ranking on a user-specified summarization of these detail observations, and print the detail observations comprising the ranked summary observations. Summarization options include sum (accumulate), maximum/minimum value, percent of total, and percent/amount of change from the first observation. A subtotal derivation extended option is available to define your own derived subtotal values (for example, average response time). Optional parameters allow you to generate multiple report lines for each input file observation and to control the specific column in which each item is printed. Column headings are specified for each data value or overridden with free-form, multiple line column headings. You can even include footnotes on the report.

2.6.1.1.4 Statistical Analyses

MICF allows you to do most common descriptive and inferential statistical analyses on data from the CA MICS database. These analyses are useful in numerous performance, capacity planning, and installation accounting studies. The statistical analysis options are:

- Frequency Distribution -- The frequency distribution option generates a simple frequency distribution for a single variable. It also reports frequency count, percentage, cumulative frequency, and cumulative percentage for each value of the variable. This option uses SAS PROC FREQ.

- Crosstabulation Report -- The crosstabulation report option generates a table that shows the combined frequency distribution for two variables. For example, a table for the variables SYSID and COMMAND would create a table with a separate column for each SYSID and a separate row for each TSO command contained in the data. The cells of the table would show the frequency with which each command was used on each system. In addition, cells can optionally contain the percentage of the observation represented by this cell, the percentage of the column total represented by the cell, and the percentage of the row total represented by the cell. This option uses SAS PROC FREQ.

- 3-Way Crosstabulation Report -- The 3-way crosstabulation report option defines a set of tables that show the combined frequency distribution of three variables. For each value of Z, a 2-way crosstabulation report is created showing the combined frequency distribution for X and Y. For example, you might create a variable USERGRP that groups your systems users into a small number of categories. You might then create a 3-way crosstabulation showing SYSID by COMMAND for each value of USERGRP. Such an analysis could be useful in determining who is in need of training or who is making the greatest use of specific resources. This option uses SAS PROC FREQ.

- N-Way Crosstabulation Report -- The N-way crosstabulation report is a generalization of the 3-way crosstabulation report that allows you to show the combined frequency distributions for up to six variables. This option uses SAS PROC FREQ.

- Descriptive Statistics Report -- Use the descriptive statistics report option to generate basic descriptive statistics for numeric variables. The report can include:

  - -- Name of the variable
  - -- Number of observations
  - -- Sum of the weights of the observations
  - -- Sum of the observations
  - -- Mean
  - -- Standard deviation
  - -- Variance
  - -- Skewness
  - -- Kurtosis
  - -- Uncorrected sum of squares
  - -- Corrected sum of squares
  - -- Coefficient of variation
  - -- Standard error of the mean
  - -- Student's t value
  - -- Probability of a greater absolute value for Student's t
  - -- Approximation of the probability of a greater absolute value for student's t if the population mean is 0
  - -- Number of nonzero observations
  - -- Largest value
  - -- Smallest value
  - -- Range
  - -- Difference between the upper and lower quartile
  - -- Mode
  - -- Quartiles
  - -- 1st, 5th, 10th, 90th, 95th, and 99th percentile
  - -- Five lowest and highest observations

  In addition, a number of statistics on missing values are provided. You can also request that a number of analytic plots be printed. This option uses SAS PROC UNIVARIATE.

- Correlation Report -- The correlation report option lets you examine the linear relationship between a pair of variables by generating a number of correlation statistics. The analysis can be extended to up to five variables correlated against five different variables. Statistics that you can request include the following:

  -- Pearson correlations
  -- Spearman coefficients
  -- Kendall tau-b coefficient
  -- Hoeffding's D statistic
  -- Descriptive statistics
  -- Significance probabilities
  -- Sums of squares cross product matrices
  -- Covariance matrix

  You can specify one of four variance calculations and whether or not to accept missing values. This option uses SAS PROC CORR.

- Stepwise Regression Report -- The stepwise regression report option produces a model for a dependent variable Y based on a number of independent variables X1, X2, ... , Xn. You can choose either forward or backward regression, and can specify the minimum and maximum R-square values for inclusion (or exclusion). An analysis of variance report is produced for each step in the procedure. You can also define entry significance levels and stay levels to be used when building your model. It is possible to force selected entries to be used in the model and to specify the minimum and maximum number of variables to be used in the model. Model building statistics will be shown if you request them. This option uses SAS PROC STEPWISE.

2.6.1.2 Customizing MICF Reports

MICF is designed so that you can get useful reports from an inquiry by specifying a minimum amount of information. Standard formats exist for all the MICF reports. You will probably find that the formats for these reports are useful for most of your day-to-day analysis needs. However, there will probably come a time when you want to revise the format of a MICF report. You may want to change the report titles or headings or you may want the data to be printed with a different number of decimal places. When printing graphs, you may want to add a reference line or change the scale of an axis. For purposes of an initial investigation, you may decide to analyze only the first one hundred records or to generate only two pages of a lengthy report. MICF makes changes such as these and many others easy.

There are two places where you have the opportunity to customize your reports:

1 - The report definition panel

2 - The extended options panel

We will discuss each of these panels separately below.

2.6.1.2.1 The Report Definition Panel

There is one report definition panel for each type of direct or structured report in MICF. The report definition panel for each report is where you tell MICF what data elements to include in the report, the title of the report, whether or not you want to set extended options, and a number of report-specific facts. You reach the report definition panel for each report when you select the report from one of the direct or structured inquiry menus (or when you modify a direct inquiry or select a report step in a structured inquiry). For example, if you select Pie Chart from the Direct Inquiry Color Graphics menu, then the next panel that you will see is the Direct Pie Chart report definition panel. The most common types of customization you will need to perform are included in the report definition panel for each report. The report definition panel for a direct inquiry ranking report is shown in Figure 2-44 part A. The corresponding structured inquiry panel for a color pie chart is shown in Figure 2-44 part B. Page 10 of the output corresponding to Figure 2-44 Part A is shown in Figure 2-45.

```
--------------------------  Direct Ranking Report  --------------------------
Command ===>
Enter a ? in any data entry field for more information on valid values.
Composing CA MICS Inquiry: TOPTEN - Ranking of Top Ten Users on Think Time
Inquiry Step ===> Direct Ranking Report
CA MICS File ===> TSU (fff) Timespan ===> DAYS Cycle(s) ===> 01 - __
Database     ===> B  (BASE)    File Name: TSO USER ACTIVITY FILE
Report Title ===> Ranking of Top Ten Users on Average Think Time
 Rank ===> TSUAVKTM (file element)  Order ===> D (A/D)  No. Records ===> 10
 Data Elements to Be Reported       ===> TSUTHKTM  USER      TSUAVTTM  ________
________  ________  ________  ________  ________  ________  ________  ________
________  ________  ________  ________  ________  ________  ________  ________

Print Rankings for Each Value of   ===>     SYSID    _ HOUR____ _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _
 Skip to New Page by     ===> HOUR____  (New page when value changes)
Generate Subtotals by    ===> HOUR____  (Print subtotals when value changes)
 Specify Extended Options ===> N (Y/N)
------------------------------------------------------------------------------
        Part A. Sample Report Definition Panel for a Direct Ranking Report




 ----------------------------  Color Pie Chart  ----------------------------
Command ===>
Enter a ? in any data entry field for more information on valid values.
Composing CA MICS Inquiry: THINKT - Analysis of User Think Time
Inquiry Step ===> Color Pie Chart
Input File   ===> FILE1    - Intermediate File Number 1    (From:  DAYS TSU   )
 eport Title ===> Total Think Time by User
 Chart of      ===> TSUTHKTM (Value)    Grouped by  ===> ________ (Pies)
Charted by    ===> USER____ (Slices)   Weighted by ===> ________ (Element)
 Generate Graph for Each Value of   ===>     SYSID    _ HOUR____ _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _
 Graph Discrete Segments   ===> N (Y/N)
Minimum Segment Size (%)  ===> ___ (0 - 100)


Specify Extended Options ===> N (Y/N)
------------------------------------------------------------------------------
         Part B. Sample Report Definition Panel for Color Pie Chart
```

Figure 2-44. Sample Report Definition Panels

```
Ranking of Top Ten Users on Average Think Time
                                ABC COMPANY, INC.

INQUIRY:  TOPTEN                                          RUN DATE:  26DEC00

 ---------------------SYSTEM IDENTIFIER=PROD  HOUR OF DAY=10---------------------

               TSUAVKTM         TSUTHKTM    USER            TSUAVTTM

             0:23:21.79       0:23:21.79    ABC019         0:00:00.14
             0:19:14.30       0:38:28.60    ABC101         0:00:00.59
             0:06:35.29       0:13:10.58    ABC023         0:00:00.55
             0:02:04.35       0:06:13.04    ABC070         0:00:01.36
             0:01:52.99       0:07:31.97    ABC077         0:00:00.05
             0:00:20.45       0:01:42.25    ABC265         0:00:00.24
             0:00:19.62       0:02:56.54    ABC115         0:00:01.12
             0:00:16.51       0:03:18.17    ABC114         0:00:08.38
             0:00:13.82       0:00:27.64    ABC004         0:00:08.18
             0:00:08.43       0:04:29.76    ABC306         0:00:00.38
 ------------------------------------------------------------------------------
```

Figure 2-45. Sample Output from Ranking Report

The ranking report definition panel is requesting a listing of data from the DAYS timespan of the TSU file in database B. The data are to be ranked in descending order by the value of data element TSUAVKTM (Average User Think Time). For each observation, the value of the following variables will be reported:

- TSUAVKTM -- Average user think time
- TSUTHKTM -- Total think time
- USER -- User identifier
- TSUAVTTM -- Average response time (all functions)

While the report definition panels vary among report types, there are a number of features common to each one. The tutorials behind each report definition panel provide detailed instructions on completing the panel as well as examples of completed panels and the resulting output.

You will have the opportunity to specify the following items on all report definition panels:

- Inquiry Step
- Input File
- Report Title
- Data Elements to be Processed
- Page Control Specifications
- Report-Specific Options
- Extended Options

Each of these items is described separately below.

INQUIRY STEP

The inquiry step name is the name shown on the step list for structured inquiries. Use it as a reminder of the purpose of the step. The default inquiry step name is the report type. In both parts of this example, it has been left as the default: "Direct Ranking Report" in Part A and "Color Pie Chart" in Part B.

INPUT FILE

The data to be included in the report are in a CA MICS file. In a direct inquiry, such as the one in Figure 2-44 part A, you need to specify the CA MICS file, the timespan, and the database in which the CA MICS file is located. In a structured inquiry, such as Figure 2-44 part B, you only need to specify the name of an intermediate file (in this case it is FILE1). A separate step places the data in the intermediate file.

REPORT TITLE

Place the title that you want to be used on the report after the Report Title prompt. The default for the report title is the inquiry name.

DATA ELEMENTS TO BE PROCESSED

Each report definition panel will give you the opportunity to specify the data elements to be processed. For the ranking report, specify them following the Rank prompt and the Data Elements to Be Reported prompt. For the pie chart, the Chart of, Charted by, Grouped by, and Weighted by prompts identify the report data elements.

PAGE CONTROL SPECIFICATIONS

Each report definition panel will give you the opportunity to specify where report subheadings and page breaks will occur. Depending on the type of panel, the prompts will vary slightly. In the ranking report example, the element names following the prompt "Print Rankings for Each Value of" let you specify a set of parallel reports. For example, if your installation has three operational systems, executing the above inquiry with SYSID specified after this prompt would produce a separate ranking for each of the three system identifiers.

For the ranking report, you can specify subordinate page breaks and subtotals with the two prompts "Skip to New Page by" and "Generate Subtotals by."

Entering a data element name after the first of these prompts will cause a new page to be generated each time the value of that element changes. Similarly, entering a data element name after the "Generate Subtotals by" prompt will cause subtotals to be generated for each value of that element. Note that the element names you use with these two prompts must be selected from the list following the prompt "Print Rankings for Each Value of."

Note that for the pie graph, there is only one page control prompt, "Generate Graph for Each Value of."

In the example shown in Figure 2-44 part B, a separate pie graph will be generated for each SYSID and hour in the input data.

REPORT-SPECIFIC OPTIONS

The report-specific options are usually self-explanatory. For a ranking report, these options are the report sort order (ascending or descending) and the number of records to be reported. In a pie chart, these options are:

- Whether to graph discrete segments--For numeric plots, you will get a slice for each numeric value. Otherwise the SAS system selects a set of slice midpoints from the range of data. If the data element is character, as in the example above, this parameter is ignored.

- Minimum segment size--The minimum segment size is the smallest percent of the pie for which a separate segment will appear. All smaller values will be put together in a segment called "Other."

The report-specific options are described in detail in the tutorial for each panel.

EXTENDED OPTIONS

If you reply N (the default) to "Specify Extended Options," a number of defaults are automatically assumed. If you reply Y, you are given a chance to review and change the default values. Extended options are described in the next section.

2.6.1.2.2 The Extended Options Panel

Extended options panels are available for all report definition panels. They give you additional flexibility in customizing your reports. Extended options apply only to the inquiry for which they have been specified. They will, however, be saved with the inquiry and will be in effect each time the inquiry is executed.

The extended options panels for corresponding direct and structured inquiries are nearly identical. Both contain the following types of options:

- Printer or color graphics format parameters
- Data element labels (or column headings) and data formats
- Subheading text and data formats
- Report shortening options

In addition, direct inquiry extended options panels include the following set of options that do not appear on the structured inquiry extended options panels:

- Common data selection
- Execution-time data selection
- General data selection
- Data summarization
- Runtime override of database and/or cycles

These functions are treated as separate steps in structured inquiries, and thus do not need to appear as part of the report definition steps.

As with the report definition panels, the extended options panels for different reports have many items in common and some that vary depending on the type of report that you are producing.

For example, extended options available on the Direct Standard List extended options panel that are not available on the Direct Color Star Chart panel are an option to specify column headings and data formats and an option to specify data elements to sum for subtotals. On the other hand, options available on the Direct Color Star Chart extended options panel that are not available on the Direct Standard List panel include an option to override color graphics format parameters and an option to specify the scale parameters for the star. Most of these report-specific options are easily understood in the context of the report that you are defining. All of them are described in detail in the tutorials accompanying each extended options panel.

When you reply Y to "Specify Extended Options" on the Direct Standard List panel, you will see the following menu.

```
--------------------------  Extended Options Menu  --------------------------
Command ===>
Inquiry Step:  Direct Standard List
Input File:    TSO USER ACTIVITY FILE
Specify Common Data Selection                ===> N (Y/N/R)
Specify Execution-Time Data Selection        ===> N (Y/N/R)
Specify General Data Selection               ===> N (Y/N/R)
Specify Data Summarization                   ===> N (Y/N/R)
Override Printer Format Parameters           ===> N (Y/N/R)
Specify Column Headings and Data Formats     ===> N (Y/N/R)
Specify Subheading Text and Data Formats     ===> N (Y/N/R)
Specify Data Elements to Sum For Subtotals   ===> N (Y/N/R)

Allow Run-Time Override of Database ===> N (Y/N) and/or Cycle(s) ===> N (Y/N)
Begin With Record Number ===> ________     Stop After ===> ________ (Records)
-------------------------------------------------------------------------------
```

Figure 2-46. Sample Extended Options Menu

Note that next to each extended option is a prompt followed by three choices: Y/N/R. Y and N stand for Yes and No, respectively. R stands for Reset. If you specify Y next to one of these prompts, a supplementary panel appears on which you can set the extended options indicated by the prompt. If you specify N, you are not taken to the corresponding panel. Any extended options that have already been set on that supplementary panel remain undisturbed and will continue in effect. If you specify R, the extended options specifications on the supplementary panel are reset to their default values.

If extended options have been set for one of the categories on the Extended Options Menu, the word "Specified" appears to the right of the option prompt. When you reset an extended option with the R command, the word "Specified" next to that category is erased.

The options that apply only to direct inquiries are discussed in the section 2.6.2, Creating Direct Inquiries.

The common extended options are each discussed separately below.

PRINTER OR COLOR GRAPHICS FORMAT PARAMETERS

Use the Override Printer or Color Graphics Format Parameters extended options to override the default values. Note that the default values can be permanently changed under the Printer or Color Graphics Format options on the MICF Options menu. By careful selection of your default options, you should find that you rarely need to override the defaults with extended options. In the case of color graphics formats, you will need to specify the color graphics format set before the format parameters will be displayed. A prompt on the extended options panel reminds you to do this.

On the Standard List Printer Format Parameters panel, you can specify the following:

- Contents of report title line 2
- Contents of report title line 3
- Contents of report title line 4
- Center report (Y/N)
- Uniform column alignment (Y/N)
- Double space (Y/N)
- Round subtotals (Y/N)
- Print run date (Y/N)
- Print page numbers (Y/N)
- Print record numbers (Y/N)
- Print number of records (Y/N)
- Missing value character
- Number of blank lines at the top of the page

To override a default, simply type over it.

The format parameters panels for color graphics report definitions are similar but more extensive in order to accommodate the additional choices available when you use color graphics.

DATA ELEMENT LABELS (OR COLUMN HEADINGS) AND DATA FORMATS

You can specify the data element labels that will appear on the graphs with the extended options for color graphics or printer graphics. Similarly, you can specify the column headings to be used in printed reports. In all cases, you can specify the data formats used to report the data.

The default for data element labels is the data element label specified in the CA MICS component definition or a prior File Contents Specification inquiry step. The default for column headings is the data element name. You can specify a column heading for each data element, which is printed on one, two, or three lines. A column heading or data element label can be from 1 to 40 characters long.

Using the data format specifications can greatly enhance the appearance of your output. The default data element formats are specified in the CA MICS component definition or a prior File Contents Specification inquiry step. The format is the SAS format, which will be used to print the data element values. It can be used to increase or decrease the number of columns reserved for the data element in the output.

SUBHEADING TEXT AND DATA FORMATS

Use the Subheading Text and Data Formats extended option to specify subheading text for each control data element. At each control break, the values of the control elements will be listed in subheadings across the page. Each value will be labeled with the data element label specified in the CA MICS component definition, a prior File Contents Specification inquiry step, or on the extended options panel.

You can also use this option to specify an output format for printing each control data element value in the subheadings. The default formats are specified in the CA MICS component definition or a prior File Contents Specification inquiry step. As with data element data formats, the format is the SAS format, which will be used to print the data element values. It can be used to increase or decrease the number of columns reserved for the data element in the output.

REPORT SHORTENING OPTIONS

The report shortening extended options are a convenient way to limit report volume. This option is particularly useful during the development of an inquiry or the initial part of a research project where you can sample information from a large input file.

Two report shortening options are available:

- Begin with Record Number -- this is the first record (record number) from the input file that will be processed. MICF begins with the first record of the file when this option is blank.

- Stop After -- this is the maximum number of records that will be processed. Leave this parameter blank or specify MAX (or M) to process all records.

2.6.2 Creating Direct Inquiries

```
-------------------------  Insert Database Inquiry  -------------------------
```

```
Option ===>
```

```
     Inquiry Name   ===> ADHOC
             Title  ===> Ad hoc Inquiry -  Will Not Be Saved
             Author ===> your name

Catalog Group Name  ===> TSO
              Title ===> TSO Analysis


        1 - Direct Inquiry
              Define a simple, single report inquiry using an output-
              oriented, "single panel" approach.
        2 - Structured Inquiry
              Define an inquiry using a process-oriented, generalized
              (multiple-step) approach.
        3 - User-Written Report
              Add a user-written report to the MICF inquiry catalog.
        4 - Component Report
              Add a component report to the MICF inquiry catalog.
```

```
. . . . . .
```

Figure 2-47. Insert Database Inquiry Panel

The process of creating a direct inquiry is straightforward. You tell MICF that you are about to create an inquiry. Then you give the inquiry a name and assign it to a catalog group. Next you define the inquiry. At this point you can choose to cancel, save, or execute the inquiry. If you decide to execute the inquiry before saving it, you will have an opportunity to cancel, save, or modify it after execution.

Tip: If you have not done so already, we recommend that you invoke MICF and actually create some test inquiries as you read the rest of this section.

To create a direct inquiry, select option 2, Database Inquiries, from the primary MICF menu (see Figure 2-1). This will take you to the Database Inquiries panel (see Figure 2-25). Enter the line command I (Insert) on any line in the Cmd column. You will now see the Insert Database Inquiry panel (Figure 2-47).

On this panel, you can specify the inquiry name (one to six characters), title, and author. Defaults are provided, but you will probably want to override them. The catalog group name and title are copied from the information that applies to the line on which you entered the I. If you want to change either of them, you can do so here.

Note: If you want to change any of the information on this panel later, you will need to make a copy of the inquiry in order to do so.

Since you are creating a direct inquiry, specify option 1 on the Command line at the top of the Insert Database Inquiry panel. You will then see the Direct Inquiry Selection panel (Figure 2-48).

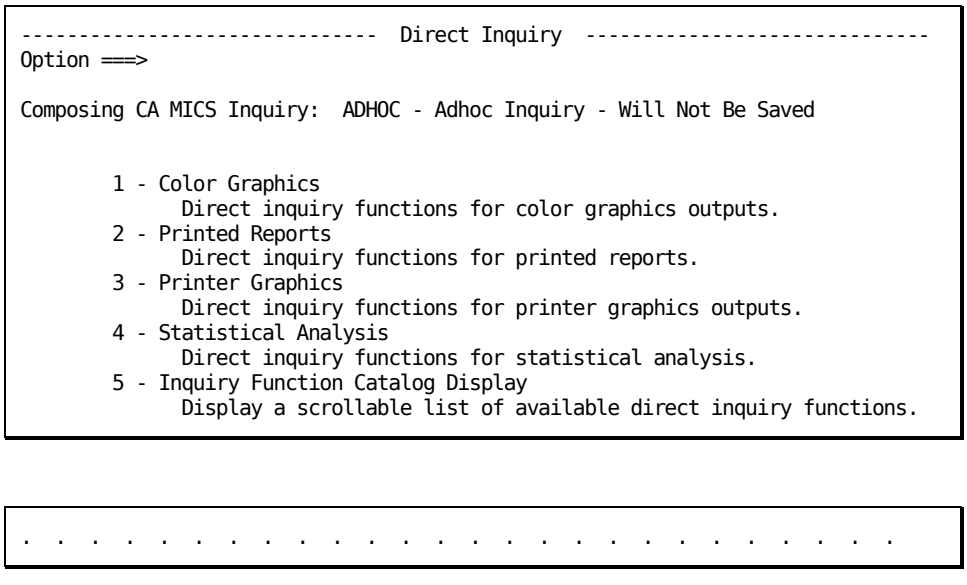


Figure 2-48. Direct Inquiry Selection Panel

At this point you need to do the following:

1 - Select the report to produce.

2 - Select a CA MICS file.

3 - Select data elements to use in the report.

4 - Select extended options (optional).

Each of these tasks is described in a separate section below.

2.6.2.1 Selecting the Report

The first four options on the direct inquiry selection panel are color graphics, printed reports, printer graphics, and statistical analysis. The types of reports in each of these categories are discussed in detail in Section 2.6.1. To choose a report of one of these types, enter the corresponding number in the command area at the top of the panel. You will then see a menu with the list of reports of the type you chose. Select one of these and you will be on the appropriate report definition panel.

