Operating System Environment Manager

For z/OS

User's Guide

Version 6.1

SC31-6901-01

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What's New

Version 6.1 (FMID HOSM610)

The following enhancements have been made to OS/EM version 6.1:

- OS/EM 6.1 provides support for z/OS 1.7.
- OS/EM 6.1 introduces new three byte prefixes for all OS/EM load modules, ISPF resources (panels, skeletons, tables), REXX procedures, messages, etc. The old prefix **OS$** is replaced by **FEM**. For load modules that support ESA/390 architecture (i.e. 31-bit addressing), the prefix **OS@** is replaced by **FEN**.
- The user now has the ability to send messages to the operator console whenever OS/EM processes Job Routing JECL statements or automatically assigns Job Routing resources.
- OS/EM ISPF Dialog Security restricts access to administration ISPF panels by functional group and/or individual function. This security is controlled through profiles defined to external security.
- Job Routing & Classing rules now allow jobs to be filtered based on a PDS member name (or member name mask) specified in DD JCL statements.
- The RACF Restricted Password Control feature now supports mixed-case passwords (this requires z/OS 1.7 or later).
- New ISPF functions for OS/EM maintenance functions:

  Assemble JES offset tables
  Copy SMP/E target libraries to executable libraries
  Modify installation variables
  Review/change OS/EM DSNames
  SMP/E functions for OS/EM maintenance users to specify the external security resource class and profile names for JCL & SYSOUT parameter checking (JCL Controls).
- PTFs UK00501 & UK00502 provide support for z/OS 1.8
- PTFs UK00620 & UK00622 provide enhanced functionality to allow users to specify the external security class and resource names for JCL & SYSOUT parameters controlled in the JCL Controls functions.
- PTFs UK00627 & UK00628 provide support for z/OS 1.9
- PTFs UK00664 provides support for the new IEFU29L user exit functionality (i.e. SMF Dump Controls) that is introduced with z/OS 1.9.

Version 6.0 (FMID HOSM600)

The following enhancements have been made to OS/EM version 6.0:

- OS/EM now supports z/OS 1.6

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- The **OS/EM Autoinstall Feature** (new for version 6.0) significantly simplifies the OS/EM product installation process. See the **Basic Exit Functions** of the OS/EM User Guide for more information about this feature.
- Job Routing now supports up to 127 route statements.
- Job Routing now supports up to 127 dependent job control statements.
- Job Routing now supports up to 127 CNTL statements.
- The Job Routing communications dataset's record size has been increased to a maximum of 32719 from 4504 to allow additional resource entries.
- Job Routing has been enhanced to allow routing by:
    - PDS member name
    - Source name
    - Source program name
    - Source type
    - WLM Scheduling Environment
- OS/EM internals have been modified to enhance performance.
- Notification of User and OS/EM abends has been enhanced.

  You may now specify up to three IDs to be notified in the case of a user exit abend. You may also create notification groups where each ID within the group will receive a TSO send message.

  You may optionally specify a user ID or notify group name for each major section of OS/EM, i.e. ALLOCATION, SMF, HSM, etc.
- Performance Counts and Timings have been added to the Query Report.
- All load modules referenced in a Query Report now includes the name of the load library where the module was located.
- OS/EM now supports up to 255 user exits per supported exit point.
- OS/EM can optionally prevent a job from starting until all required datasets are available.
- OS/EM can optionally limit the concurrent execution of selected programs.
- OS