Another way to select a report and reach the corresponding report definition panel is to select the last option on the direct inquiry selection panel, Inquiry Function Catalog Display. This option displays a scrollable list of all the direct report types available through MICF. To select one, enter S next to the report name in the Cmd column. You will then see the corresponding report definition panel.

Once you have reached a reports definition panel, you need to select the CA MICS file and the data elements in the file to be used in the inquiry. These topics are covered in the next two sections. You can also do some report customization on this panel and additional customization on the extended options panel. Customizing MICF reports was discussed in Section 2.6.1.2 above.

2.6.2.2 Selecting a CA MICS File

```
---------------------------  CA MICS File Selection --------------------------
-
Command ===>                                                  Scroll ===> CSR
 Inquiry Step:  Direct Color Pie Chart
 CA MICS File ===> ? (fff) Timespan ===> ______
Database     ===> _
      -Database -  Info.  CA MICS  Information Area ===> ___ (iii)   Timespans
Cmd  ID   Label   Area   File                                        X D W M Y A
 -   -- --------   ---   ---  ------------------------------------ - - - - - -
 _                ADM        ADMINISTRATIVE
 _                BAT        BATCH ACTIVITY
 _                CIC        CICS
 _                HAR        HARDWARE ACTIVITY
 _                OPS        OPERATIONS INFORMATION
 _                SCP        MVS SCP ACTIVITY
 _                TSO        TSO ACTIVITY
****************************** BOTTOM OF DATA *********************************
```

Figure 2-49. CA MICS File Selection Panel

Selecting a CA MICS file is very easy whether or not you know the CA MICS file name and database identifier.

If you know the three-letter code for the CA MICS file that you want, simply enter it after the CA MICS File prompt on this menu. The three-letter code is the file level definition (fff) shown in the CA MICS product guides. These codes are also the last three characters of the file name shown in the file directory in the CA MICS product guides.

If the CA MICS file you want exists in more than one database in your installation, enter the database identifier (a one-character code) after the Database prompt. If the file exists in only one database, MICF will automatically supply the database identifier. Also enter the timespan and cycles to be reported. MICF will display the file name (the file title or long name) for you after you have specified the CA MICS file.

If you are not sure of the CA MICS file name that you want to use, enter a question mark (?) after the CA MICS File prompt. MICF will display the CA MICS File Selection panel (Figure 2-49).

Select the information area in which you are interested either by entering an "S" next to the name of the information area in the Cmd column or by entering the three letter identifier after the Information Area prompt. MICF will then display a list of the files in that information area and the timespans in which they exist. Select one of these files either by entering an "S" in the Cmd column or by entering the three letter identifier after the CA MICS File prompt.

If the file exists for only one timespan, MICF will put that timespan after the Timespan prompt. If more than one timespan is available, MICF will prompt you with a message like this:

Valid Timespans for this CA MICS File: DAYS, MONTHS.

Enter one of the valid timespans.

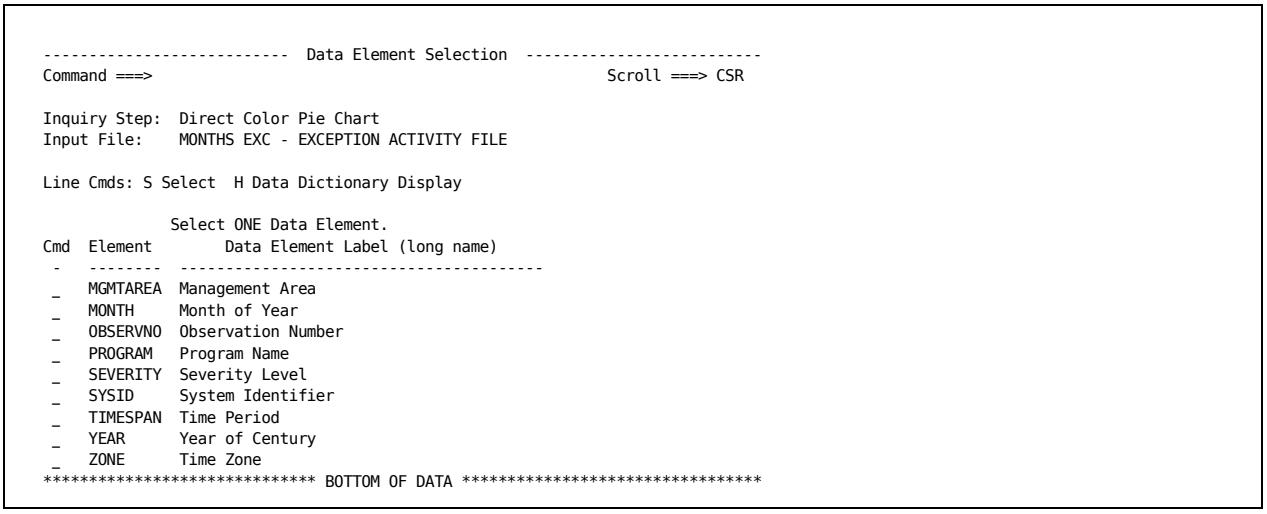
If the file exists in only one database, MICF will automatically fill in the database identifier. If it exists in more than one database, MICF will display a list of valid databases and prompt you to select the one to use.

After you have completed all the blanks on this panel, return to the report definition panel on which you typed the question mark by pressing END. The question mark will be replaced with the file identifier you selected. Timespan, database, and file name will also be completed.

Note: If you want to return to the report definition panel without making any choices, enter CANCEL on the Command line at the top of the panel.

Tip: If you know some, but not all, of the information available through the CA MICS file selection process, you can enter the information you know and use a question mark for the items for which you need assistance.

2.6.2.3 Selecting Data Elements



```
--------------------------  Data Element Selection  -------------------------
Command ===>                                              Scroll ===> CSR

Inquiry Step:  Direct Color Pie Chart
Input File:    MONTHS EXC - EXCEPTION ACTIVITY FILE

Line Cmds: S Select  H Data Dictionary Display

              Select ONE Data Element.
Cmd  Element        Data Element Label (long name)
 -   --------  ----------------------------------------
 _   MGMTAREA  Management Area
 _   MONTH     Month of Year
 _   OBSERVNO  Observation Number
 _   PROGRAM   Program Name
 _   SEVERITY  Severity Level
 _   SYSID     System Identifier
 _   TIMESPAN  Time Period
 _   YEAR      Year of Century
 _   ZONE      Time Zone
****************************** BOTTOM OF DATA ********************************
```

Figure 3-48. Sample Data Element Selection Panel

Figure 2-50. Sample Data Element Selection Panel

Data element selection operates the same way as file selection:

- If you know the elements that you want to use in the report, enter their names after the appropriate prompts.

- If you want to see a list of the elements available in the file that you have selected, enter a question mark (?) after one of the data element prompts on the report definition panel. You will see a scrollable list of element names, such as that shown in Figure 2-50.

Entering H in the Cmd column next to a data element on this list will show you the data dictionary entry for that element. Entering S will return you to the report definition panel, where the selected element will replace the question mark that you entered.

If you entered a question mark after a prompt for which more than one data element can be selected, you can select multiple data elements on the data element selection panel. Entering S will cause the word "Selected" to be displayed next to the data element. When you return to the report definition panel by entering END, the selected data elements will be entered onto the report definition panel in the order in which you selected them on the data element selection panel.

To leave the data element selection panel without selecting any data elements, enter CANCEL in the Command area at the top of the panel.

2.6.2.4 Selecting Extended Options

Direct inquiries are designed to let you get usable results from CA MICS by specifying a limited amount of information on a single panel. The information that you specify on the primary panel for each direct inquiry allows you to perform a small amount of report customization. Extended options provide you with a means of further customizing your reports.

To select extended options, respond Y to this prompt at the bottom of the screen: Select Extended Options. Direct inquiries have two types of extended options:

- Report formatting options
- Data manipulation options

The report formatting options are the same for both direct and structured inquiries and are discussed in Section 2.6.1.2.2 above. The data manipulation options are discussed below. Note that these are similar to the data manipulation steps used in structured inquiries. For additional detail on data manipulation options, refer to the structured inquiry discussion in Section 2.6.3.2 below.

The following appear as extended options only in direct inquiries:

- Common data selection
- Execution-time data selection
- General data selection
- Data summarization
- Allow runtime override of database and cycles

Each of these options is discussed separately below.

COMMON DATA SELECTION

Use the Common Data Selection extended option to select a subset of the observations from the CA MICS file. You can limit the file based on date, time, zone, record numbers, or on combinations of these variables.

EXECUTION-TIME DATA SELECTION

Use the Execution-time Data Selection extended option to allow dynamic, execution-time specification of the values upon which to limit the file. This allows you to compose a general inquiry that you can then temporarily customize each time you execute.

With this option, you can select data based on data element values being equal to, greater than (or equal to), less than (or equal to), or not equal to an argument that you specify just before the inquiry is executed. You can define both inclusive and exclusive comparison conditions. Comparisons can be restricted to the leading characters of character valued variables.

You write your own user prompt on the Execution-time Data Selection extended options panel. MICF then displays this prompt after you tell it to execute the inquiry. After you reply to the prompt, MICF executes the inquiry.

GENERAL DATA SELECTION

The General Data Selection extended option lets you extend the Common Data Element Selection process to any CA MICS data element in the file that you are analyzing. A full range of Boolean operators is allowed the same way they are used in the Execution-time Data Selection.

DATA SUMMARIZATION

The Data Summarization extended options panel provides space to specify 15 data elements as the file sequence keys. The file will be sorted in sequence by the specified keys (from top to bottom) and then summarized to the granularity of the last data element in the list. Two data entry fields are provided for each sequence key. Specify the eight-character data element name in the first field. The data element name must correspond to a data element name in the input file. Specify a question mark (?) for a list of valid data elements.

The second data entry field is used to specify the sort sequence for that data element. Specify D to request that the file be sorted in descending order by this data element. Leave the second field blank or specify A to request ascending order for this data element (which is the default).

The panel comes with the sequence of the input file. The most common scenario is to drop data elements from the end of the list to reduce the granularity of the input file for reporting purposes. You can drop elements from the front or middle of the list by simply blanking them out. Blank entries in the middle of the list are NOT a problem.

ALLOW RUNTIME OVERRIDE OF DATABASE AND/OR CYCLES

If you select the Allow Runtime Override of Database extended option, MICF will prompt you just prior to executing the inquiry for the unit database to use in the inquiry. The default (if one was specified) is shown and you can accept it by simply pressing END.

Similarly, if you select the Allow Runtime Override of Cycles extended option, MICF will prompt you before executing the inquiry and give you a chance to override the default value.

If you select both of these extended options, the execution-time prompts appear on the same panel and you can choose to change both of them, one of them, or neither of them.

Note that if you indicate Y (Yes) after the Allow Runtime Override of Database and/or Cycles prompts, you can leave the Database and/or Cycle prompts blank on the primary report definition panel.

2.6.2.5 Sample Completed Direct Inquiry

```
--------------------------  Direct Color Pie Chart  --------------------------
Command ===>
Composing CA MICS Inquiry: DS1  - Exception Counts by Zone
Inquiry Step ===> Direct Color Pie Chart
CA MICS File ===> EXC (fff)  Timespan ===> MONTHS Cycle(s) ===> 00 - __
Database     ===> P  (PRIMARY)  File Name: EXCEPTION ACTIVITY FILE
Report Title ===> Exception Counts by Zone
Chart of      ===> EXCCOUNT (Value)    Grouped by  ===> ________ (Pies)
Charted by    ===> ZONE     (Slices)   Weighted by ===> ________ (Element)
Generate Graph for Each Value of   ===>     SYSID     _ ________ _ ________ _
________ _ ________ _ ________ _ ________ _ ________ _ ________ _ ________ _
Graph Discrete Segments   ===> N (Y/N)
Minimum Segment Size (%)  ===> ___ (0 - 100)


Specify Extended Options ===> N (Y/N)
--------------------------------------------------------------------------------
```

Figure 2-51. Sample Completed Direct Inquiry

A sample of a completed direct inquiry is shown in Figure 2-51. This inquiry produces a color pie chart for each SYSID in which each pie slice represents a different zone (for example, prime shift, night shift, weekend shift) and the size of each slice is determined by the number of exceptions counted during that zone. The data are drawn from the exception file, EXC, and are summarized to the months timespan in the primary database. The most recent data cycle (00) is used for the graph, which represents the exception counts for the month to date.

2.6.3 Creating Structured Inquiries

Creating a structured inquiry is easy. You tell MICF that you are about to create an inquiry. Then you give the inquiry a name and assign it to a catalog group. Next you define the steps that make up the inquiry. At this point, you can choose to cancel, save, or execute the inquiry. If you decide to execute the inquiry before saving it, you will have an opportunity to cancel, save, or modify it after execution.

Note: If you have not done so already, we recommend that you invoke MICF and actually create some test inquiries as you read the rest of this section.

To create a structured inquiry, select option 2, Database Inquiries, from the primary MICF menu (see Figure 2-1). This will take you to the Database Inquiries panel (see Figure 2-25). Enter the line command I (Insert) on any line in the Cmd column. You will now see the Insert Database Inquiry panel (Figure 2-47).

On this panel you can specify the inquiry name (one to six characters), title, and author. Defaults are provided, but you will probably want to override them. The catalog group name and title are copied from the information that applies to the line on which you entered the I. If you want to change either of them, you can do so here.

Note: If you want to change any of the information on this panel later, you will need to make a copy of the inquiry in order to do so.

Since you are creating a structured inquiry, specify option 2 on the Command line at the top of the Insert Database Inquiry panel. You will then see the Structured Inquiry selection panel (Figure 2-53).

```
------------------------  MICF Inquiry Step Display  ------------------------
```

```
Command ===>                                                Scroll ===> CSR

Modifying CA MICS Inquiry: TSOLD1 - Daily TSO User Ranking Reports
```

```
Execute ===> N (Y/N)     Execution Mode ===> BATCH      (BATCH/FOREGROUND)

Line Cmds: S Select  I Insert  D Delete  M Move  R Repeat  C Copy

Cmd                          Inquiry Step                            Input File
 -   ------------------------------------------------------------  -----------
```

```
 _   CA MICS File Selection                                          DAYS TSU
 _   Common Data Selection - Select Previous Day                    FILE1
 _   Execution-Time Data Selection - Select SYSID                   FILE1
 _   Execution-Time Data Selection - Select ZONE                    FILE1
 _   Execution-Time Data Selection - Select HOUR                    FILE1
 _   Data Element Derivation - Compute TSOPCSR                      FILE1
 _   Ranking Report - Top 5 Resource Consumers by Hour              FILE1
 _   Ranking Report - Top 5 Throughput by Hour                      FILE
 _   Execution-Time Data Selection - Restrict for Resp. Ranking     FILE1
 _   Ranking Report - Worst 5 Response by Hour                      FILE1
****************************** BOTTOM OF DATA ********************************
```

```
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Figure 2-52. MICF Inquiry Step Display

Note: If you had selected an existing structured inquiry and were in the MODIFY mode, you would see the MICF step display panel for that inquiry. The step display panel lists each of the steps in the inquiry (see Figure 2-52). It is created automatically as you define a structured inquiry. You can add additional steps to an inquiry by using the I (Insert) line command. When you do so, you will see the Structured Inquiry Menu (Figure 2-53).

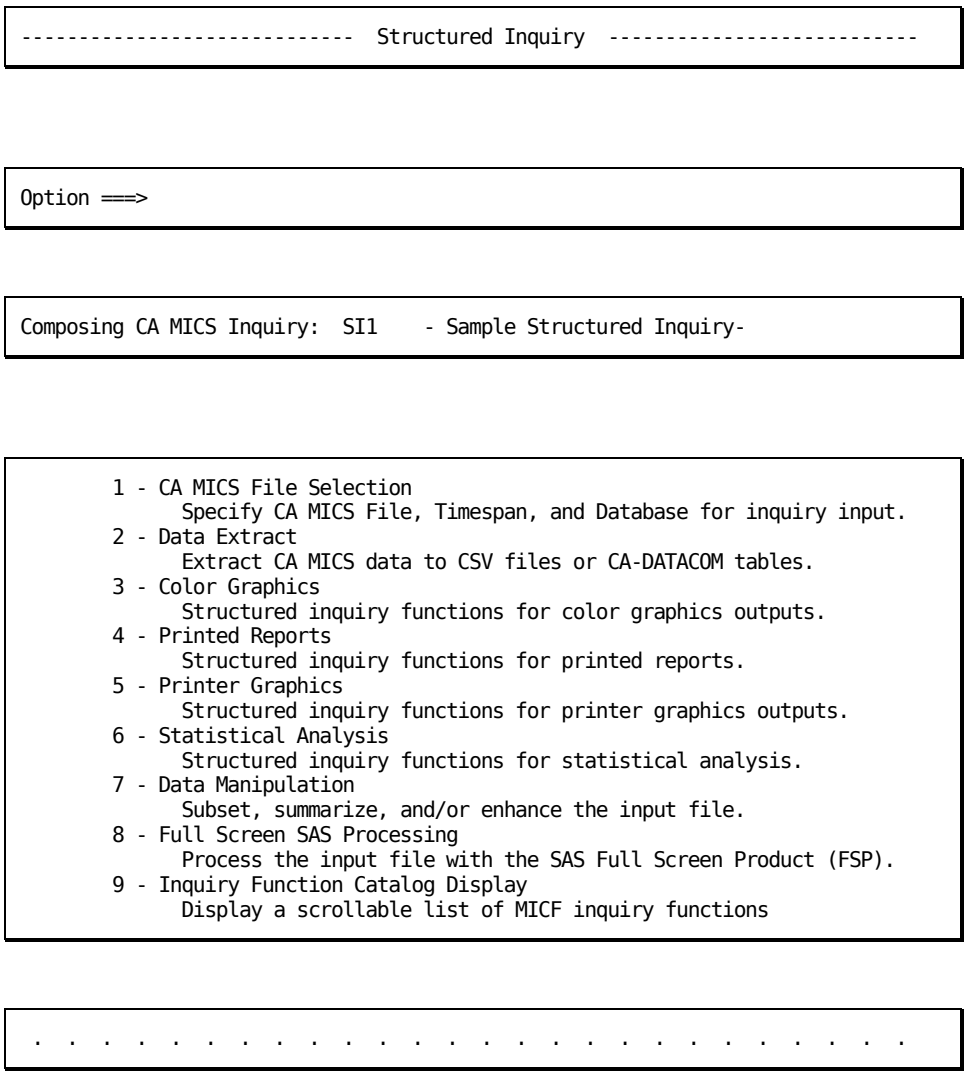


Figure 2-53. Structured Inquiry Menu

Option 1, CA MICS File Selection on this menu is similar to the CA MICS files selection operation described in the section on creating direct inquiries (Section 2.6.2). The major difference is that this option is a stand-alone function when creating structured inquiries, not part of the report definition panel.

Option 2 lets you extract CA MICS data to CSV files and CA Datacom tables.

Options 3, 4, 5, and 6 are options discussed above under Selecting Reports (Section 2.6.1).

Option 7 provides a number of optional data manipulation tools that let you subset, sort, and summarize files. In addition, you can add elements to the data in a file, combine files, and change data element labels and formats.

Option 8, Full Screen SAS Processing, lets you use the SAS Full Screen Product to browse and edit intermediate files.

Option 9, Inquiry Function Catalog Display, is a scrollable list of all the MICF features you can reach from the other options on this panel.

At this point you need to:

1 - Select one or more CA MICS files to analyze (required).

2 - Manipulate the data (optional).

3 - Select the reports to produce (required).

Each of these tasks is described in a separate section below.

2.6.3.1 Selecting CA MICS Files to Analyze

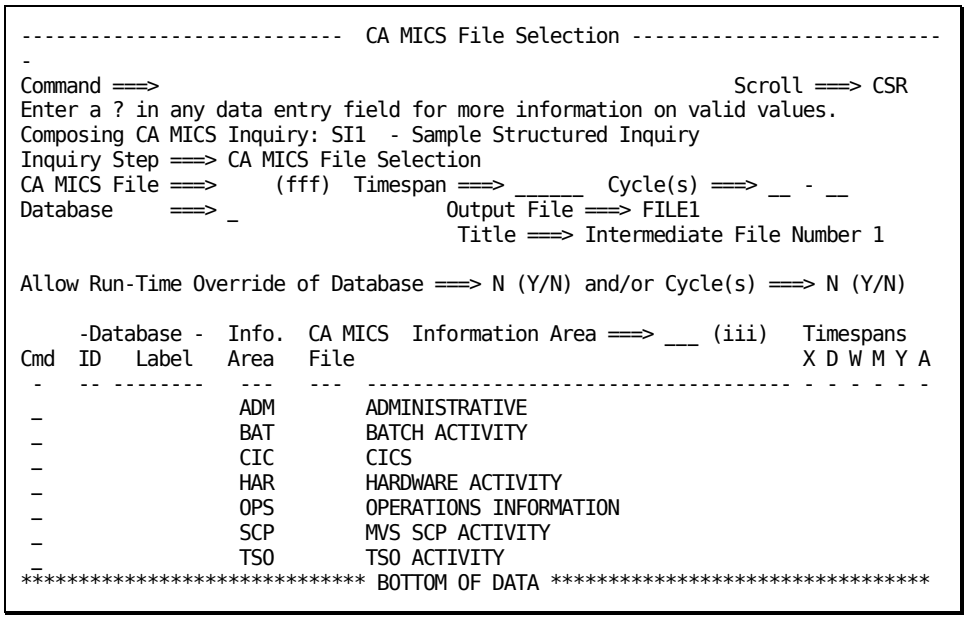


Figure 2-54. CA MICS File Selection Panel for Structured Inquiries

The first step in the creation of a structured inquiry is to select the CA MICS file or files to analyze. As part of this step, you must also specify the timespan, cycles, and database to be used in the analysis. When it executes this step, MICF will create an intermediate file. This intermediate file is the input file used by later data manipulation and reporting steps.

To select a file, specify option 1, CA MICS File Selection, on the Structured Inquiry menu. You will then see the CA MICS File Selection panel that is used for structured inquiries (Figure 2-54).

This panel is nearly identical to the CA MICS File Selection panel that appears when you use question-mark help on a Direct Inquiry definition panel. The difference is that three fields, CA MICS File Cycles, Output File, and Output File Title, have been added. Also, the prompts have been added to allow you to specify that the database and/or file cycles can be overridden when the inquiry is executed.

When you allow execution-time overrides, you do not need to specify the database or cycles on the file selection panel. Instead, MICF will prompt you for this information on the Execution-Time Parameter Specification panel that will be displayed before the inquiry is executed.

The CA MICS File Selection panel is in two parts:

o Specifications are entered in the upper half of the panel.

o The lower half of the panel is a scrollable display that aids you in the specification of CA MICS file, timespan, and database.

When this function is first selected, the scrollable display provides a list of the Information Areas available in your CA MICS complex.

The two parts of the CA MICS File Selection Panel are discussed in the following two sections.

1 - The Scrollable Display
2 - Completing the CA MICS File Selection Panel

2.6.3.1.1 The Scrollable Display

The CA MICS File Selection scrollable display helps you select the proper CA MICS file, timespan, and database to meet your inquiry requirements. The contents of this display vary depending on the values currently specified for CA MICS file, timespan, and database.

When CA MICS file, timespan, and database are all blank (for example, when the panel is displayed for the first time), the scrollable display lists the Information Areas available in your CA MICS complex. You can select an information area by coding an S (for Select) in the line command field on the line of the display containing the desired information area. Alternatively, you can enter the three-character Information Area identifier in the Information Area data entry field (in the title area of the scrollable display).

When an Information Area is selected, the display will list the CA MICS files in the specified Information Area. This listing includes the valid timespans for each file to the right of the file title or long name. If a column contains a period (.), then the file is not active in the corresponding timespan. Otherwise the column will contain X, D, W, M, Y, or A to indicate that the file is active in the Detail, Days, Weeks, Months, or Years timespan or in an application database. You can select a CA MICS file by coding an S (for Select) in the line command field on the line of the display corresponding to the desired file.

When a CA MICS file is selected, the display will list the unit databases containing that CA MICS file. You can select a unit database by coding an S (for Select) in the line command field on the line of the display corresponding to the desired unit database.

Numerous alternative selection scenarios are available. Simply enter a question mark (?) in the field for which you would like to see the valid values. For example, if file and Information Area are blank, you can enter a question mark after Database to list the unit databases in your CA MICS complex. When you select the desired unit database, a list of the Information Areas defined in that unit database will be displayed.

2.6.3.1.2 Completing the CA MICS File Selection Panel

The following fields must be completed on this panel:

- Inquiry Step
- CA MICS File
- Timespan
- Cycles
- Database
- Output File
- Allow Runtime Override

The title field is optional. Each of these fields is discussed below.

INQUIRY STEP

Inquiry Step defaults to "CA MICS File Selection," the description displayed on the step selection panel. It is included for your convenience. You can specify a more meaningful label for the inquiry step, which can be up to 60 characters in length.

CA MICS FILE

CA MICS File is a three-character CA MICS file name. It is the name of the CA MICS database file from which the inquiry is to extract data.

TIMESPAN

After the Timespan prompt, enter the timespan from which the inquiry is to extract data from the specified CA MICS file. Code a question mark (?) for a list of the valid timespans for the specified CA MICS file. If the CA MICS file exists in only one timespan, then MICF will automatically set the timespan specification. Timespan can take the values DETAIL, DAYS, WEEKS, MONTHS, YEARS, or APPL. These values can be abbreviated as X or DE, D, M, Y, or A, respectively.

CYCLES

Cycles must be entered after the Cycle(s) prompt unless execution-time override is allowed. It defaults to 01 if timespan is DETAIL, DAYS, or APPL. It defaults to 00 if timespan is WEEKS, MONTHS, or YEARS. This is the cycle or cycles of the specified CA MICS file and timespan from which the inquiry is to extract data. Two data entry fields are provided so that a range of cycles can be specified. Both fields can contain any numeric value between 0 and 99. If only a single cycle (for example, cycle 01) is desired, specify the selected cycle in the first entry field and leave the second field blank. Leading zeros are not required; MICF automatically inserts leading zeros if a single digit number is supplied (for example, 7 becomes 07). You can specify cycle ranges in either ascending or descending order (for example, 01 - 05 or 05 - 01). The files are processed in the order that you specify. Note that descending order (for example, 03 - 01) is frequently more efficient than ascending order because less sorting is required.

DATABASE

Database must be entered unless you have selected execution-time override for the database. Enter the one-character database ID for the unit database in which the CA MICS file that you need exists. If the CA MICS file exists in only one unit database, then MICF sets this parameter automatically.

OUTPUT FILE

The entry that you make after the Output File prompt is the name of the intermediate file created by this inquiry step. It will be specified as the input file for subsequent data manipulation and reporting steps. If this file is to be saved for input to later inquiries, then this is the actual name under which the file will be cataloged. The value defaults to FILEn, where n is the next intermediate file number (for example, FILE1 for the first intermediate file, FILE2 for the second, etc.). The name must be 1 to 8 characters and must NOT begin with an underscore (_). Because MICF adds its own prefix to your file names, you do not need to ensure that file names are distinct from other CA MICS file names. If you leave this field blank, MICF will prompt you to complete it before you leave the panel.

ALLOW RUNTIME OVERRIDE

Two fields are provided for specifying whether or not the database and file cycles specification can be overridden when the inquiry is executed. Both fields default to N (No). Specify N (No) to lock this step to the specified database and/or cycles. Specify Y (Yes) to allow the database and/or cycles to be changed at inquiry execution. The two fields are independent. In other words, you can allow database override without allowing cycles override (for example, specify Y for database override and N for cycles override). If database override is N, then database must be specified. If database override is Y, then database may be blank. If cycles override is N, then at least one cycle must be specified. If cycles override is Y, then cycles may be blank.

TITLE

The title for the intermediate file is optional. It defaults to "Intermediate File Number n," where n is the file name suffix as above. This is the intermediate file title or "long name" displayed on various inquiry composition panels and the saved file catalog. It is included for your convenience to provide a more meaningful label for the CA MICS file. It can be 1 to 30 characters long.

2.6.3.2 Manipulating CA MICS Data

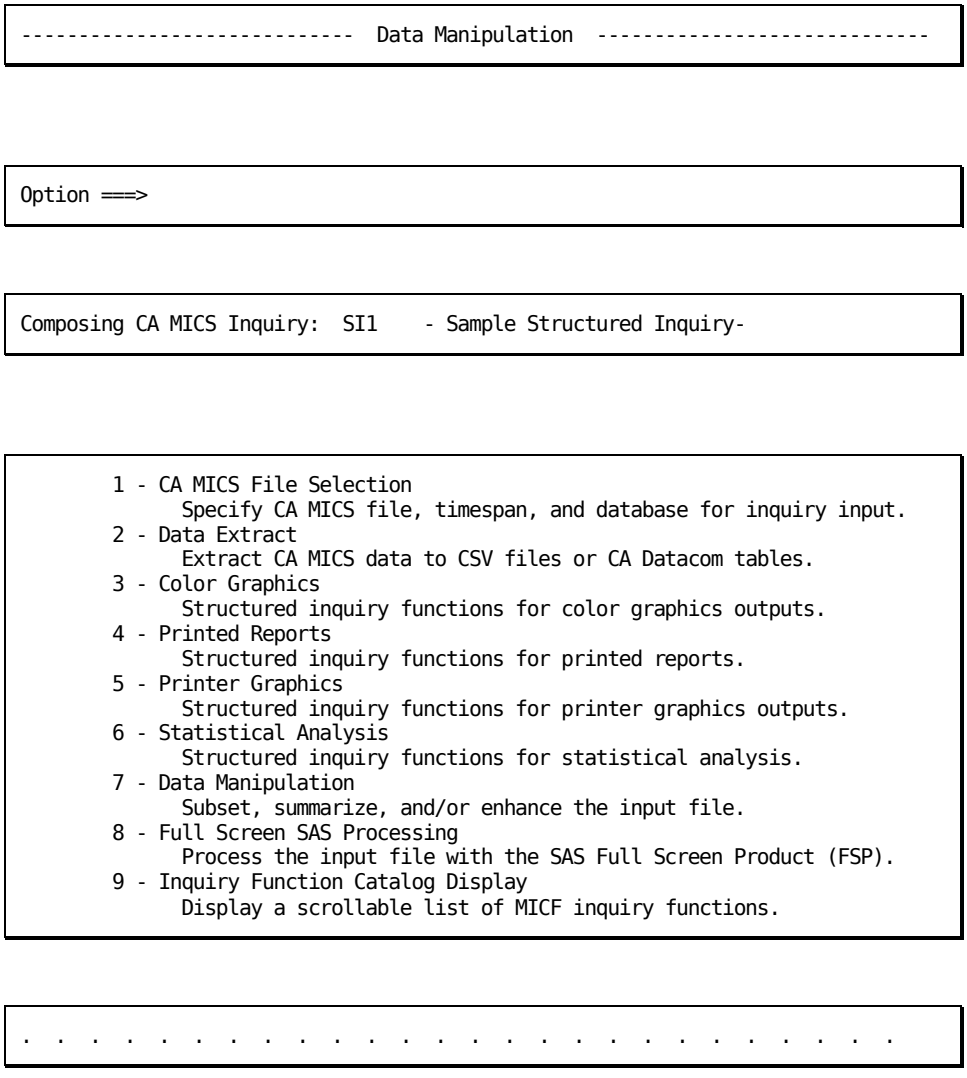


Figure 2-55. Data Manipulation Menu

MICF provides you with a wide variety of data manipulation facilities. The use of each of these facilities is optional. One of these facilities, General Data Selection, is used frequently enough that it has been made an option on the Structured Inquiry menu. The remaining data manipulation facilities are on the Data Manipulation menu (Figure 2-55).

Conceptually, there are three major types of data manipulation facilities:

1 - Subsetting CA MICS files, which consists of common data selection, general data selection, and execution-time data selection

2 - Data summarization

3 - Deriving new data elements

You will need the remaining three groups of data manipulation facilities less frequently:

4 - Advanced Data Manipulation

5 - Saved Files Facilities

6 - External File Facilities

Each of these facilities is discussed separately below.

2.6.3.2.1 Subsetting CA MICS Files

To subset a CA MICS file is to select only some of the observations from the input file. There are three standard ways to subset a CA MICS file in MICF:

1 - Common Data Selection
2 - General Data Selection
3 - Execution-time Data Selection

Each of these techniques is discussed below.

2.6.3.2.1.1 Common Data Selection

```
--------------------------  Common Data Selection  --------------------------
Command ===>
Enter a ? in any data entry field for more information on valid values.
Composing CA MICS Inquiry: SSI     - Sample Structured Inquiry
Inquiry Step ===> Common Data Selection
Input File   ===> FILE1     (From:  DAYS TSU   )     Output File ===> FILE1

     Time frame ===> ________ (CURRENT/PREVIOUS) ===> _____ (DAY/WEEK/MONTH)

     Date     ===> _______     to ===> _______     (ddmonyy)
     Time     ===> __________  to ===> __________  (hh:mm:ss.hs)
     Year     ===> __          to ===> __          (Last Two Digits)
     Month    ===> __          to ===> __          (1-13)
     Day      ===> __          to ===> __          (1-31)
     Week     ===> __          to ===> __          (1-53)
     Hour     ===> __          to ===> __          (0-23)
     Zone     ===> _ _ _ _ _ _ _ _ _              (1-9)
     Dayname  ===> ___ ___ ___ ___ ___ ___ ___    (Sun, Mon, Tue, ..)
     SYSID    ===> ____ ____ ____ ____ ____ ____  (1-4 Character System-id)

        Start After ===> ________ (Skip the first N records in the file)
        Stop After  ===> ________ (Stop processing file after N records)
        Skip Factor ===> ________ (Select every Nth record in the file)
-------------------------------------------------------------------------------
```

Figure 2-56. Common Data Selection Panel

Common data selection is used to subset the input file based on date, time, system, zone, and record numbers. You can use combinations of these factors in the subsetting process.

If you choose the Common Data Selection option from the Structured Inquiry menu (Figure 2-53), you will see the Common Data Selection panel (Figure 2-56).

```
--------------------------  Common Data Selection  --------------------------
Command ===>

Composing CA MICS Inquiry: SSI     - Sample Structured Inquiry
Inquiry Step ===> Common Data Selection
Input File   ===> FILE1     (From:  DAYS TSU   )     Output File ===> FILE1

     Time frame ===> PREVIOUS (CURRENT/PREVIOUS) ===> WEEK  (WEEK/MONTH)

     Date    ===> _______     to ===> _______     (ddmonyy)
     Time    ===> __________  to ===> __________  (hh:mm:ss:hs)
     Year    ===> __          to ===> __          (Last Two Digits)
     Month   ===> __          to ===> __          (1-13)
     Day     ===> __          to ===> __          (1-31)
     Week    ===> __          to ===> __          (1-53)
     Hour    ===> __          to ===> __          (0-23)
     Zone    ===> _ _ _ _ _ _ _ _ _ _            (1-9)
     Dayname ===> ___ ___ ___ ___ ___ ___ ___    Not In File
     SYSID   ===> PTSO ETSO ____ ____ ____ ____  (1-4 Character System-id)

        Start After ===> ________ (Skip the first N records in the file)
        Stop After  ===> ________ (Stop processing file after N records)
        Skip Factor ===> ________ (Select every Nth record in the file)
------------------------------------------------------------------------------
```

Figure 2-57. Sample of a Completed Common Data Selection Panel

The Common Data Selection function provides the following capabilities:

- Select data for the previous day, current or previous week, or current or previous month. This is the "time frame selection" facility, which provides dynamic date-based selection for file subsetting. The data selected through common data selection are a subset of the data specified after the timespan prompt on the file selection panel.

- Select data based on date, time, year, month, day, week, hour, and/or day of the week (Dayname).

- Select data based on Zone.

- Select data based on system (SYSID).

- Select data following the nth record, select data until the nth record, and/or select every nth record (for example, start, stop, and skip).

If multiple selection criteria are specified, a file observation must meet ALL of the specifications to be kept. If only one specification is missed, the record is dropped.

As with other MICF panels, the Inquiry Step defaults to the inquiry function name, but you have the option of providing a more descriptive name. This is the name that will appear as the inquiry step name on the MICF Inquiry Step Display panel.

The input file defaults to the output file of the previous inquiry step. The output file defaults to the input file. You can override these values by entering appropriate file names after the corresponding prompts. The output file names must follow the rules discussed in section 2.6.3.1.2 above.

Figure 2-57 is an example of a Common Data Selection panel completed to select the data from the week before the one on which the inquiry is run (the default). Since there are also two entries after the SYSID prompt, only data from the PTSO or ETSO systems will be used.

2.6.3.2.1.2 General Data Selection

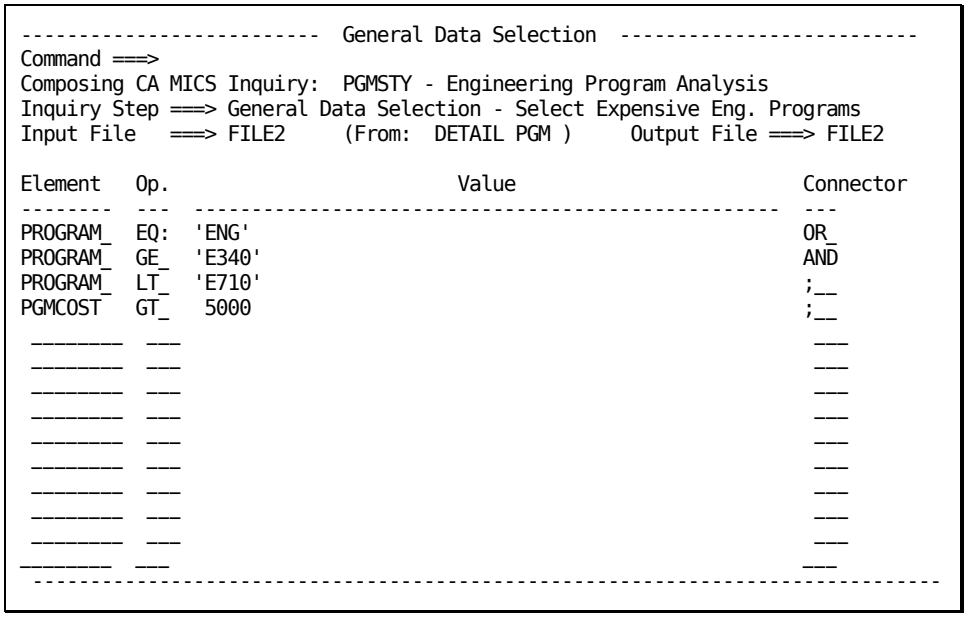


Figure 2-58. Sample of a Completed General Data Selection Panel

The General Data Selection panel lets you extend the Common Data Selection process to any CA MICS data element in the file that you are analyzing. A full range of Boolean operators is allowed. The General Data Selection option allows selection based on data element values being equal to, greater than, greater than or equal to, less than, less than or equal to, or not equal to a specified value. You can specify compound conditions connected by AND or OR. In addition, you can restrict the comparisons to the leading characters of character-valued variables. Figure 2-58 is an example of a completed General Data Selection panel.

Complete the inquiry step, input file, and output file fields as in other MICF panels. The remaining fields are each discussed separately below:

- Element
- Op.
- Value
- Connector

ELEMENT

Complete the element field with the name or names of the data elements whose values are to be used in the comparisons.

OP.

The op. field is the operator field. Complete it with the logical operator to be used in the comparison. Valid operators are:

- EQ -- Equal to (the default operator)
- GT -- Greater than
- GE -- Greater than or equal to
- LT -- Less than
- LE -- Less than or equal to
- NE -- Not equal to

For character data elements, the operator can be followed by a colon (:) to indicate that the comparison is to be limited to leading characters. For example, this general data selection entry will select user identifiers whose values start with the character string XYZ:

```
USER EQ:  'XYZ'
```

VALUE

Value is the conditional test value. It can be a literal, an input file data element, or a SAS global variable. Value specifications will be translated to uppercase unless you have specified (in your User Profile Parameters) that all value type fields can contain lowercase characters. Literal values will be checked for compatibility with the data element type and length. For example, values for numeric data elements must be numeric. Character literals must be enclosed in single quotes. Date and time literals will be converted to valid SAS literal formats. They do NOT need to be entered with quotes and type indicators. For example, 10:00:00 and '10:00:00'T are both valid specifications for ten hours for a time data element.

CONNECTOR

The connector can be AND, OR, or a semicolon (;). A semicolon (the default) terminates the list of conditions in a general data selection statement. Compound conditions are evaluated from top to bottom; however, conditions connected with AND are processed before those connected with OR. For example, the following condition will be true if B2=Y2 and C3=Z3 are true:

```
A1 EQ X1 OR
B2 EQ Y2 AND
C3 EQ Z3 ;
```

It will also be true if A1=X1 is true. If multiple general data selection statements ending with a semicolon are included, the record will be dropped if ANY of the statements is false. For example, in Figure 2-58, if PGMCOST is less than 5000, the record will be dropped even if it meets the conditions on the first four condition lines on the panel. Conversely, if the first general data selection statement fails (the statement consisting of the first four conditions), the record will be dropped even if PGMCOST is greater than 5000.

2.6.3.2.1.3 Execution Time Data Selection

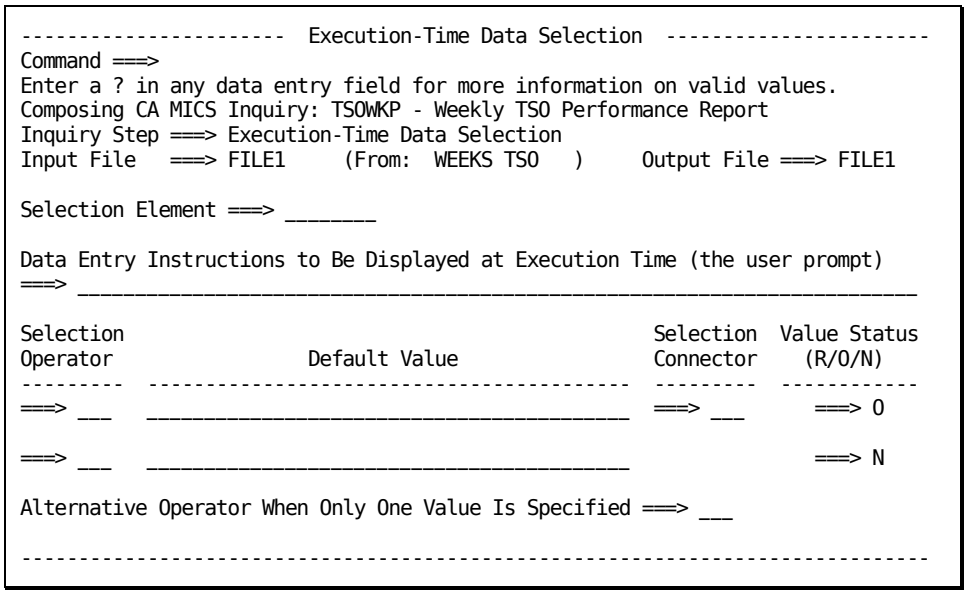


Figure 2-59. Execution-Time Data Selection Panel

You can also specify execution-time data selection with a flexible set of Boolean operations by selecting the Execution-Time Data Selection option (option 3) from the Data Manipulation panel. A blank Execution-Time Data Selection panel is shown in Figure 2-59 and a completed Execution-Time Data Selection panel is shown in Figure 2-60.

```
----------------------  Execution-Time Data Selection  ----------------------
Command ===>

Composing CA MICS Inquiry: TSOWKP - Weekly TSO Performance Report
Inquiry Step ===> Execution-Time Data Selection - Select Zones
Input File   ===> FILE1     (From:  WEEKS TSO  )     Output File ===> FILE1

Selection Element ===> ZONE

Data Entry Instructions To Be Displayed At Execution Time (the user prompt)
===> Specify the Zone or Range of Zones to be reported (values from 1-9).

Selection                                              Selection  Value Status
Operator                Default Value                  Connector    (R/O/N)
---------  ----------------------------------------  ---------  ------------
===> GE    1                                          ===> AND      ===> R

===> LE    4                                                        ===> O
Alternative Operator When Only One Value is Specified ===> EQ
--------------------------------------------------------------------------------
```

Figure 2-60. Sample of a Completed Execution-Time Data Selection Panel

The Execution-Time Data Selection Panel shown in Figure 2-60 prompts you to specify the zone or range of zones to be reported. The defaults are 1 (the lower bound) and 4 (the upper bound).

The Selection Element is the data element used for execution time selection processing. Enter a question mark (?) in the Selection Element field for a list of valid element names.

Note: When Selection Element is YEAR, data values are automatically converted to 4-digit year format in the generated SAS statements. The displayed data value is not altered. With this special feature, you can enter 2-digit (for example, 01), 3-digit (101), or 4-digit (2001) values for execution-time data selection against the CA MICS YEAR element.

The instructions that you enter following the prompt "The Data Entry Instructions to Be Displayed at Execution Time" will be displayed when the inquiry is executed. These instructions can be up to 73 characters long. Clearly indicate what should be entered. When it is practical, list the valid values.

The next section of the panel defines the data selection operation that allows both specific value and range selection (for example, select Zone 2 or select Zones 1 to 4). It has two rows of parameters that define the two data entry fields that are displayed at inquiry execution. The first row defines the data entry field for specific value selection. This is also the low value for range selection. The second row defines the data entry field for the range selection high value. Parameter contents vary depending upon whether the corresponding data entry field is required, optional, or not allowed (that is, must be blank). This is specified in the Value Status parameter. Descriptions of each specification follow.

SELECTION OPERATOR

The Selection Operator is required if Value Status is R. You can use the following conditional test operators:

- LT (less than)
- LE (less than or equal to)
- EQ (equal to)
- GE (greater than or equal to)
- GT (greater than)
- NE (not equal to)

For character data elements, the operator can be followed by a colon (:) to specify that the comparison is to be limited to leading characters. For example, EQ: will select any observation for which the data element value begins with the character string specified in the corresponding default value field.

DEFAULT VALUE

Default Value is an optional entry. This is the default value that will be displayed on the Execution-Time Parameter Specification panel. A default value is useful if it meets selection requirements for most executions of the inquiry, thereby saving you from having to enter the value each time. A default is also an excellent way to clarify the data entry instructions.

The value is a literal that is compatible with the data element type (that is, if the element is numeric, then the value must be numeric) and length. MICF will convert values to valid SAS literal constructs after editing. Unlike General Data Selection, the character values do NOT need to be entered with quotes. Date and time literals will be converted to valid SAS literal formats, so they do not need to be entered with quotes and type indicators. For example, 10:00:00 and '10:00:00'T are both valid specifications for ten hours for a time data element. Specifications will be converted to uppercase unless you have specified that all "value" type fields can contain lowercase characters.

SELECTION CONNECTOR

The Selection Connector is a required entry if the Value Status is R for the second specification row. That is, if two execution-time data selection values are required, you must specify a selection connector. The Selection Connector is the conditional test connector. Valid values are AND and OR.

VALUE STATUS

Value Status defines whether the value is Required (R), Optional (O), or Not Allowed (N).

o If R is specified, you must supply a value at execution time unless a default value has been specified.

o Specify O for the first data entry field only if it is valid to execute the inquiry without performing data selection against the selection element (that is, execution-time data selection will be ignored if no value is specified).

o If N is specified, no value is allowed.

ALTERNATIVE OPERATOR

The Alternative Operator is an optional entry. It can have any of the values that the Selection Operator can have. This parameter replaces the selection operator for the first data entry field if the second data entry field is left blank at execution time. For example, you can select data for a specific Zone (for example, Zone 2) or alternatively select data for a range of Zones (for example, Zones 1-4). The range selection (Zones 1-4) is defined by specifying GE for the first selection operator and LE for the second selection operator. However, if you coded only the first value, all zones greater than that value would be selected (for example, ZONE GE 2). This situation is addressed by specifying EQ as the alternative operator. Then, when only one value is specified at execution time, the specific value selection will be generated (for example, Zone 2) in place of the range selection.

2.6.3.2.2 Data Summarization

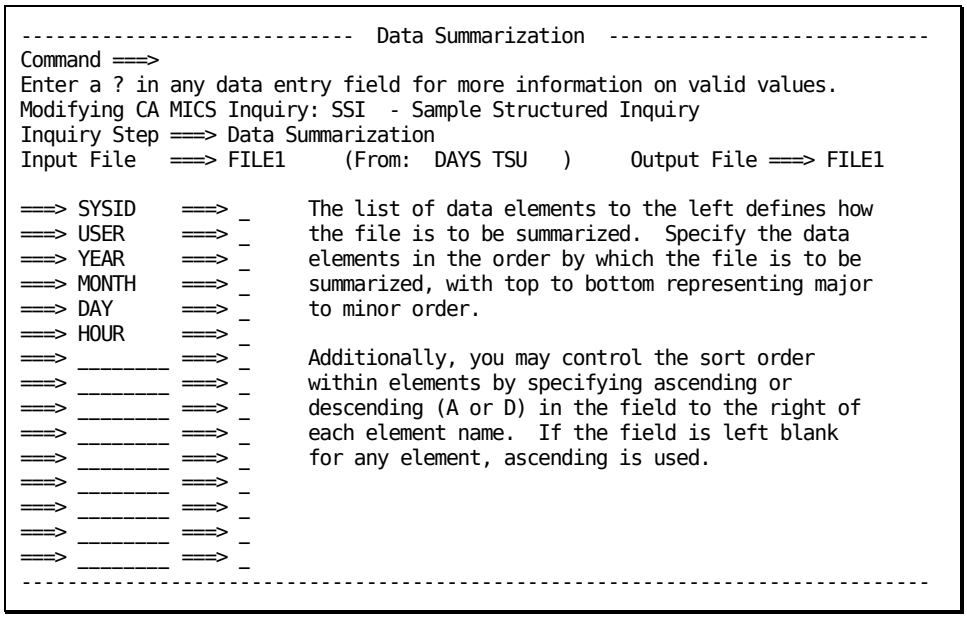


Figure 2-61. Sample of a Completed Data Summarization Panel

The Data Summarization panel (Figure 2-61) provides space to specify 15 data elements as the file sequence keys. The file will be sorted in sequence by the specified keys (from top to bottom), and then summarized to the granularity of the last data element in the list. That is, the topmost element in the list is the most significant key in the sort order and the lowest element on the list is the least significant key.

You can display the Data Summarization panel by specifying option 2, Data Summarization, on the Data Manipulation menu.

Two data entry fields are provided for each sequence key:

- Specify the eight-character data element name in the first field. This must be the name of a data element in the input file.

- Specify a question mark (?) for a list of valid data elements.

The second data entry field is used to specify the sort sequence for that data element. Specify D to request that the file be sorted in descending order by this data element. Leave the second field blank or specify A (the default) to request ascending order for this data element.

The panel comes with the sequence of the input file. The most common scenario is to drop data elements from the end of the list to reduce the granularity of the input file for reporting purposes. You can drop elements from the top or middle of the list by simply blanking them out. Blank entries at the top or middle of the list are NOT a problem.

Figure 2-61 is an example of a completed Data Summarization panel.

2.6.3.2.3 Deriving New Data Elements

```
-------------------------  Data Element Derivation  -------------------------

Command ===>

Composing CA MICS Inquiry: BTCHWT - Batch Job Wait Time Analysis
Inquiry Step ===> Data Element Derivation - Compute Avg. Wait Time/Job
Input File   ===> FILE2     (From:  DETAIL PGM )     Output File ===> FILE2

Element Name  ===> JOBAVWTM
       Label  ===> Avg. Wait Time/Batch Job
Element Type  ===> T
  A - Alphabetic, N - Numeric, T  - Time (quantity), DT - Date-Time,
  H - Hex,        D - Date,    TD - Time-of-day,     M  - Money
Value Length  ===> 11
Output Format ===> TIME11.2
Element Derivation:
  ===> JOBAVWTM = (JOBEXCTM - JOBACTTM) / JOBCOUNT;
                  ____________________________________________________________
                  ____________________________________________________________
                  ____________________________________________________________
                  ____________________________________________________________
                  ____________________________________________________________
                  ____________________________________________________________
                  ____________________________________________________________

------------------------------------------------------------------------------
```

Figure 2-62. Sample of a Completed Data Element Derivation Panel

Use Data Element Derivation to add new data elements to an intermediate file of your structured inquiry. This feature is useful when you need to report a value that is not stored on the CA MICS database.

The Data Element Derivation panel allows you to derive a new data element value from other input file data elements in the file. You have the ability to define the new element's name, label (long name), type (for example, alphabetic, numeric, or date), length, and output format. You can display the Data Element Derivation panel by selecting option 4, Data Element Derivation, from the Data Manipulation menu (Figure 2-55).

Figure 2-62 is an example of a completed Data Element Derivation panel.

2.6.3.2.4 Advanced Data Manipulation

The Advanced Data Manipulation process of Structured Inquiry composition provides access to inquiry functions for:

- Defining intermediate file contents
- Coding free-form SAS statements
- Combining multiple input files to meet reporting requirements
- Inputting saved files from previously executed MICF inquiries

You can display the Advanced Data Manipulation menu by selecting option 5, Advanced Data Manipulation, from the Data Manipulation menu (Figure 2-55).

The following operations are available on the Advanced Data Manipulation menu:

- File Contents Specification lets you keep or drop data elements and/or modify labels and formats.
- SAS System Statements let you manipulate the input file with SAS statements.
- File Concatenation/Interleaving let you combine parallel files to create a new file.
- Relational Retrieval/File Merge lets you combine unlike files to create a new, composite file.
- Data Sequencing lets you sort the input file into a new sequence.
- Independent Source Statements lets you insert SAS statements into the inquiry without a MICF DATA step.
- Execution-Time Parameter Definition lets you define an execution-time parameter that generates a SAS global variable. The prompt you specify is displayed when the inquiry is executed. The parameter value entered at execution-time is saved in a SAS global variable that you can use for data selection, derivation, and/or reporting.

- Data Transfer Facility lets you convert a SAS file into a self-defining, transportable file that can be used to transfer CA MICS data between applications. Data Transfer Facility output is in comma-separated value (CSV) file format.

  In addition to the CSV file, an optional Profile can be created for use in the CA Service Assure product. This profile contains descriptive information regarding the labels, element types and lengths of the data elements contained in the CSV. The profile format is based on the requirements of the Service Assure product and therefore is undocumented and subject to change.

Details on the use of these operations are provided in the online tutorials.

2.6.3.2.5 Saved Files Facilities

Intermediate files that are created by a MICF inquiry are normally deleted when the inquiry completes execution. The Saved Files Facilities let you display the intermediate files. In addition, this facility provides you with the capability to save intermediate files created by an inquiry, and then to use them as input to later MICF inquiries.

The CA MICS Capacity Planner management application provides facilities for generating user-defined files of historical CA MICS data, user data, and forecasts for capacity planning. The Saved File Facilities menu provides access to capacity planning database files so that you can use MICF's color graphics and reporting options to supplement the standard Capacity Planning Product reports and graphics.

You can display the Saved Files Facilities panel by selecting option 7, Saved Files Facilities, from the Data Manipulation menu (Figure 2-55). Details on the use of the Saved File facility are provided in the online tutorial for the facility.

2.6.3.2.6 External File Facilities

You can use the MICF External File Facilities to extend standard MICF inquiry capabilities. You can allocate an external (non-CA MICS) program library and invoke a user-written program for special processing or reporting. You can allocate temporary data sets or gain access to standard CA MICS libraries not normally allocated for MICF inquiry execution.

You can display the External File Facilities panel by selecting option 8, External File Facilities, from the Data Manipulation menu (Figure 2-55). Details on the use of the External File facility are provided in the online tutorial for the facility.

2.6.3.3 Selecting the Reports to Produce

Options 3 through 6 on the Structured Inquiry Selection panel are color graphics, printed reports, printer graphics, and statistical analysis. The types of reports in each of these categories are discussed in detail in section 2.6.1.1. To choose a report on one of these types, enter the corresponding number in the command area.

You will then see a menu with the list of reports of the type you chose. Select one of these and you will be on the correct report definition panel.

As with direct inquiries. an alternate way in which to select a report and display the corresponding report definition panel is to select the last option on the Structured Inquiry Selection panel, Inquiry Function Catalog Display.

Once you have reached a report definition panel, you have the opportunity to specify the inquiry step name, the input file, and the report title, although MICF selects defaults for you for each of these variables.

Data element selection is the same for structured inquiry report definition panels as it is for direct inquiry report definition. Extended options are also available for report customization and can be used the same way that they are for direct inquiries.

2.7 Creating User Reporting Jobstreams

The MICF User Reporting Administration option (MWF;2;5) allows you to define and maintain your own individual inquiry job streams.

- You can add, modify, execute, and your own MICF user reporting job streams.
- You can generate and catalog color graphics, printed reports, and CSV output, either on an adhoc basis or through your data center's own scheduling facilities.
- You can optionally generate hardcopy printed reports, color graphics, and MICSLOG and SAS log while still saving reports, graphics, CSV output, and logs for later online review. You can even use your data center's report management facility (for example, CA Bundl) to route, archive, and manage MICF user reporting hardcopy output.
- You can specify execution-time parameter overrides for execution of MICF inquiries or execute inquiries with predefined default parameter values.
- You can access the Reports and Graphics option (MWF;2;1) for online review and printing of your own user reporting output as well as any shared output accessible to you. color graphics and printed reports, as well as any CSV file output.
- You can automatically generate MICF inquiries from previously saved Q&R developed queries or independent SAS code, and add them to the user reporting job stream.

You will also use MICF User Reporting Administration to define and maintain your own reporting job streams to create your CSV files. You can add CSV file capability to any standard MICF user reporting job stream. The CA MICS Workstation Query and Reporting Guide documents use of MICF User Reporting Administration facilities for CSV file creation.

Each user reporting job stream allocates unique, user-defined printed report and color graphics catalog data sets.

Each user reporting job stream defines a list of MICF inquiries to be executed. You can execute with the predefined default execution-time parameter values specified in the inquiry, or you can specify execution-time parameter overrides for execution. You can create multiple versions of a report with a single user reporting job stream by executing an inquiry multiple times and specifying different execution-time parameter overrides for each execution.

The User Reporting Administration panel (Figure 2-63) displays your MICF user reporting job streams. The display lists job stream name and title. The DB ID is the CA MICS default unit ID for MICF inquiry execution.

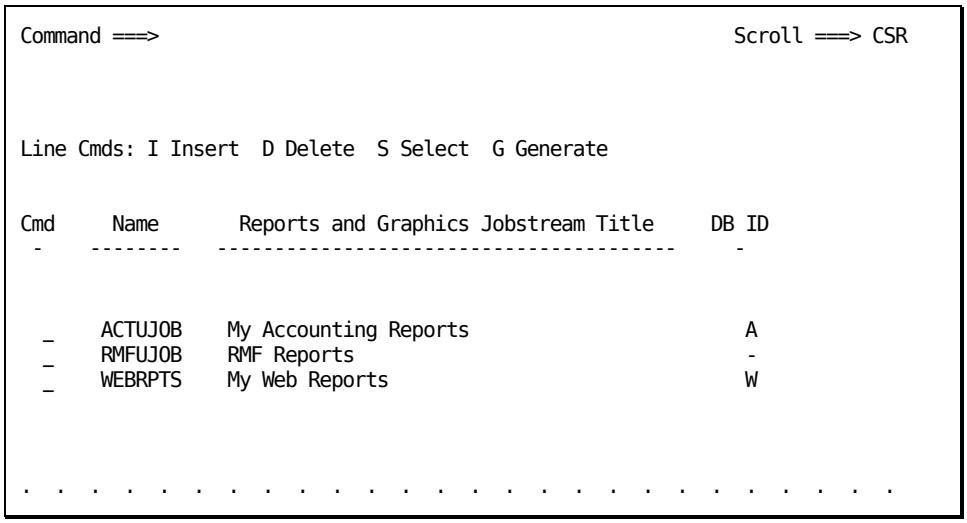


Figure 2-63. User Reporting Administration

Line commands available on the User Reporting Administration panel, Figure 2-63, include:

- I (Insert) defines a new user reporting job stream.
- D (Delete) deletes individual reports and graphics output from the user reporting output catalog, or delete an entire user reporting job stream and ALL saved reports and graphics output.

o S (Select) reviews and modifies an existing job stream.

o G (Generate) is on demand job stream execution, or generates and saves execution JCL for submission through your data center's batch job scheduling facilities.

MICF User Reporting Administration is discussed in the following sections:

1 - Defining a User Reporting job stream
2 - Selecting MICF Inquiries to execute
3 - MICF Automatic Inquiry Generation Interface
4 - Executing a User Reporting job stream
5 - Deleting Reports and Graphics Output
6 - MICF Web Publishing

In addition, the remainder of this section is a step-by-step checklist for implementing MICF user reporting. The checklist refers to specific actions described in sections 2.7.1 through 2.7.6, and therefore you may want to review these sections before trying to use the checklist.

Implementing MICF User Reporting

__ 1. Consider the following issues (you will apply your answers later in the checklist).

o What color graphics devices are used for online graphics review?
What color graphics devices are used for hardcopy graphics output?
Do you use black and white or grey scale graphics, for example on a laser printer?

o Which MICF inquiries do you want to regularly execute so that reports are generated and saved? What execution-time parameter overrides are needed to generate the reports?

o How are you going to execute your user reporting job stream? Do you have a production batch job scheduling facility/procedure that you can use, or are you going to submit the job manually on a regular basis?

- When do you want the reports to execute -- daily, weekly, monthly?

- What dependencies do the reports have?
  Do they depend on a single database unit update?
  or
  Do the reports extract information from multiple CA MICS database units?

__ 2. Use the MICF User Reporting Administration option to define a MICF user reporting job stream that will generate and save the reports.
Reference: Section 2.7.1

__ a. Select option 5, User Reporting Administration, from the MICF Primary Options menu.

__ b. Use the insert (I) line command to insert a new MICF user reporting job stream.

__ c. Specify the job stream name, title, and catalog table data set name on the Insert Reporting Jobstream panel.

The output catalog definition is saved to your private user tables library, therefore only you will be able to access it from MICF Reports and Graphics Output (MWF;2;1).

- The job that executes the user reporting job stream must have authority to UPDATE the catalog table data set AND must be able to CREATE (that is, allocate new), UPDATE, and DELETE the associated color graphics, printed report output, and CSV output data sets.

- For CA MICS job streams that generate CSV files, the job that executes the reporting job stream may also need to have authority to UPDATE the sharedprefix.MICS.DTF.INDEX data set, depending on the options set by your MICS Administrator. Reference: PIOM 4.4.2.2

__ d. Press END to allocate the catalog table data set, insert the user reporting job stream definition, and display the User Reporting Jobstream panel.

- Specify a maximum report retention limit.
  - Specify a nonzero value to retain reports, graphics, and logs for later online review.
  - If you plan to generate hardcopy reports and color graphics, you have the option to specify 0.
  - Even if you want hardcopy output, MICF's online retention of reports and graphics provides a valuable reporting "archive" so reports and graphics are available online long after hardcopy output have been discarded.

- Specify default DB ID. If the inquiries access multiple CA MICS databases, leave blank.

- Specify default file cycles parameters.

- Review the generated printed reports, color graphics, temporary report, and temporary MICSLOG data set names and make any changes you require. Remember that the data set names MUST be unique.

__ e. Select MICF Inquiries for Reporting Jobstream you want to execute in this MICF user reporting job stream.

Enter a Y in the "Specify Inquiries for Reporting Jobstream" field and press ENTER. A subordinate menu is displayed. Select Option 2 to select MICF inquiries from both the shared catalog or your own private MICF inquiry catalog.
Reference: Section 2.7.2

- You can toggle the catalog from shared to private to select inquiries from either catalog.

- You can change the catalog group specification when you select an inquiry. Inquiry output is organized in the user reporting catalog according to the catalog group assignments you make when you select inquiries for the reporting job stream.

- You can specify execution-time parameter overrides. For example, you can define execution-time parameter overrides to specify the P (primary) unit for one inquiry and the I (IMS) unit for another inquiry. You can also execute a single inquiry multiple times. For example, run the IMSCD2 inquiry once for all production IMS regions and a second time for development (or test) regions.

After you have selected all the MICF inquiries, press END to save your selections and return to the Inquiry Selection Options menu.

__ f. Choose Option 3 from the Inquiry Selection Options menu if you want to generate MICF inquiries from Q&R developed queries or independent SAS code, and add them to the user reporting job stream.
Reference: Section 2.7.3

- You can change the catalog group specification when you select an inquiry. Inquiry output is organized in the user reporting catalog according to the catalog group assignments you make when you select inquiries for the reporting job stream.

__ g. Select Data Set Allocation Parameters (enter a Y following the prompt and press ENTER) if you want to change defaults for allocating the user reporting output data sets.
Reference: Section 2.7.1.2

__ h. Select Execution and Hardcopy Output Options (enter a Y following the prompt and press ENTER) if you want to change default color graphics device parameters or other execution options, generate hardcopy printed reports, generate hardcopy color graphics, or activate the hardcopy error log.
Reference: Section 2.7.1.3

__ i. Press END on the User Reporting Jobstream panel after you complete the definition.

__ 3. We suggest that you test the job stream using the G (generate) line command on the User Reporting Administration panel to generate and submit a batch job to execute your job stream definition. Examine the MICSLOG output for any error conditions and correct any problems before proceeding with this checklist.
Reference: Section 2.7.4

__ a. If you run the suggested test, then use the MICF Reports and Graphics option to review the reports online. Note and correct any problems in catalog groups, color graphics device parameters, execution-time parameter overrides, and SAS execution parameters. Make sure that ALL inquiries execute successfully and generate the desired output.

__ b. If you are generating hardcopy reports and logs, verify that the output is written to the proper SYSOUT class and form. Correct any problems in hardcopy report and log SYSOUT allocation parameters. Make sure your report management facility (for example, CA Bundl) will be able to capture the hardcopy output.

__ c. If you are generating hardcopy graphics, verify that the output is generated on the proper graphics device. Correct any problems in hardcopy color graphics device parameters. Verify that online and hardcopy color graphics device specifications are compatible and that MICF graphics are usable both online and in hardcopy format. This is especially important when routing hardcopy graphics to a laser printer. Ensure that the MICF execution parameters select a color graphics format set using hashed patterns so that the graphics are usable both in color (online) and in black and white (hardcopy).

2.7.1 Defining a User Reporting Jobstream

```
------------------------  Insert Reporting Jobstream  -----------------------
```

```
Command ===>
```

```
Jobstream Name ===> RMFUJOB
               Title ===> RMF Reports

Catalog Table Data Set ===> 'userid.RMFUJOB.CATALOG'
```

```
Space units         ===> TRK          (BLK, TRK, or CYL)
   Primary quantity    ===> 2            (In above units)
   Secondary quantity  ===> 1            (In above units)
   Directory blocks    ===> 1            (For partitioned data sets)
   Round block alloc.  ===> NO           (YES/NO)
   Block size          ===> 9040         (Maximum block size)
   Record length          : 80
   Data set org.          : PO
   Record format          : FB
   Generic unit        ===> 3390         (Generic group name or unit address)
   Volume serial       ===> ______       (Blank for default volume)
   Expiration date     ===> ________     (yyddd or yyyy/ddd)
   Retention period    ===> ______       (Number of days)
   Additional allocation parameters:
      DCB     ===> ____________________________________________________________
      Other   ===> STORCLAS=MICSDASD_____________________________________________
```

```
. . . . . .
```

Figure 2-64. Sample Insert User Reporting Jobstream Panel

The Insert Reporting Jobstream panel (Figure 2-64) is displayed when you enter the Insert (I) line command on the User Reporting Administration panel. Enter job stream name, title, and catalog data set allocation parameters and then press END to initialize the new user reporting job stream definition.

- Jobstream Name is required. This 1-8 character "short name" or key is used to save and reference the new user reporting job stream. Jobstream Name must be unique and cannot be SHARED, PRIVATE, or BSTAGE.

- Title is required. The 1-40 character title is displayed on the User Reporting Administration and on the Reports and Graphics panels.

- Catalog Table Data Set is required. Enter a fully qualified data set name (DSN) in quotes. Do not enter a member name. If you do not enclose the DSN in quotes, your TSO user PREFIX and the quotes will be added.

  Choose the catalog table DSN carefully. You CANNOT change the DSN after you leave this panel. The user reporting definition and the output catalog are stored in this data set. You will reference and update this data set through batch job JCL statements to execute the user reports.

```
---------------------- Reports and Graphics Jobstream -----------------------
Command ===>

Jobstream Name ===> RMFUJOB
Title ===> RMF Reports
Maximum Report Retention ===> 15 (0-999 reporting cycles)
Database ID ===>              P (PRIMARY)
Default File Cycle(s) ===>    01 - 00 (00-99)

Catalog Table Data Set ===> 'userid.RMFUJOB.CATALOG'
Permanent Data Sets (allocated for each jobstream execution)
Printed Reports DSN ===> 'userid.RMFUJOB.MWFPDS**.DATA'
Color Graphics DSN ===> 'userid.RMFUJOB.MWFSAS**.DATA'

Temporary Work Data Sets (deleted after jobstream execution)
          Report DSN   ===> 'userid.RMFUJOB.REPORT'
          MICSLOG DSN  ===> 'userid.RMFUJOB.LOG'
Specify MICF Inquiries for Reporting Jobstream ===> N (Y/N)  *** Specified ***
Override Data Set Allocation Parameters        ===> N (Y/N)
Specify Execution and Hardcopy Output Options  ===> N (Y/N)
. . . . . .
```

Figure 2-65. Sample User Reporting Jobstream Panel

- The remainder of the panel provides data set allocation specifications for the catalog table data set. Default values are taken from the PCATALOG entry in MICF Options, Data Set Allocation Parameters. The catalog table data set contains two ISPF tables. DASD space requirements will vary depending upon the number of inquiries in the user reporting job stream and the number of output cycles (or job stream executions) you retain.

When you press END (or enter the END primary command) on the Insert Reporting Jobstream panel, MICF saves your specifications, allocates the catalog table data set, initializes the job stream definition and user reporting catalog tables, and then displays the User Reporting Jobstream panel (Figure 2-65) so you can complete the user reporting job stream definition.

The User Reporting Administration panel (Figure 2-65) is displayed when you enter the Select (S) line command on the User Reporting Administration panel (Figure 2-63) or when you enter END on the Insert Reporting Jobstream panel (Figure 5-5). Use this panel to complete and/or update the user reporting definition.

You can change the job stream name and title on this panel. Other parameters are discussed below.

- Maximum Report Retention is required and defaults to 12.

  - This parameter defines the number of output cycles (or job stream executions) retained in the user reporting catalog. The user reporting job stream execution process deletes reporting cycles (beginning with the oldest) when the number of catalog cycles exceeds this value.

  - Note: The printed report and color graphics DSNs must contain one asterisk (*) for each digit in the parameter.

  - If you are generating hardcopy reports and/or color graphics AND if you are not creating CSV files, then you can specify 0 for maximum report retention. After execution completes, MICF will delete the printed report and color graphics data sets used to hold printed reports, color graphics, MICSLOG, and SAS log during execution processing.

- Database (DB) ID is optional and provides the default DB ID for MICF inquiry execution. If your inquiries allow execution-time DB ID override and do NOT specify a default value, then you can provide the default here. Remember that inquiry level execution-time parameter overrides will override this default.

- Default File Cycle(s) is optional and provides the default CA MICS file cycle (specify first field) or cycle range (specify both fields) for inquiry execution. If your inquiries allow execution-time cycle override and do NOT specify a default value, then you can provide the default here. Remember that inquiry level execution-time parameter overrides will override this default.

You can specify DB ID and File Cycle(s) uniquely for each inquiry through the execution-time parameter override facility. Select the "Specify MICF Inquiries for Reporting Jobstream" extended option to override execution-time parameters.

Two permanent data sets are allocated for each user reporting job stream execution. Data entry fields are provided for Printed Reports DSN and Color Graphics DSN. Both are required. Specify fully qualified data set names (DSN) in quotes. Do not enter a member name. If you do not enclose a DSN in quotes, your TSO user PREFIX and the quotes will be added.

- Data entry fields are initialized from Catalog Table DSN, replacing the last DSN qualifier with MWFPDS**.DATA for Printed Reports DSN and MWFSAS**.DATA for Color Graphics DSN. If Catalog Table DSN has only one DSN index, then MWFPDS**.DATA and MWFSAS**.DATA are appended to the end of Catalog Table DSN. The *s (asterisks) in the DSNs indicate where the generation (or logical cycle) number will appear. You must include one asterisk (*) for each digit in the Maximum Report Retention value.

- If an execution of the user reporting job stream does NOT generate any color graphics, then MICF will delete the color graphics data set after execution completes.

- Printed Reports DSN and Color Graphics DSN apply only to new data set allocations (that is, new job stream executions). You can change DSNs without impacting reports and graphics saved by previous executions (that is, you do not lose existing cycles when you change DSN).

o If you specify 0 for Maximum Report Retention, then the printed reports and color graphics data sets are used as staging data sets to hold printed reports, color graphics, MICSLOG, and SAS log during execution processing. MICF will delete the printed reports and color graphics data sets after execution completes.

Two inquiry output staging data sets are allocated for reporting job stream execution and are deleted when processing terminates normally. Data entry fields are provided for Report DSN and MICSLOG DSN. Both are required. Specify fully qualified data set names (DSN) in quotes. Do not enter a member name. If you do not enclose a DSN in quotes, your TSO user PREFIX and the quotes will be added. Data entry fields are initialized from Catalog Table DSN, replacing the last DSN index with REPORT for Report DSN and MICSLOG for MICSLOG DSN. If Catalog Table DSN has only one DSN index, then REPORT and MICSLOG are appended to the end of Catalog Table DSN.

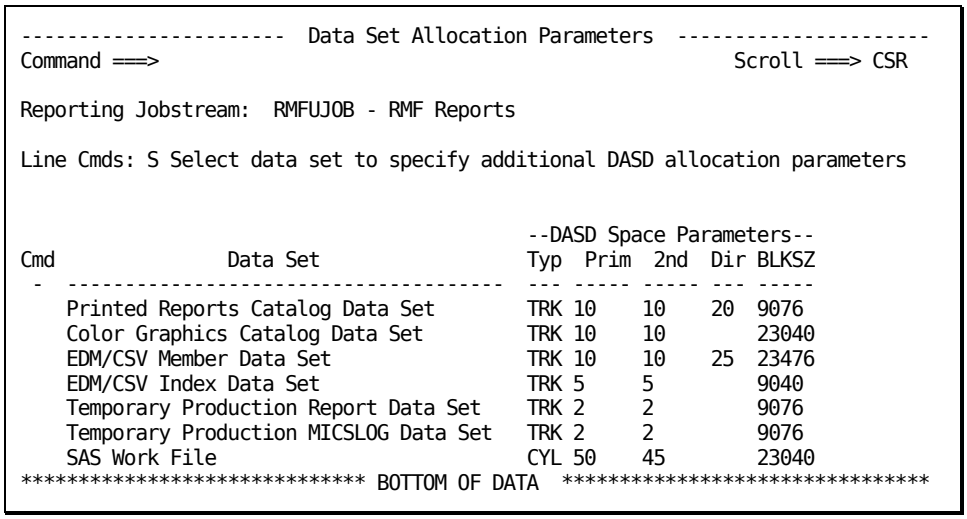
Use the remaining data entry fields to access subordinate options. The MICF Inquiries for Reporting Jobstream option is required. All others are optional. Specify Y (Yes) in the data entry field following an option to invoke that option panel. Once you specify an option, a flag will appear on the right side of the panel. If you select multiple options (that is, you enter a Y on more than one line), the options are processed sequentially.

The data set allocation parameters and execution options are discussed in the following sections.

1 - Data Set Allocation Parameters
2 - Execution and Hardcopy Output Options

MICF inquiries are discussed in sections 2.7.2 and 2.7.3.

2.7.1.1 Data Set Allocation Parameters



```
----------------------  Data Set Allocation Parameters  ----------------------
Command ===>                                                 Scroll ===> CSR

Reporting Jobstream:  RMFUJOB - RMF Reports

Line Cmds: S Select data set to specify additional DASD allocation parameters


                                                --DASD Space Parameters--
Cmd              Data Set                       Typ  Prim  2nd  Dir BLKSZ
 -  ------------------------------------------  --- ----- ----- --- -----
    Printed Reports Catalog Data Set            TRK 10    10    20  9076
    Color Graphics Catalog Data Set             TRK 10    10        23040
    EDM/CSV Member Data Set                     TRK 10    10    25  23476
    EDM/CSV Index Data Set                      TRK 5     5         9040
    Temporary Production Report Data Set        TRK 2     2         9076
    Temporary Production MICSLOG Data Set       TRK 2     2         9076
    SAS Work File                               CYL 50    45        23040
****************************** BOTTOM OF DATA  *******************************
```

Figure 2-66. Sample Data Set Allocation Parameters

Use this option (see Figure 2-66) to override default DASD data set allocation specifications for the printed report, color graphics, temporary report staging, and temporary MICSLOG data sets. Initial default values are copied from the Data Set Allocation Parameters process of MICF Options. You can override DASD space parameters, logical unit, expiration date, block size, etc.

You can override data set allocation parameters for the four user reporting job stream data sets described below:

- Printed Reports Catalog Data Set

  User reporting printed reports, MICSLOG, and SAS logs are saved in the printed reports catalog data set. The printed reports catalog data set is an OS partitioned data set (PDS; DSORG=PO) containing variable length records with printer carriage control characters (RECFM=FBA) and a maximum length of 260 characters (LRECL=260). Each user reporting inquiry adds three members to the printed reports catalog data set for the printed reports, MICSLOG, and SAS log.

DASD space requirements will vary depending upon the number of inquiries, the size of printed reports (number and length of lines), and the length of the MICSLOG and the SAS log. You will need space for the MICSLOG and the SAS log even if the user reporting job stream does not include printed reports (for example, CSV output creation only). You will also need one directory block for each six inquiries in the user reporting job stream.

- Color Graphics Catalog Data Set

  User reporting color graphics output is saved in the color graphics catalog data set. The color graphics catalog data set is a SAS data set (DSORG=PS,RECFM=FS) containing one SAS/GRAPH GREPLAY catalog for each color graphics inquiry in the user reporting job stream.

  DASD space requirements will vary depending upon the number of inquiries, the number of graphs in each inquiry, and the complexity of color graphics output. The color graphics catalog data set is always allocated, even if the user reporting job stream does not include color graphics. If you are not using color graphics, then specify a single DASD track for data set allocation. You can increase the space allocation if you add color graphics later.

- EDM/CSV Member Data Set

  CSV outputs are stored in the production inquiry output catalog CSV data set. The CSV catalog data set is a partitioned data set (DSORG=PO,RECFM=FB) containing one or more members for each inquiry in the production reporting jobstream that produced CSV output.

  DASD space requirements will vary depending upon the number of inquiries, and the number and size of the CSVs. The CSV catalog data set is always allocated, even if the production reporting jobstream does not include CSV output. If you are not generating CSV output, specify a single DASD track for data set allocation. You can increase the space allocation if you generate CSV output later.

- EDM/CSV Index Data Set

  A sequential data set used as a directory of all Comma Separated Value (CSV) extract files available to other applications.

- Temporary Report Staging Data Set

  Printed reports are stored in the temporary report staging data set during inquiry execution. The printed report staging data set must be large enough to hold the largest printed report in the user reporting job stream. The printed report staging data set is always allocated, even if the user reporting job stream does not include printed reports. If you are not using printed reports, then specify a single DASD track for data set allocation. You can increase the space allocation if you add printed reports later.

- Temporary MICSLOG Data Set

  The MICSLOG is stored in the temporary MICSLOG data set during inquiry processing. You should allocate sufficient space for up to 500 records (about 50 KB).

- SAS Work File

  Defines the storage space where all the one-level name files are stored by SAS during execution.

2.7.1.2 Execution and Hardcopy Output Options

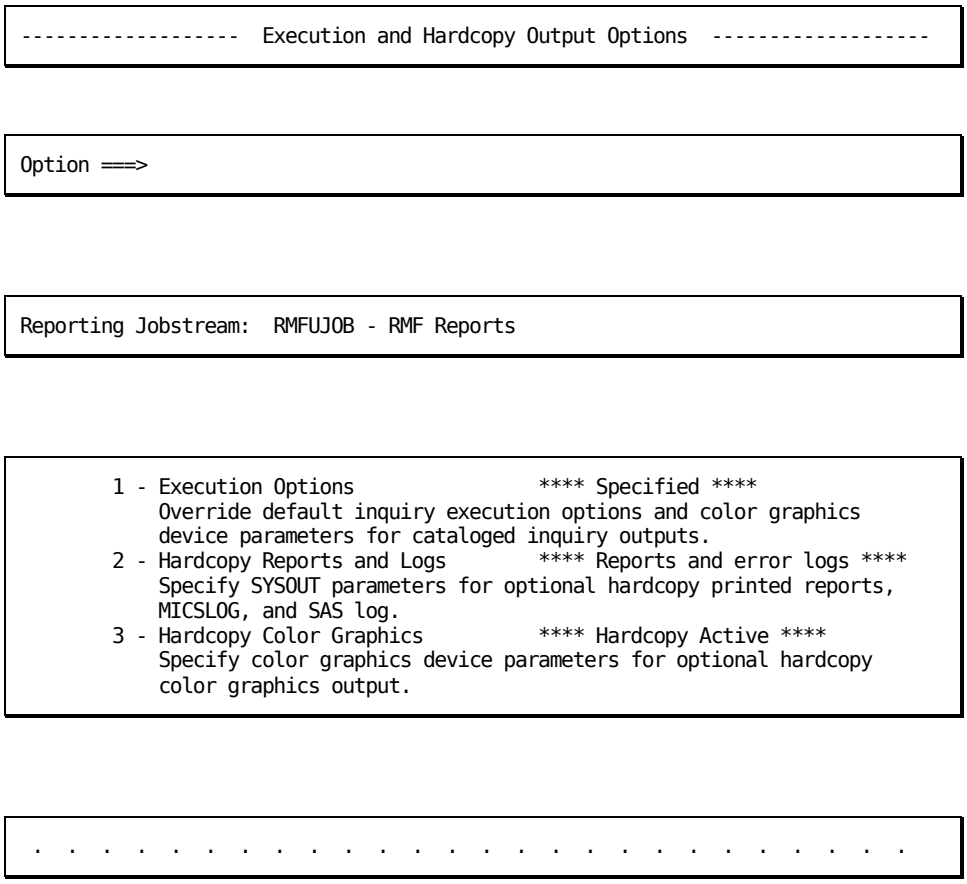


Figure 2-67. Execution and Hardcopy Output Options

Execution and Hardcopy Output Options give you access to three facilities for customizing MICF user reporting. You can override default SAS/CA MICS execution options, including default color graphics device parameters. You can optionally generate hardcopy reports, MICSLOG, and SAS logs, and color graphics while still saving inquiry output for later online review. You can also use this option to generate a hardcopy log of inquiry execution errors.

The Execution and Hardcopy Output Options menu displays a textual status flag to the right of each menu option to indicate the option's current status. A blank means the option is NOT active and default parameters are still in effect.

The options provided on the Execution and Hardcopy Output Options menu are described in the following sections and are summarized below.

1 - Execution Options

Use this option to override default execution options. MICF user reporting job stream execution options default to the values you specify in Shared MICF Options, Foreground Execution Parameters.

You may prefer to specify this extended option to "lock" your user job execution options, thereby avoiding the risk of shared options changes impacting your user reporting. You can specify default color graphics format set for color graphics inquiry steps that do not override color graphics format parameters. You can also specify color graphics device parameters and SAS execution parameters.

2 - Hardcopy Reports and Logs

Use this option to generate hardcopy reports and MICSLOG and SAS log in addition to saving inquiry output for later online review. You can direct MICF reports and logs to SYSOUT for capture by your data center's report management facility (for example, CA Bundl).

You can instruct MICF to copy ALL printed reports to JES SYSOUT. ALL printed reports are still available for online review through the MICF Reports and Graphics option.

You can instruct MICF to copy just the MICSLOG output from ALL inquiries, just the SAS log output from ALL inquiries, or both the MICSLOG and SAS log for all inquiries to the JES SYSOUT you define. ALL MICSLOG and SAS log listings are still available for online review through MICF Reports and Graphics.

Or you can generate a hardcopy error log. When an inquiry execution error occurs, MICF will copy the failing inquiry's MICSLOG and SAS log to JES SYSOUT. The hardcopy error log will be empty when all inquiries execute successfully.

3 - Hardcopy Color Graphics

Use this option to request hardcopy color graphics output in addition to saving inquiry output for later online review.

This option lets you execute and save MICF inquiry color graphics using color graphics device parameters that are best for online color graphics review. Then you define a unique, hardcopy color graphics device to which MICF will copy ALL color graphics output.

2.7.1.2.1 Execution Options

```
----------------------------  Execution Options  ----------------------------
Command ===>

Reporting Jobstream:  RMFUJOB - RMF Reports
Enter RESTORE command to erase parameter overrides and use the defaults.
--------------------------------------------------------------------------------
                                                                        More:     +
******************************** Top of data ********************************
Color Graphics Options
----------------------
   Generate Graphics for     ===> Y (Y/N)
   MICF Web Publishing:
   Color Graphics Format Set ===> TERMINAL
   Color Graphics Device     ===> IBM3279
   Override Device Parms.    ===> N (Y/N)

SAS Execution Options
---------------------
   Allocate prefix.PARMS to  ===> ________
   No. Sort Work Data Sets   ===> 0 (0-6)
   List the SAS Source Code  ===> Y (Y/N)
   List Expanded Macros      ===> Y (Y/N)
   Print Notes in Listing    ===> Y (Y/N)
   Overprint Errors          ===> N (Y/N)
   Abend for Errors          ===> N (Y/N)
   Translate Output to CAPS  ===> N (Y/N)
   Max. No. Error Msgs.      ===> ___
   Max. No. Observations     ===> _______

   Page Dimensions:  Columns ===> 132      (64 - 256)
                     Lines   ===> 60       (20 - 500)

   Additional SAS Options    ===>

MICF Web Publishing Options
---------------------------
   Activate                  ===> Y (Y/N)
   MWP Root Directory
    ===> /u/ca_mics/website
   Create Web Index          ===> Y (Y/N)
   Web Index Page Name       ===> view
   Aging                     ===> Y (Y/N) Cycles ===> 7
   Produce Reports           ===> N (Y/N)
   Page Options              ===> NONE     (ALL/NONE/OUTPUT/PAGE/PROC)
   Output Template           ===> STYLES.DEFAULT
   Index Template            ===> STYLES.DEFAULT
   Translation Table         ===> EBCDIC   (EBCDIC/ASCII)
   Output CSV to MWP Dir     ===> N (Y/N)

Q&R Workstation Integration
---------------------------
   Q&R Mainframe Svr(MQRMSN)   ===> MQRSYS1
   Use Q&R Compatible
   Directory Structure         ===> N
     Q&R Root Directory
       ===> /u/users/nfs/camics
   Initiate RMWSLOAD           ===>
      RMWSLOAD Job Name        ===> RMFUJOB

****************************** Bottom of data ******************************
```

Figure 2-68. Execution Options

```
MICF user reporting job stream execution options default to
 the values that you specify in Shared MICF Options,
 Foreground Execution Parameters.

 You may prefer to specify this extended option to "lock" your
 user reporting job execution options, avoiding the risk of
 shared options changes impacting your reporting.  You can
 specify:

 o  The default color graphics format set for color graphics
    inquiry steps that do not override color graphics format
    parameters.

 o  Color graphics device parameters.

 o  Report page size.  Page size typically defaults to 80
    columns by 23 lines for easy online report review.

 o  SAS execution parameters such as SAS log content, whether
    to abend when errors are detected, the number of sort work
    data sets to allocate, and other SAS execution parameters.

 o  MICF Web Publishing options, such as the style template
    and aging, pagination, and character translation options.

 o  Q&R Integration options that control writing the MICF
    inquiry output to the HFS/zFS directory for use by the Q&R
    Workstation, which lets you publish the report and the chart
    output to your corporate intranet.

 o  Whether you choose to use the Q&R directory structure or
    continue to have RMWSLOAD read the corresponding DTF
    index, you can have your reporting job stream
    automatically notify the Q&R mainframe server that the job
    stream has completed.  The mainframe server notifies the
    distributed server to begin executing the RMWSLOAD job
    that corresponds to the name defined in the Execution
    Options panel for this job stream.

 There are two execution options data entry panels.  The
 Execution Options panel is displayed first.  Use this panel
 to specify color graphics device, color graphics format set,
 SAS execution options, and MICF Web Publishing options.
 Note: This is a scrollable panel, and not all options
 can appear at once. Use the scroll keys to view all options.

 Enter a Y following the Override Device Parms prompt to
 display the Color Graphics Device Parameters panel.
```

MICF color graphics output is saved in a device-independent format, so that your replay options are not limited to the color graphics device that you specify here. You can obtain the best results if you specify the color graphics device that you use most often for online graphics review.

If you plan to generate hardcopy color graphics output, either during the inquiry execution or by "printing" cataloged output, specify the color graphics parameters that are also compatible with your hardcopy graphics device. Specifying these graphics parameters are especially critical if you plan to use either a laser printer or a pen plotter for hardcopy output. In this situation, select a color graphics format set similar to the distributed PENPLOT format set. This setting allows the MICF color graphics to be hashed rather than filled patterns so that the graphics are usable both online and in hardcopy format on either a pen plotter or a black and white laser printer.

You can reset previously specified execution options by entering the RESTORE command on the Execution Options panel. MICF clears your execution option overrides and redisplays the Execution and Hardcopy Output Options menu.

2.7.1.2.2 Hardcopy Reports and Logs

```
------------------------  Hardcopy Reports and Logs  ------------------------

Command ===>

Reporting Jobstream:  RMFUJOB - RMF Reports

-------------------------  Hardcopy Printed Reports  ------------------------

Print Reports ===> YES   (YES/NO)
SYSOUT Class  ===> R                              SYSOUT Form   ===> ____
Destination   ===> N14R45                         SYSOUT Writer ===> ________
SYSOUT Parms. ===> COPIES=3


-------------------------Hardcopy MICSLOGs and SAS Logs-----------------------

Print Logs    ===> ERROR (MICS/SAS/BOTH/ERROR/NO)
SYSOUT Class  ===> A                              SYSOUT Form   ===> ____
Destination   ===> ________________               SYSOUT Writer ===> ________
SYSOUT Parms. ===> ____________________________________________________________


Enter the RESTORE command to erase parameter overrides and use the defaults.

. . . . . .
```

Figure 2-69. Hardcopy Reports and Logs

The Hardcopy Reports and Logs panel lets you generate hardcopy reports and MICSLOG and SAS log in addition to saving inquiry output for later online review. You can write printed reports to a user-defined SYSOUT data set. You can also write MICSLOG and SAS log to a separate SYSOUT data set. You can use the Hardcopy Reports and Logs options to route MICF reports and logs to your data center's report management facility (for example, CA Bundl).

The Hardcopy Reports and Logs panel is in two sections. The upper section applies to printed reports while the lower section applies to the MICSLOG and SAS log. The panel options are described in the paragraphs that follow.

You can instruct MICF to copy ALL printed reports to the JES SYSOUT data set you define in the Hardcopy Printed Reports section of the panel.

- Enter YES (or Y) following the Print Reports prompt to generate hardcopy printed reports.

- You can specify SYSOUT class, destination, form number, and other SYSOUT allocation parameters to direct printed reports to the desired location. ALL printed reports from ALL inquiries in the user reporting job stream will be written to this SYSOUT file. ALL printed reports are still available for online review through the MICF Reports and Graphics option.

- Enter NO (or N) following the Print Reports prompt to just save printed reports for later online review. You can change your hardcopy specification from YES to NO without deleting the SYSOUT allocation parameters. Just enter NO and END from the panel. MICF will turn off hardcopy reports, but still save your SYSOUT allocation parameters for use if you later reactivate hardcopy printed reports.

You can instruct MICF to copy just the MICSLOG output, just the SAS log output, or both MICSLOG and SAS log to the JES SYSOUT data set you define in the Hardcopy MICSLOG and SAS Log section of the panel.

- Enter CA MICS (or M) following the Print Logs prompt to generate hardcopy MICSLOG output. ALL MICSLOG text from ALL inquiries in the user reporting job stream will be written to the SYSOUT data set you define for hardcopy logs. SAS logs will only be retained online.

- Enter SAS (or S) following the Print Logs prompt to generate hardcopy SAS log output. ALL SAS log text from ALL inquiries in the user reporting job stream will be written to the SYSOUT data set you define for hardcopy logs. MICSLOG will only be retained online.

- Enter BOTH (or B) following the Print Logs prompt to write both the MICSLOG and the SAS log for each inquiry to the hardcopy (SYSOUT) file. For each inquiry, the MICSLOG will be written first, followed by the SAS log.

- You also have the option to generate a hardcopy error log. Enter ERROR (or E) following the Print Logs prompt to activate the hardcopy error log. When an inquiry execution error occurs, MICF will copy the failing inquiry's MICSLOG and SAS log to the JES SYSOUT data set you define. The hardcopy error log will be empty when all inquiries execute successfully.

- You can specify SYSOUT class, destination, form number, and other SYSOUT allocation parameters to direct logs to the desired location. MICSLOG and SAS log will be written to SYSOUT. ALL MICSLOG and SAS log listings are still available for online review through the MICF Reports and Graphics option.

- Enter NO (or N) following the Print Logs prompt to only save MICSLOG and SAS log for later online review. You can change your hardcopy specification to NO without deleting the SYSOUT allocation parameters. Just enter NO and END from the panel. MICF will turn off hardcopy logs but still save your SYSOUT allocation parameters for use if you later reactivate hardcopy MICSLOG and SAS log.

The SYSOUT data set allocation parameters on this panel default to values from the User Reporting Hardcopy options in MICF Options, User Profile Parameters. You can tailor the defaults in MICF Options to match the SYSOUT parameters you use most often for user reporting hardcopy output.

You can reset and erase previously specified hardcopy printed report and log options by entering the RESTORE command on the Hardcopy Reports and Logs panel. MICF will clear your hardcopy report and log specifications and redisplay the Execution and Hardcopy Output Options menu.

2.7.1.2.3 Hardcopy Color Graphics

```
------------------------  Hardcopy Color Graphics  -------------------------
```

```
Command ===>
```

```
Reporting Jobstream:  RMFUJOB - RMF Reports
```

```
Hardcopy Graphics     ===> YES      (YES/NO)
Color Graphics Device ===> TCX4510              Background Color ===> ________
Allocate ADMDEFS File ===> NO       (YES/NO)
Graphics Color List (GOPTIONS COLOR= parameter)
===> ____________________________________________________________________________
===> ____________________________________________________________________________
===> ____________________________________________________________________________
Device Parameters (other GOPTIONS parameters)
===> PROMPTCHARS='0000010000400000'X
===> ____________________________________________________________________________
===> ____________________________________________________________________________

GSF Option    ===> GACCESS  (NONE/GSF/GACCESS/ADMGDF/DISPLAY)
    DDNAME    ===> GSASFILE
SYSOUT Class  ===> G                              SYSOUT Form   ===> ____
Destination   ===> REMOTE65                       SYSOUT Writer ===> PLOTWTR
SYSOUT Parms  ===> ____________________________________________________________
or GSF DSNAME ===> _____________________________________  DISP ===> ___
```

```
. . . . . .
```

Figure 2-70. Hardcopy Color Graphics

The Hardcopy Color Graphics panel lets you generate hardcopy color graphics in addition to saving inquiry output for later online review. You can write color graphic output to a unique, hardcopy color graphics device even if you defined an online color graphics device for inquiry execution.

You can instruct MICF to copy ALL color graphic output to the color graphics device you define on this panel. You can execute and save MICF inquiry color graphics using color graphics device parameters that are best for online color graphics review. Then you can define a unique, hardcopy color graphics device to which MICF will copy ALL color graphics output. ALL color graphics are still available for online review through the MICF Reports and Graphics option.

- Enter YES (or Y) following the Hardcopy Graphics prompt to generate hardcopy color graphics. ALL color graphics output from ALL inquiries in the user reporting job stream will be written to the color graphics device you define on this panel.

- Enter NO (or N) following the Hardcopy Graphics prompt to only save color graphics for later online review. You can change your hardcopy specification from YES to NO without deleting the color graphics device parameters. Just enter NO and END from the panel. MICF will turn off hardcopy color graphics but still save your color graphics device parameters for use if you later reactivate hardcopy color graphics.

The remainder of the panel defines the target hardcopy color graphics device. The color graphics device parameters default to the values you specify in MICF Options, Batch Execution Parameters. When you press END, MICF will retain the contents of ALL data entry fields on this panel for use the next time you select this option for the user reporting job stream.

Color Graphics Device Parameters include the following:

- Color list--the SAS/GRAPH GOPTIONS COLORS= parameter.

- Unique SAS/GRAPH GOPTIONS parameters to access the color graphics device.

- Graphics stream file (GSF) allocation specifications (for example, SYSOUT allocation parameters) for color graphics devices using the SAS/GRAPH GSF interface (for example, a pen plotter installed as a JES remote printer), IBM's GDDM ADMIMAGE interface, or other color graphics output stream facility.

2.7.2 MICF Inquiries for Reporting Job Stream

```
---------------------------  Database Inquiries  ----------------------------
```

```
Command ===>                                                  Scroll ===> CSR
```

```
Reporting Jobstream:  RMFUJOB - RMF Reports
```

```
                                                  Catalog Group ===> *
                                                  Inquiry Name  ===> _____

Line Cmds: I Insert  D Delete  S Select  M Move  E Exec-Time  R Reset Parms

Cmd    Name                 Title                        Exec-Time   Catalog
 -   --------  ---------------------------------------  -----------  --------
 _    RMFED1    MVS CPU and ASID Activity (.CSV)         *Specified*  SHARED
 _    RMFED1    MVS CPU and ASID Activity (.CSV)         *Specified*  SHARED
 _    RMFED5    MVS Top-4 CPU Busy Comparison (.CSV)                  SHARED
 _    RMFLPA    Post Processor CPU Activity Report                    SHARED
      CPUBSY    User Reporting CSV Extract                            PRIVATE
****************************** BOTTOM OF DATA  *******************************

Scrolling RIGHT on an inquiry display shows the following:


SCROLL LEFT TO RETURN TO INQUIRY INFO

Line Cmds: I Insert  D Delete  S Select  M Move  E Exec-Time  R Reset Parms


    Inquiry
Cmd   Name    Typ  Prim  2nd  STORCLAS DATACLAS MGMTCLAS
 -  --------  --- ----- ----- -------- -------- --------
     RMFED1   CYL 25    5
     RMFLPA
     RMFCPU   CYL 15    5
     PRTCPU   TRK 10    5
******************************** Bottom of data ********************************
```

```
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Figure 2-71. Sample MICF Inquiries for Reporting Job Stream

Use this option to specify the MICF inquiries to be executed within the user reporting job stream. You can select any inquiry from the MICF shared inquiry catalog or from your own private inquiry catalog. Figure 2-71 (above) shows an example of shared MICF inquiries selected for daily RMF user reporting.

To begin, select option 2 from the "Inquiry Selection Options" panel.

Note: Once you have selected inquiries for your user reporting job stream, you can use Option 1 "Display Defined Inquiries" in future visits to both display the inquiries currently defined in the job stream, and add additional inquiries.

You can execute an inquiry using default execution-time parameter values. If the inquiry does not specify a default value for Database (DB) ID or CA MICS File Cycle(s), then the values you specify on the Reports and Graphics Jobstream panel will be used to execute the inquiry. The inquiries you select MUST have valid default values for all other execution-time parameters.

Alternatively, you can specify execution-time parameter overrides. Enter the E (Exec-Time) line command to display the associated execution-time parameters panel for an inquiry (see sample on next page). The execution-time parameter values you specify are saved with the production reporting job stream definition and are applied to the inquiry when the reporting job stream executes.

MICF marks the inquiries that have execution-time parameter overrides by showing *Specified* in the Exec-Time column of the Database Inquiries panel. As you can see on the sample above, execution-time parameter overrides have been defined for the RMFED1 inquiry and for both copies of RMFED5.

```
------------------------  Execution-Time Parameters  ------------------------
```

```
Command ===>                                                Scroll ===> CSR
```

```
Selecting CA MICS Inquiry: RMFED1 - MVS CPU and ASID Activity (.CSV)

--------------------------------------------------------------------------------
Enter one or more Database IDs for the Database(s) you want to process.
I                                    - ____________________________________
Enter range of CA MICS online file cycles or enter ARCHIVE for archive files.
01                                   - ____________________________________
Enter the SYSID(s) to be reported or leave blank to report all systems.
P                                                                      ______
****************************** BOTTOM OF DATA ********************************
```

```
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
```

Figure 2-72. Sample Execution-Time Parameters

If you want, you can execute a single inquiry against different DB IDs, file cycles, or other execution-time parameter values. Simply select the inquiry multiple times and specify different execution-time parameter overrides.

The sample in figure 2-72 shows that the RMFED1 inquiry is executed twice. The sample Execution-Time Parameters panel above shows the execution-time parameter overrides that might have been specified for one of the executions of the RMFED1 inquiry.

- The inquiry will execute against the P (PRIMARY) unit database and will select the 01 cycle.

- The inquiry will report on the production LPARS. That is, the inquiry will subset the available RMF data to observations with SYSID values that begin with the characters P (this inquiry is defined to subset based on leading characters).

- We can assume that the second execution of the RMFED1 inquiry might be limited to development (or test) LPARS, or to some other subset of the system workload.

You can use this technique of multiple inquiry executions under different execution-time parameters to create unique, tailored reports for different readers.

Once an inquiry has been added to the job stream, you can enter space parameters for individual inquiries. If omitted, they will default to the SAS work data set allocation for the job stream. If the SAS work data set has not yet been defined for the job stream, the SAS work data set space allocation will default to your private MICF definition in your MICF Options, MWF;2;0;6.

You should also note that the archive (tape) option of the CA MICS file cycle(s) parameter is not valid for user reporting. MICF user reporting uses dynamic allocation to access CA MICS files, and CA MICS does not support dynamic tape drive allocation.

2.7.3 Automatic MICF Inquiry Generation

Exclusive to the User Reporting Jobstream facility is the ability to automatically generate MICF inquiries from your own independent SAS source code or Q&R developed queries, and include them in your user reporting job stream.

These automatically generated MICF inquiries are always written to your private inquiry catalog.

2.7.3.1 Prerequisites

The Automatic MICF Inquiry Generation feature of the User Reporting Jobstream facility has the following requirements:

- The independent SAS code (program) or Q&R developed query must reside in a PDS accessible to MICF.

- The SAS code must be completely self-contained, that is, it must provide its own file allocations, such as a LIBNAME statement to allocate any CA MICS databases that may be required by the program.

- These inquiries cannot use execution-time parameters.

2.7.3.2 Using Automatic MICF Inquiry Generation

To use the Automatic MICF Inquiry Generation feature of User Reporting Job Stream, perform the following:

1) Select your User Reporting Job Stream from the User Reporting Administration Panel, or Insert a new one.

2) Enter a Y in the "Specify Inquiries for Reporting Jobstream" and press ENTER.

3) From the Inquiry Selection Options menu, select Option 3: "Select Source for Automatic Inquiry Generation" and press ENTER.

   The "Inquiry Generation - Define Source Data Sets" panel (Figure 2-73) is displayed. Here you will specify the name of your source data set as input to the Inquiry Generation feature.

Note: The Automatic Inquiry Generation Option is also available directly from MICF as option 6 (MWF 2;6.) MWF Option 2.6 functions the same, however the generated MICF inquiries are not added to a User Reporting Job Stream. MWF Option 2.6 is useful when you intend to promote the inquiries to the Shared Inquiry Catalog to include in a Production Reporting Job Stream.

```
---------------- Inquiry Generation - Define Source Library -------------
```

```
Command ===>                                                 Scroll ===> CSR

   ****************************************************************
   *                                                              *
   *            Define Inquiry Input Source Library               *
   *                                                              *
   ****************************************************************

Input Data Set Name   ===> 'userid.SASSRC.PDS'


Default Catalog Group Name   ===> QUERIES

Default Catalog Group Title  ===> User Defined Queries



Press ENTER to allocate the input library and select the members to
process in the user reporting job stream.

or

Press END to cancel.
```

```
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Figure 2-73. Sample Define Source Data Sets

4) On the "Inquiry Generation - Define Source Data Sets" panel, the data set name of Q&R query data set included with the CA MICS complex should already be defined. An additional line is included for a user-defined data set. This data set defaults to the last value entered, or blank, if this panel has not been visited previously.

   If the data set names are not enclosed in quotes, and your TSO profile includes a PREFIX, the prefix is added to the data set name.

5) Select or enter the Default Catalog Group Name under which the inquiry is saved.

   This field is a 1-8 character name and is required. This field defaults to the last value specified for this parameter.

6) The Catalog Group title is a 1-40 character name that describes the catalog group, and is required. This title defaults to the last value specified for this parameter.

   When the Catalog Group is selected from the table display at the bottom of the panel, the Default Catalog Group title is automatically populated based on the Catalog Group selected. This title can also be entered manually.

   After you have completed this panel, press END. MICF dynamically allocates and processes these data sets. The results are presented in a tabular form to allow you to select members, rename inquiries, and define the inquiry generation method you want to use for each inquiry.

   See the next section, 2.7.3.3 "MICF Inquiry Generation Member Selection," for more information about completing the member selection process.

2.7.3.3 MICF Inquiry Generation Member Selection

Once you have completed the "Inquiry Generation - Define Source Library" panel and pressed ENTER, the results are displayed in a subsequent table display (Figure 2-74) of your partitioned data set (PDS or PDSE.)

```
Command ===>                                                  Scroll ===> CSR

       Catalog Group:  BATCH
 Catalog Group Title:  Batch Catalog

                                  Replace Existing Inquiry ===> NO  (YES/NO)

 Line Cmds: B Browse  S Select  U Unselect


      Member   Query     Execute
 Cmd   Name    Name     From PDS?            Query Title
  -    -------  ------   ---------  ----------------------------------------

  _   #TSTEMP1 +EMPTYS      NO     zOS Daily Top 10 Service Classes
  _   #TSTEMP2 +EMPTYS      YES    Empty File Report
  _   #IBDAILY2+IBDAIS      NO     User Reporting Generated Query
  _   #MQRHOST +MQRHOS      YES    User Reporting Generated Query
  _   #NEWQRM4 +RMFQRS      NO     zOS Daily Service Classes
  _   #RMFCPU  +RMFCPS      NO     RMF CPU Busy
  _   #RMFCSV  +RMFCSS      NO     User Reporting Generated Query

 . . . . . .
```

Figure 2-74. Sample Source Member Selection

The columns of this table display are described as follows:

Member Name: The name of the member as it exists in your PDS library. This name cannot be modified.

Query Name: If the member processed contains a Q&R developed query, the query name was derived from the MQR header included when the query was saved. Otherwise, the query name defaults to the first six characters of the member name.

Query Name can be modified to avoid conflicts with other members within this same PDS and MICF inquiries that may already exist in your private inquiry catalog. Query name must be unique.

Execute from PDS?: Defaults to NO. This field allows you to control the way the MICF inquiry is generated. There are two methods:

1) When generating the inquiry, insert an independent SAS step in the inquiry that contains an %INCLUDE statement to the library and member that contains the code or Q&R query. Specify a Y in this column if you prefer to use this method.

   The use of the SAS %INCLUDE statement allows flexibility for those users inexperienced in MICF. Using this method eliminates the need to revisit MICF to modify the inquiry (source code), as it is read at execution time directly from the external PDS.

2) Embed the code within MICF. The embedded code is the default. Each line of the source code is written to an ISPF table stored within MICF as an Independent Source step.

   To modify the inquiry, once it has been generated requires a subsequent visit to MICF. Select MICF Database Inquiries (MWF;2;2) and select the inquiry (S or M line commands) to see the individual steps. Select the Independent Source Statements step to modify the SAS code. Your modifications is saved when you use the END key (or command) to exit.

   Alternatively, you can revisit the Automatic Inquiry Generation Option of MWF (2;6) to replace the existing inquiry using the contents of the corresponding PDS member.

Query Title: If the member processed containes a Q&R developed query, the Query Title is derived from the query title in the MQR header included when the query was saved.

Otherwise, if the Automatic Inquiry Generation Option was executed from MICF (MWF;2;6), the query title defaults to "MICF Generated Query". If the Automatic Inquiry Generation was executed from within a User Reporting Job Stream, (MWF;2;5), the query title defaults to "User Reporting Generated Query." A query Title can be modified from this panel and does not need to be unique.

From this panel, you can select, the S line command, for those members that you want to generate MICF inquiries, and include them in your user reporting job stream.

Note: Generated MICF inquiries are always written to your private inquiry catalog. If you are executing this option from MICF (MWF;2;6), the inquiries are generated and written to your private inquiry catalog, but they are not added to any User Reporting Job Stream.

After selecting members and modifying any of the columns you want to change ,
press ENTER. For example, query name or query title. MICF validates your selections using the
following criteria:

- The selected members are compared to ensure that there are no duplicate query names selected. If duplication occurs, a message to that effect is issued and the cursor is placed at the offending row, and marked with an E.

  To resolve this error condition, use one of the following methods:

  - Use the U line command to deselect one of the duplicate members.

    - OR -

  - Change the name of one of the selected members by overtyping the name in the Query Name column, and use the S line command to select the member again.

- Additional checking is performed to ensure a MICF inquiry does not already exist with the same name as the name in the Query Name column. When a duplicate name is found, the selected

members are identified by an "E" in the CMD column.

To resolve this error condition, use one of the following methods:

- Set the Replace Existing Inquiry option to Y (YES) to replace the existing MICF inquiry.

  - OR -

- Change the name of one of the selected members by overtyping the name in the Query Name column, and use the S line command to select the member again.

After validation is complete, press END to generate MICF inquiries from the selected members.

If you are executing this option directly from MICF (MWF;2;6) the inquiries are generated into your private MICF inquiry catalog. If you are executing this option from within User Reporting Job Stream Administration (MWF;2;5), the inquiries are generated into your private MICF inquiry catalog AND added to your User Reporting Job Stream.

Upon successful completion, you receive the message, "Inquiry Generation Complete."

2.7.4 Executing a User Reporting Jobstream

You can use the G (Generate) line command for on-demand user reporting execution, or to generate execution JCL that you can save for later submission by your site's batch scheduling facilities.

MICF user reporting job stream execution JCL is simple. The most basic form (use the G line command for a sample) consists of a Job statement, an execute statement for the MICSRPTS cataloged procedure, a DD statement to allocate the catalog table data set associated with the user reporting job stream, and a DD statement to allocate your User ISPF Tables data set, which is where your private catalogs reside. Printed report, color graphics catalog, and CSV output data sets are dynamically allocated.

```
//jobname JOB (........
//MICF    EXEC MICSRPTS
//SYSTSIN  DD DISP=SHR,
// DSN=sharedprefix.MICS.SOURCE(ICFU100)
//ICFRPT1  DD DISP=SHR,
// DSN=userid.RMFUJOB.CATALOG
//MWFUTABL DD DISP=SHR,
// DSN=userid.MICS.USER.TABLES
```

Note: MICF inquiry user reporting is a batch terminal monitor program (TMP). That is, to run MICF inquiry user reporting, you execute TSO and ISPF in batch mode. This makes the process sensitive to maintenance levels of TSO and ISPF. You can encounter problems if your TSO or ISPF product maintenance is out-of-date.

By default, this job will record the return code from each MICF inquiry execution as well as any internal processing errors. It will post the highest return code as the completion code for the batch job step. If you prefer to have the job end with a U0998 termination code when any errors are encountered, you can override the MAXRC symbolic parameter on the EXEC statement as shown below:

```
//jobname JOB (........
//MICF    EXEC MICSRPTS,MAXRC='N'
```

2.7.5 Deleting Reports and Graphics Output

You will not normally need to delete user reports and graphics output. Expired cycles (as defined by the Maximum Report Retention parameter on the Reports and Graphics Jobstream panel) are deleted when you execute the reporting job stream. However, you may occasionally encounter rerun situations that leave an invalid or partial reporting cycle in the catalog.

You can use the D (Delete) line command to delete an entire reporting cycle, individual reports, graphics and CSV output, or the user reporting jobstream definition and ALL saved reports and graphics outputs. The D (Delete) line command displays the delete confirmation menu.

- Choose option 1 (Delete User Reporting Jobstream) to delete the user reporting jobstream definition.

Note: Do NOT use this option unless you want to delete ALL saved outputs AND the user reporting jobstream definition.

- Choose option 2 (Delete Saved Outputs) to delete a reporting cycle or individual reports and graphics outputs.

- Choose option 3 (Delete Saved Outputs and MWP Cycles) to delete an entire reporting cycle and the associated MICF Web Publishing output for that cycle.

Note that both option 1 and option 3 attempt to remove MICF Web Publishing output.

o If the output is successfully removed, the remaining output available from MICF Reports and Graphics will also be deleted.

o If the output is not successfully removed, the log file created during the delete operation will be displayed, and you will have to identify and correct the problem. Processing will not continue.

After correcting any problems, you can use option 1 or 3 again, or select option 2 to skip removal of the MICF Web Publishing output and only remove the output available to MICF Reports and Graphics.

2.7.6 MICF Web Publishing

The following section describes the MICF Web Publishing (MWP) feature. MWP takes the output from MICF inquiries executed using MICF Production Reporting or the User Reporting Jobstream feature and converts it to HTML for presentation using a standard web browser. Using MWP, new and existing MICF reports can be made available to end users, giving them unprecedented access to reports needed to manage I/T resources.

Review all of these topics before using this feature.

1 - Prerequisites
2 - Setup
3 - Style Usage
4 - Directory Structure
5 - Usage Notes

2.7.6.1 Prerequisites

MICF Web Publishing has the following requirements:

- Available space in a Hierarchical File System (HFS) directory.

- A Web browser that supports frames and Javascript. This includes Netscape V5 or higher and Microsoft Internet Explorer V5 or higher.

2.7.6.2 Setup

```
The following checklist is used to create and initialize the
MICF Web Publishing Root Directory before use.

___ 1. Ensure that the CA MICS Root Directory has been
       created and initialized.

       Refer to PIOM Section 5.7 for further information
       regarding the activation of CA MICS USS and HFS
       support.

 ___ 2. Create the MICF Web Publishing root directory.

       You can use the UNIX mkdir command to create the
       CA MICS Web Publishing root directory in your HFS.

       For example:

       mkdir -p /u/users/MICS/MWP_root

___ 3. Edit the job in sharedprefix.MICS.CNTL(MWPDIRIN).

       This job is used to copy image files to the MICF Web
       Publishing root directory.  If this job is not run,
       then the resulting HTML documents may not display
       properly.

       Change the MWPROOT parameter on the MWPCOPY EXEC
       statement to specify the name of the MWP root
       directory.

       Submit the job and ensure it completes with a
       return code of zero.
```

2.7.6.3 Style Usage

```
MICF Web Publishing exploits the SAS Output Delivery System
(ODS).

One of the most powerful features of SAS ODS is its
ability to allow the user to control the appearance of
HTML document elements using a style definition.

Common modifications that can be made using styles are:

o Provide a customized background color or image
```

o Control the font style, color, enhancement and size for numerous items in the document

o Provide an image and/or text at the top and/or bottom of a page, like a corporate logo.

In addition to the SAS provided style definitions, user created style definition can be used with MICF Web Publishing. User style definitions can either be stored in the SASHELP.TMPLMST or the MCOLIB.TEMPLTE item store. Note that MCOLIB refers to sharedprefix.MICS.MCOLIB.

Further information regarding the use of styles can be found either on the SAS Technical Support Web site or in the SAS documentation.

MWP allows different style definitions to be assigned to the master index, and the inquiry output display. These options can be sent from the Execution Options panel. See Section 2.7.1.2.3.

2.7.6.4 Directory Structure

MICF Web Publishing (MWP) stores all its information in an HFS directory and should not be used by other applications. MWP builds a specific directory to store its presentation information.

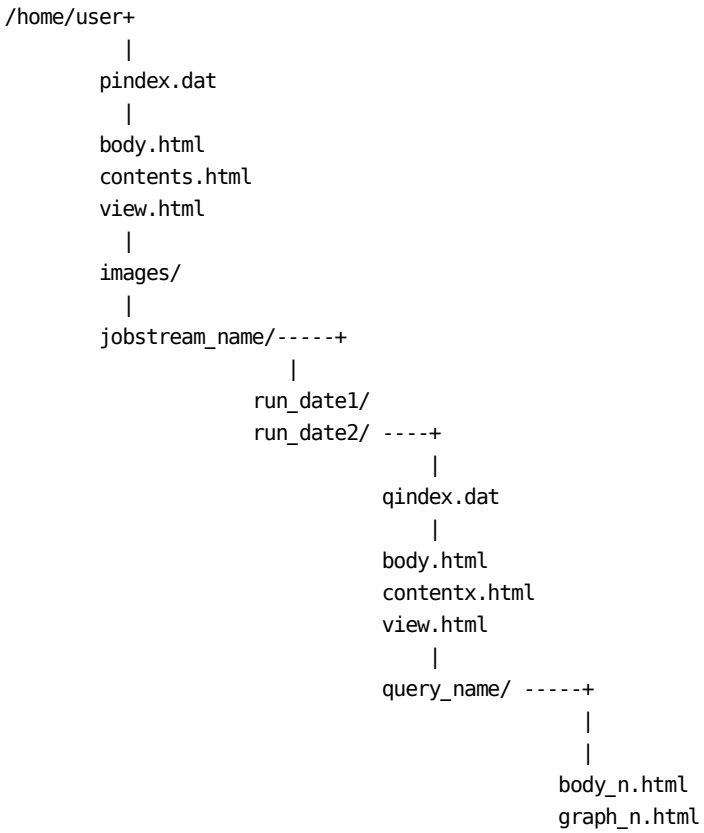


Figure 2-75. HFS Directory Structure for MICF Web Publishing

MWP_root is the name of a directory where MWP stores all your reports and graphics. Note that the MWP_root does not have the same name as the CA MICS root directory. If you want to store MICF Web Publishing output in the CA MICS root directory, it is strongly recommended that MWP output be stored in a subdirectory within the CA MICS root directory.

For example, if the CA MICS root directory is /u/mics, the MWP root directory could be specified as /u/mics/MWP_Output.

The MWP root directory must be created before executing MICF Web Publishing. It contains:

o pindex.dat -- index of user reporting job streams contained within this root directory.

o body.html, contents.html, view.html -- HTML page for the master index of this reporting job stream.

o images/ -- directory for image files used for html
  presentation.

o jobstream_name -- directory containing information for a
  given reporting job stream.

Each jobstream_name directory contains one directory for each reporting job stream execution using the format DddmmmyyThhmm, where ddmmmyy is the run date and hhmm is the time.

Each jobstream_name directory contains:

o qindex.dat -- directory of queries executed in this run.

o body.html, contentx.html, view.html -- HTML used to display
  query output.

o query_name/ -- one directory for each MICF query executed
  in the reporting job stream. The directory name has the
  format cccccc.n, where cccccc is the query name and n is a
  unique number. This allows for the same query to be
  specified more than once in a reporting job stream.

  Note: The inquiry name must NOT include the '#' character.
  The '#' character is interpretated by the UNIX environment
  as a command, and will cause an error during the WEB
  publishing process.

Each query name directory holds the body and graph files generated during execution.

2.7.6.5 Usage Notes

o When using the IBM HTTP Server, a virtual directory can be
  created to point to the MWP Root Directory by adding a Pass
  directive in the configuration file.

  For example, by adding the following line to the
  configuration file for the IBM HTTP Server:

  Pass   /CA_MICS_MWP/*   /u/users/ca_mics/MWP_Root/*

  users can access the directory /u/users/ca_mics/MWP_Root by
  the virtual name, CA_MICS_MWP.

This accomplishes two goals. First, the MWP Root Directory does not have to physically exist in the home directory of the HTTP server. Second, users will only need to remember the URL of the virtual directory, allowing the physical name to be changed without their knowledge.

Virtual directories are supported by most web servers, including the IBM HTTP Server.

- The page MWP_root/view.html is considered to be the home page for all reporting streams in the MWP Root Directory.

- MICF Web Publishing allows the use of multiple MWP Root Directories. However, there is currently no index of root directories.

- The directory MWP_root/stream_name/MWP_current always points to the most recent execution of a given reporting stream.

- The page MWP_root/stream_name/DyymmddThhmm/view.html contains the html to view the output for a reporting stream for a specific execution.

  NOTE: The page name defaults to "view" but can be changed from the Execution Options panel of the User Reporting Jobstream.

- If a reporting stream has MICF inquiries that generate graphics using SAS/Graph, the "Generate Graphics for MICF Web Publishing" option on the Execution Options panel must be set to Y. Otherwise, the graphs will not be shown.

- If you are providing a custom background image, it can be placed in the images/directory.

2.7.7 - Q&R Integration

The Q&R Integration feature writes MICF inquiry output generated from a production or user reporting job stream to a HFS/zFS directory structure compatible with the CA MICS Q&R Workstation.

This feature utilizes IBM's NFS (Network File System) and Microsoft Windows' CIFS (Common Internet File System) to share UNIX files between the two operating systems. These remote z/OS UNIX files are mounted from the mainframe to appear as local directories or files on the client system.

The NFS uses the communication services provided by TCP/IP, a suite of protocols that includes the remote procedure call (RPC) and External Data Representation (XDR) protocols. RPC allows a program on one machine to start a procedure on another machine, as if the procedure is local. XDR resolves the differences in data representation of different machines. The NFS, then, can be used for file sharing between platforms and file serving (as a data repository).

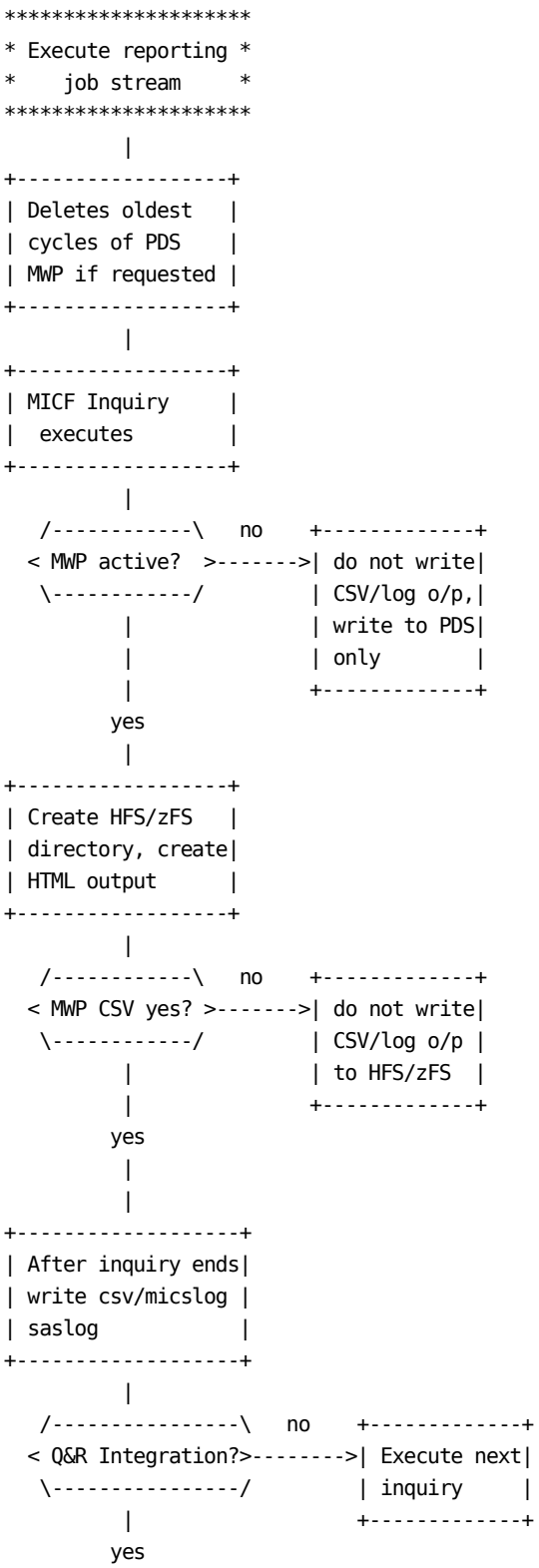
The Q&R directory structure, coupled with the ability to map the Q&R HFS/zFS directory as an additional drive to the Q&R distributed server, allows the RMWSLOAD utility to read directly from the HFS/zFS directory without moving the data to the distributed server for publication of chart and report output.

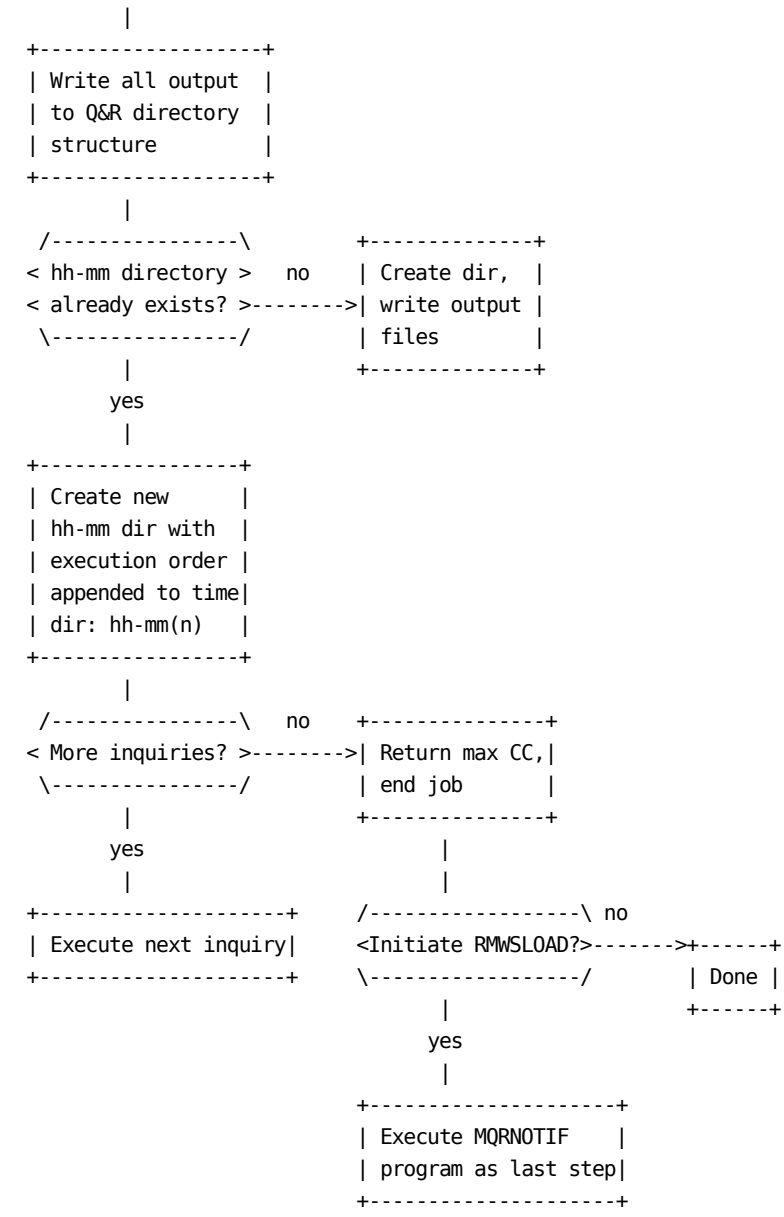
For more information on RMWSLOAD, see the Q&R Workstation Administration Guide.

Additional benefits include direct viewing of the directory from Q&R Output Retrieval (see the next section for more information on Output Retrieval.) You do not have to run RMWSLOAD to access job stream output unless you are ready to publish to your web server. This lets you generate View Definition Files to perfect the look of the chart prior to publication.

Finally, sharing the HFS/zFS directory between your z/OS UNIX (USS) environment and Microsoft Windows lets you publish all your CA MICS output (either MWP or Q&R) to one web server, Microsoft Internet Information Services (IIS).

Below is a general overview of the job stream processing.


****
* Execute reporting *
*   job stream   *
****
Deletes oldest cycles of PDS MWP if requested
MICF Inquiry executes
MWP active?
no
do not write CSV/log o/p, write to PDS only
yes
Create HFS/zFS directory, create HTML output
MWP CSV yes?
no
do not write CSV/log o/p to HFS/zFS
yes
After inquiry ends write csv/micslog saslog
Q&R Integration?
no
Execute next inquiry
yes



The MQRNOTIF program notifies the Q&R mainframe server that the job stream has completed. The mainframe server notifies the distributed server to begin executing the corresponding RMWSLOAD job.

o If you are using the Q&R directory structure, RMWSLOAD is scheduled and publishes the output to your web server.

o If you are using the DTF index as the interface to RMWSLOAD, RMWSLOAD downloads your reporting job stream

```
  output and then publishes the output to your web server.

Review all of these topics before using this feature.

1 - Prerequisites
2 - Setup
3 - Directory Structure
4 - Usage Notes
5 - Q&R RMWSLOAD
```

2.7.7.1 Prerequisites

```
 Q&R Integration has the following requirements:

o Available space in a Hierarchical File System (HFS/zFS)
  directory on a hardware device that can be accessed by a
  Microsoft Windows distributed server machine.  This UNIX
  directory must be mapped to a drive on the Q&R distributed
  server for direct access by the distributed server.  This
  facilitates execution of RMWSLOAD to directly read the
  files in the HFS/zFS directory for subsequent publication.

  Sharing files between z/OS USS and a Windows client (Q&R
  Workstation) requires the use of IBM z/OS NFS (Network
  File System).

  The NFS server enables the client user, remote access to
  z/OS UNIX file files from a client workstation.

o Ability to start the distributed server with USS
  credentials that have the authority to access the HFS/zFS
  directory in order to read the reporting job stream
  output.  This is only necessary to access the MICF generated
  output directly from Q&R Query Output Retrieval.

  Note:  Without the ability to share the drive with a
  Windows machine, you cannot take advantage of any
  integration features.

o The ability to export the HFS/zFS USS directory and map it
  to the Windows machine running the Q&R distributed server
  every time the machine is restarted (persistent connection).

o The installation of the Q&R Workstation feature of CA MICS
  Release 12.7.
```

2.7.7.2 Setup

The following checklist is used to enable the connection from MICF Reporting Job Stream output to Q&R Workstation.

___ 1. The root directory must be located on a hardware device that supports sharing between your mainframe UNIX environment and a Windows environment, such as a NAS (Network Attached Storage) device.

___ 2. Create a USS File System to store the MICF generated output to be processed by the Q&R Workstation.

NOTE: The FILESYSTYPE should be TYPE(NFS).

With the z/OS NFS server, the client has remote access to z/OS UNIX files from a client workstation. Using the Network File System, the client can mount all or part of the file system and make it appear as part of its local files system.

See the IBM Unix System Services guide for documentation on creating and mounting a shared file system and the IBM NFS (Network File System) Guide and Reference for information on using, customizing, operating, tuning, and diagnosing the z/OS Network File System (z/OS NFS).

___ 3. Map this device to your Q&R distributed server machine. It can be mapped using Windows Explorer, Map Network Drive or by using the NET USE command. Either way, the drive must be allocated so it is available whenever the server machine is restarted.

___ 4. To view output created by a MICF Reporting Job Stream directory from Q&R Query Output Retrieval, you must start the Q&R distributed server using credentials authorized in the mainframe UNIX (USS) environment to access the files in the HFS/zFS directory. This is not necessary for RMWSLOAD only access.

___ 5. Review the Shared MICF Options, Foreground Execution Parameters definitions to assign defaults to be used for defining reporting job streams and the MICF Web Publishing and Q&R Integration options.

___ 6. Review any existing reporting job streams and modify the MWP (MICF Web Publishing) and Q&R Integration execution options as needed.

```
        For example, you might want to have the Q&R Mainframe
        Server automatically notify the Q&R Distributed Server
        to schedule RMWSLOAD when the MICF Reporting Job
        Stream completes.

___ 7. Define the Q&R root directory to be used by the
        Q&R Integration feature.  This can be the same
        directory used by MICF Web Publishing.

        Refer to the PIOM Section 5.7 for further information
        on the activation of USS and HFS/zFS support.

        You can use this UNIX mkdir command to create the Q&R
        Integration root directory in your HFS/zFS:

        mkdir -p /u/users/CAMICS
```

2.7.7.3 Directory Structure

Q&R Integration stores all its information in an HFS/zFS directory and should not be used by other applications. This interface builds a specific directory structure required by the Q&R distributed server.

Note: The inquiry name must NOT include the '#' character. The '#' character is interpreted by the UNIX environment as a command, which causes an error.

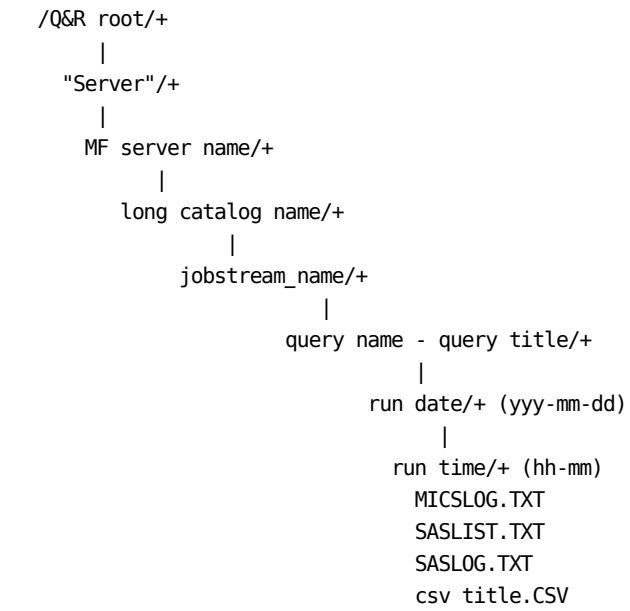


Figure 2-75. HFS/zFS Q&R Integration Directory Structure

Q&R root is the name of a directory where the Q&R Integration feature stores MICF inquiry output for access by the Q&R Workstation. The Q&R root can be the same as the MICF Web Publishing root directory as they write different directory structures. Typically you would not activate both MWP and Q&R Integration unless you are migrating from the use of MWP to Q&R to take advantage of the Q&R charting capabilities.

The Q&R root directory must be created before activating this feature and executing your reporting job stream.

Each "query name - query title" directory contains a subdirectory of run date and run time, using the format yyyy-dd-mm/hh-mm.

Each time directory (hh-mm) contains the inquiry output generated during execution. HH-MM is the time of the job stream execution and may not represent the actual time the inquiry itself executed.

- MICSLOG.txt
- SASLIST.txt (if no report was generated, it will be empty)
- SASLOG.txt
- csv title.CSV

Multiple CSVs can be created in the same MICF inquiry, but must have different titles.

Note: If a job stream contains multiple instances of the same inquiry, for example an inquiry executed multiple times for different units, the nth execution is stored under the hh-mm time with the execution order appended to the directory name. This allows you to differentiate one inquiry output from another by the order in which they executed. For example:

```
. . . ./RMFED1 - MVS CPU and ASID Activity (.csv)
        /2011-09-01
         /10-19
           MICSLOG.txt
           SASLIST.txt
           SASLOG.txt
           Daily - MVS ASID Activty by System.csv
           Daily Percent CPU busy by System.csv
         /10-19 (4)
           MICSLOG.txt
           SASLIST.txt
           SASLOG.txt
           Daily - MVS ASID Activty by System.csv
           Daily - Percent CPU busy by System.csv
```

2.7.7.4 Usage Notes

o The intent of creating the Q&R compatible directory
  structure is to facilitate access by the Q&R Workstation.
  It is assumed that this directory is accessible from your
  Microsoft Windows Q&R distributed server machine.

  Important! Although you can delete reports on-demand using
  the Reporting Jobstream Administration option on the MICF
  menu, no automatic aging or deletion exists on the
  mainframe side. It is expected that the Q&R utility
  RMWSPARE will be used as needed to remove output from the
  Q&R directory structure written to the HFS/zFS. If you are
  unable to map this HFS/zFS directory to a Windows machine,
  do not deploy this feature.

o As mentioned above, MICF supports deleting output in this
  directory structure in addition to the MWP directory
  structure that previously existed. However, since the job
  stream name is not the highest level within the Q&R
  directory structure, it is possible that, after executing a
  delete request, some directories might remain. The delete
  program can only delete non-empty directories. You should
  use the Q&R RMWSPARE utility to remove unwanted output.

2.7.7.5 Q&R RMWSLOAD

Regardless of whether you choose to write the reporting job
stream output as zFS files (Q&R compatible directory
structure) or use the DTF Index method to make the output
available to the Q&R RMWSLOAD utility, you can automate
notification to Q&R when the output is available.

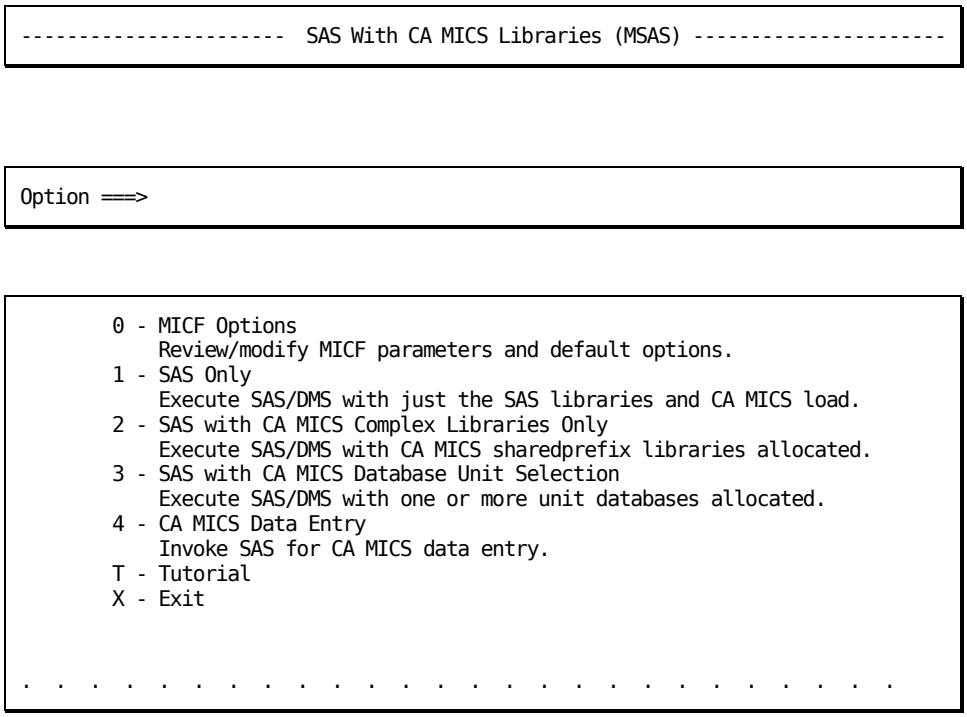
From your reporting job stream Execution Options panel,
modify the following options to enable automatic notification
from the Q&R Mainframe Server to the Q&R Distributed Server
that the job stream has completed and the output is ready to
be published.

Q&R Mainframe Svr (MQRMSN)===> ________

Optional. The application name of the CA MICS Q&R Mainframe
Server. This is defined in the Q&R Mainframe Server
parameter file (sharedprefix.MICS.PARMS member MQRPARMS) as
the MQRMSN parameter. If "Use Q&R Compatible Directory
Structure" is Y, the MQRMSN value is used as the first
directory level after "Server" when building the Q&R
directory structure.

```
If "Initiate RMWSLOAD"  is Y, this is the Q&R Mainframe
Server that will be notified when the job stream completes.
It does not have to be executing on the same system as the
job stream.

Required only when "Initiate RMWSLOAD"  is Y, or "Use
Q&R Compatible Directory Structure" is Y.

Initiate RMWSLOAD         ===> N (Y/N)

Required.  Specify Y (Yes) to notify the
Q&R Mainframe Server when the job stream has completed in
order to execute the related RMWSLOAD job.  Defaults to N.
You do not have to use the Q&R directory structure to use
this feature.

RMWSLOAD Job Name         ===>

Optional.  The job name defined in Q&R Workstation that
corresponds to the job stream output you wish to publish.
See the Q&R Workstation Administration Guide for more
information on the RMWSLOAD utility.  Required only when
"Initiate RMWSLOAD"  is set to Y.  Defaults to the name of

this job stream.
```

Chapter 3: Interactive Reporting (MSAS)



Interactive access to SAS with CA MICS is provided through the MSAS dialog from the CA MICS Workstation Facility (MWF). The MSAS dialog, running under ISPF, allows experienced SAS users to exercise a flexible set of options for invoking interactive full-screen SAS in the CA MICS environment. The MSAS dialog supports several types of interactive reporting, including:

- read-only access to a single unit database
- read-only access to multiple unit databases
- SAS without any unit databases

To support the interactive use of SAS with CA MICS, MSAS allocates the required SAS files, work files, user files, sort files, CA MICS libraries, and, optionally, the CA MICS database. In addition to allocating CA MICS database files, MSAS uses the standard CA MICS DDNAMEs (for example, SOURCE, INCLLIB, and USOURCE) to allocate the CA MICS library data sets. This lets you select SAS statements from the CA MICS libraries, modify and execute these statements under SAS/DMS, and then save the program for future use.

MSAS is a MICF application running under your private MICF options. Through MICF Options, you can control the set up of SAS execution parameters and temporary data set allocations. You can also control the allocation of additional data sets for one-time or repeated use.

To use MSAS, select option 3, SAS With CA MICS Libraries, from the MWF menu. From the MSAS menu, you can select option 0 to review your MICF options or options 1 through 4 for the type of SAS interaction desired.

The SAS Display Manager Program Editor/Log panel displays. You enter SAS statements into the program editor area and submit them for execution using the SUBMIT command or key. The statements are executed in the foreground and the SAS log is updated on the upper half of the display. If printed output is produced, SAS automatically puts you into browse mode on the output. When you are finished using SAS, issue the BYE command to return to the MSAS main panel. (Use of the SAS Display Manager is documented in SAS guides.)

You can also use SAS/DMS facilities directly from MICF. MICF allows you to execute any inquiry under SAS/DMS. Once in SAS/DMS, you can browse CA MICS files, view/update temporary files created by the inquiry, and generate additional reports and color graphics. In addition to providing many capabilities of MSAS, the MICF SAS/DMS execution option gives you the advantage of being able to catalog report and graphics output from SAS/DMS processing. See Section 3.7 for more information on SAS/DMS.

The sections that follow discuss the use of each of the MSAS menu selections, as well as Display Manager commands and information on using SAS/DMS from MICF. An online tutorial and help panels are also provided from the MSAS dialog.

This section contains the following topics:

3.1 SAS Only

Option 1 of MSAS invokes SAS using only the allocations needed to run SAS in full-screen mode. Use the SAS Only option to execute SAS/DMS without allocating CA MICS libraries or database files. The only CA MICS library allocated by this option is sharedprefix.MICS.LOAD.

MSAS will allocate the SAS libraries you defined for CA MICS and the work files normally required by CA MICS and SAS (for example, WORK and FT15F001) before invoking SAS/DMS. MSAS will also allocate the SAS libraries and additional data set allocations you requested through MICF options.

When you select Option 1, MSAS performs the appropriate allocations and displays the SAS Display Manager panel. At this point, you have control of SAS until you issue the BYE command to return to the MSAS main panel.

This option is provided mainly to allow you to try SAS execution without using the CA MICS libraries. It can also be used for other on-demand situations.

3.2 SAS with CA MICS Complex Libraries Only

Option 2 of MSAS invokes SAS with the CA MICS complex-level (sharedprefix) libraries allocated, but without the allocation of any databases or unit-level (prefix) libraries. The sharedprefix CA MICS libraries are allocated to the standard CA MICS DDNAMEs: SOURCE, SASAUTOS, INCLLIB, LOAD, and SHRPARMS. Optional SORTWKnn and sort control data sets are allocated according to your MICF Options and CA MICS complex definitions.

MSAS will allocate the SAS libraries you defined for CA MICS and the work files normally required by CA MICS and SAS (for example, WORK and FT15F001) before invoking SAS/DMS. MSAS will also allocate the SAS libraries and additional data set allocations you requested through MICF options.

When you select Option 2, MSAS performs the appropriate allocations and displays the SAS Display Manager panel. You now have control of SAS until you issue the BYE command to return to the MSAS main panel.

3.3 SAS with CA MICS Database Unit Selection

```
------------------------  Execution-Time Parameters  ------------------------
```

```
Command ===>                                                  Scroll ===> CSR
```

```
--------------------------------------------------------------------------------
  Enter one or more Database IDs for the Database(s) you want to process.
?_____________________________________ - _____________________________________

******************************** BOTTOM OF DATA ********************************
```

```
.  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Option 3 of MSAS invokes SAS with the CA MICS complex-level (sharedprefix) libraries allocated and with database files and libraries for one or more CA MICS unit databases allocated. Use the CA MICS DDNAME macros to reference the database files. The sharedprefix CA MICS libraries are allocated to the standard CA MICS DDNAMEs: SOURCE, SASAUTOS, INCLLIB, LOAD, and SHRPARMS. The prefix.MICS.USER.SOURCE libraries are allocated to USOURCE. Optional SORTWKnn and sort control data sets are allocated according to your MICF Options and CA MICS complex definitions.

SAS will allocate the SAS libraries you defined for CA MICS and the work files normally required by CA MICS and SAS (for example, WORK, FT15F001, etc.) before invoking SAS/DMS. MSAS will also allocate the SAS libraries and additional data set allocations you requested through MICF options.

When you select option 3, the MICF Execution-Time Parameters panel (above) is displayed for you to select the unit databases you want allocated. You can select one or more databases by entering one or more unit database (DB) IDs in the data entry area. (Enter ? on the Execution - Time Parameters panel to see a list of available unit databases, as illustrated on the next page.)

When you are finished with unit selection, issue the END command (or press the END PFkey) to invoke SAS.

MSAS then performs the appropriate allocations and displays the SAS Display Manager panel. You now have control of SAS until you issue the BYE command to return to the MSAS main panel.

```
---------------------------  Database Selection  ----------------------------
```

```
Command ===>                                                  Scroll ===> CSR

Executing CA MICS Inquiry: MSASDB - SAS with CA MICS Database Unit Selection
```

```
Line Cmds: S Select

     -Database-
Cmd  ID  Label                    Database Title (long name)
 -   -- --------  ------------------------------------------------------------
```

```
 _   C  CICS      CA MICS CICS DATABASE
 _   D  DASD      CA MICS DASD DATABASE
 _   I  IMS       CA MICS IMS DATABASE
 _   P  PRIMARY   CA MICS PRIMARY DATABASE
 _   R  REMOTE    REMOTE DATA CENTER
******************************** BOTTOM OF DATA ********************************
```

```
. . . . . .
```

3.4 CA MICS Data Entry

Option 4 from MSAS is used to invoke the Data Entry process for certain CA MICS files. See Section 4.4.5 of the PIOM for more information.

3.5 MICF Options

Option 0 of MSAS presents the MICF Options menu. MICF Options lets you change the parameters controlling information retrieval and reporting under MICF. MICF Options is provided on the MSAS application menu so you need not exit from MSAS to modify your MICF parameters. MSAS operates under the MICF environment, and the MICF parameters apply to SAS/DMS execution and manual data entry.

See MICF Options in the MICF Reference Guide.

3.6 CA MICS Display Manager Commands

When using the MSAS dialog with CA MICS libraries, several additional Display Manager commands are available from the sharedprefix.MICS.MACAUTOS library. These commands are SAS auto-call macros, which permit users greater flexibility or programming extensions in the use of the SAS Display Manager environment.

The commands can be entered on the COMMAND line of the PROGRAM window of the SAS Display Manager.

Note: These commands are not normally available if you select SAS ONLY from the MSAS primary menu (Option 1) because the sharedprefix.MICS.MACAUTOS data set is not allocated to the SASAUTOS DDname for this option. To add this option, specify sharedprefix.MICS.MACAUTOS as a private auto-call macro library under SAS Libraries for ISPF Applications in the MICF Options dialog.

The following Display Manager commands are discussed:

- CONFIG
- LISTA
- PDF

CONFIG

The CONFIG command displays the configuration of the CA MICS complex from which you are executing MWF (MSAS operates under MWF). This command displays an ISPF table that contains all CA MICS units defined to the complex. Along with the unit prefix and components installed in each unit, all SYSID values known to the unit are also displayed.

LISTA

The LISTA command produces a listing of all data sets that are allocated under your TSO session. This command is similar to the TSO LISTA command except that the output is directed to the SAS Log so that you can scroll through the listing of allocated data sets.

PDF

The PDF command allows you to access the ISPF primary menu from within the SAS Display Manager environment without terminating the SAS session. From the ISPF primary menu, you can access any dialog that can normally be accessed from that selection menu.

NOTE ON THE USE OF PDF FROM SAS:

Depending on the configuration your CA MICS administrator chose when installing the CA MICS Workstation Facility (MWF), you may be able to reselect the MWF dialog from the ISPF primary menu.

NOTE: Do NOT reselect or nest MWF dialog invocations.
Unpredictable results can occur.

3.7 Using SAS/DMS From MICF

You can also use SAS/DMS facilities directly from MICF. MICF allows you to execute any inquiry under SAS/DMS. You get control (in SAS/DMS) after execution of the inquiry SAS statements completes. Once in SAS/DMS, you can browse CA MICS files, view/update temporary files created by the inquiry, and generate additional reports and/or color graphics.

In addition to providing many capabilities of MSAS, the MICF SAS/DMS execution option gives you the advantage of being able to catalog report and graphics output from SAS/DMS processing. When you execute your inquiry under SAS/DMS:

- The standard MICF Inquiry Output Replay menu is displayed after SAS/DMS processing is completed.

- All output written to the standard SAS print file (SASLIST) is saved in the MICF report file, where it can be browsed or printed. If you catalog the inquiry output, report output will be copied to your private inquiry output catalog.

- Specify the GOUT=&GCAT SAS/GRAPH parameter to direct color graphics to the SAS/GRAPH GREPLAY catalog associated with the current inquiry execution. You can replay color graphics outputs or route (print) color graphics to a hardcopy device. If you catalog the inquiry output, the associated color graphics will be saved in your private inquiry output catalog.

- CA MICS log output and the SAS log are also available to be browsed, printed, or saved with cataloged outputs.

See Section 2.4.2.1 of this guide for more information on executing MICF inquiries and the SAS/DMS execution mode option.

Chapter 4: Batch Reporting

There are several standard methods provided with CA MICS to use SAS to access a CA MICS database.

o Batch Execution
o Interactive Execution (MSAS)
o CA MICS Information Center Facility (MICF) Execution

This section discusses the JCL procedures available for batch reporting. Using MSAS for interactive reporting is covered in Chapter 3. Access through MICF is described in Chapter 2 and in the MICF Reference Guide.

JCL procedures are provided to support several types of batch reporting. The procedures provided are as follows:

MICSSHRx - Allows read-only access to a single database unit, where x is the database unit identifier defined in the prefix.MICS.PARMS(JCLDEF) member. For a complete description, see section 4.1.

MICSCOM - Allows read-only access to multiple database units. For a complete description, see section 4.2.

MICSDBx - Allows read/write access to a single database unit, where x is the database unit identifier defined in the prefix.MICS.PARMS(JCLDEF) member. For a complete description, see section 4.3.

MICSNDBx - Provides the same DD statements as MICSDB for SAS files, sort files, and CA MICS libraries, but does not provide any database access. For a complete description, see section 4.4.

This section contains the following topics:

4.1 Single Database Access (MICSSHRx)

The MICSSHRx procedure provides batch access to the database for reporting. Access is read only. There is one MICSSHRx procedure for each database unit in a database complex. They are all named MICSSHRx, where x is the database ID defined on the DATABASE statement in prefix.MICS.PARMS(JCLDEF).

The MICSSHRx procedure, stored in the installation PROCLIB, is executed in a standard batch job as shown below:

```
//STEP1 EXEC MICSSHRx
```

The only requirement for the user is to specify the SAS program that is to be executed,and that is done by defining the SYSIN DD statement.

```
//STEP1  EXEC MICSSHRx
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```

If you have special needs, you may use some of the options provided by the batch procedure. They are as follows:

LSYSOUT= SYSOUT class used for SAS log reports.
(default: LOGS definition in the JCLDEF member of prefix.MICS.PARMS)

OPTIONS= Facility to enable the user to specify any of the SAS PARM options, such as line size, etc.
(default: null)

RSYSOUT= SYSOUT class used for standard reports.
(default: REPORTS definition in the JCLDEF member of prefix.MICS.PARMS)

RSIZE= Region size for the step.
(default: 1000k)

SORT= Sort allocation in terms of cylinders.
(default: SORTCYL definition in the JCLDEF member of prefix.MICS.PARMS)

SYSPARM= Facility to enable the user to specify a SAS SYSPARM value.
(default: null)

```
WORK=       SAS WORK file allocation in terms of tracks.
            (default:  '500,250')
```

An example of option specification with the batch procedure is shown below:

```
//STEP1  EXEC MICSSHRx,RSYSOUT=C,RSIZE=500K
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```

4.2 Multiple Database Access (MICSCOM)

The MICSCOM procedure provides read-only batch access to one or more database units in a database complex.

To use this procedure, you must define which of the unit databases is to be accessed. This is done by providing the prefixes of the database units in a set of execution parameters named PFX1 through PFX10. For example, to access two databases with the prefixes DB2.PRIM and DB2.TEST, the EXEC statement would be:

```
//   EXEC MICSCOM,
//        PFX1='DB2.PRIM',
//        PFX2='DB2.TEST'
```

MICSCOM will allocate the databases for each unit named, up to a maximum of 10 units.

To access the files provided by MICSCOM, you should use the MICS macro variables that define the DDnames for each database unit. These macro variables can be used in your SAS program to provide the correct DDname for each information area in each timespan and database unit. The macro variable names have the form &diiit, where "d" is the database unit identifier, "iii" is an information area (e.g., HAR), and "t" is a timespan (e.g., X for the DETAIL timespan). For example, the macro variables for the Hardware Utilization Information Area in a Unit with an identifier of A would be:

```
&AHARX - Defines DETAIL timespan DDname
&AHARD - Defines DAYS   timespan DDname
&AHARW - Defines WEEKS  timespan DDname
&AHARM - Defines MONTHS timespan DDname
&AHARY - Defines YEARS  timespan DDname
```

To use the most recent cycle of the HARPCA file in the DAYS timespan, you could have the following statement in your program:

```
SET &AHARD..HARPCA01;
```

Note: You must use a special form of the DDname macro variable for units having a numeric unit ID. For numeric units, the macro variable is &_niiit, where n is the database unit identifier (0-9). For example, the DAYS timespan Hardware Information Area in the "5" unit is &_5HARD. You would access the most recent cycle of the DAYS HARPCA file as follows:

```
SET &_5HARD..HARPCA01;
```

The following options are provided with the MICSCOM batch procedure:

PFXx=	where x may be 1 through 10. Prefixes of the unit databases that you want to access.
LSYSOUT=	SYSOUT class used for SAS log reports. (default: LOGS definition in the JCLDEF member of prefix.MICS.PARMS)
OPTIONS=	Facility to enable the user to specify any of the SAS Facility options, such as line size. (default: null)
RSYSOUT=	SYSOUT class used for standard reports. (default: REPORTS definition in the JCLDEF member of prefix.MICS.PARMS)
RSIZE=	Region size for the step. (default:1000k)
SORT=	Sort allocation in terms of cylinders. (default: SORTCYL definition in the JCLDEF member of prefix.MICS.PARMS)
SYSPARM=	Facility to enable the user to specify a SAS SYSPARM value. (default: null)
WORK=	SAS WORK file allocation in terms of tracks. (default: '500,250')

An example of option specification with the batch procedure is shown below:

```
//STEP1  EXEC MICSCOM,RSYSOUT=C,RSIZE=500K,PFX1='DB2.PRIM'
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```

4.3 Single Database Update (MICSDBx)

The MICSDBx procedure provides read/write access to one database unit. It contains definitions for the SAS libraries, sort libraries, and the CA MICS system libraries. There is one MICSDBx procedure for each database unit in the database complex. They are all named MICSDBx, where "x" is the database ID defined on the DATABASE statement in prefix.MICS.PARMS(JCLDEF).

The MICSDBx procedure, stored in the installation PROCLIB, is executed in a standard batch job as shown below:

```
//STEP1 EXEC MICSDBx
```

The only requirement is for the user to specify the SAS program that is to be executed, and that is done by defining the SYSIN DD statement.

```
//STEP1  EXEC MICSDBx
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```

The following options are provided with the MICSDBx batch procedure:

```
LSYSOUT=    SYSOUT class used for SAS log reports.
            (default: LOGS definition in the JCLDEF
            member of prefix.MICS.PARMS)

OPTIONS=    Facility to enable the user to specify any of
            the SAS PARM options, such as line size, etc.
            (default: null)

RSYSOUT=    SYSOUT class used for standard reports.
            (default: REPORTS definition in the JCLDEF
            member of prefix.MICS.PARMS)

RSIZE=      Region size for the step.
            (default: 1000k )

SORT=       Sort allocation in terms of cylinders.
            (default: SORTCYL definition in the JCLDEF
            member of prefix.MICS.PARMS)

SYSPARM=    Facility to enable the user to specify a SAS
            SYSPARM value.
            (default: null)
```

```
WORK=       SAS WORK file allocation in terms of tracks.
            (default: '500,250')

An example of option specification with the batch procedure
is shown below:

//STEP1  EXEC MICSDBx,RSYSOUT=C,RSIZE=500K
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```

4.4 CA MICS/SAS Access (MICSNDBx)

The MICSNDBx procedure provides batch access to SAS with definitions for the SAS libraries, sort libraries, and the CA MICS system libraries. There is one MICSNDBx procedure for each Database Unit in the Database Complex. They are all named MICSNDBx, where "x" is the database ID defined on the DATABASE statement in prefix.MICS.PARMS(JCLDEF).

The MICSNDBx procedure, stored in the installation PROCLIB, is executed in a standard batch job as shown below:

```
//STEP1 EXEC MICSNDBx
```

The only requirement is for the user to specify the SAS program that is to be executed and that is done by defining the SYSIN DD statement.

```
//STEP1  EXEC MICSNDBx
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```

The following options are provided with the MICSNBDx batch procedure:

```
LSYSOUT=    SYSOUT class used for SAS log reports.
            (default: LOGS definition in the JCLDEF
            member of prefix.MICS.PARMS)

OPTIONS=    Facility to enable the user to specify any of
            the SAS PARM options, such as line size, etc.
            (default: null)
```

```
RSYSOUT=    SYSOUT class used for standard reports.
            (default: REPORTS definition in the JCLDEF
            member of prefix.MICS.PARMS)

RSIZE=      Region size for the step.
            (default: 1000k )

SORT=       Sort allocation in terms of cylinders.
            (default: SORTCYL definition in the JCLDEF
            member of prefix.MICS.PARMS)

SYSPARM=    Facility to enable the user to specify a SAS
            SYSPARM value.
            (default: null)

WORK=       SAS WORK file allocation in terms of tracks.
            (default: '500,250')
```

An example of option specification with the batch procedure is shown below:

```
//STEP1  EXEC MICSNDBx,RSYSOUT=C,RSIZE=500K
//SYSIN  DD   DSN=prefix.MICS.USER.SOURCE(program),
//            DISP=SHR
```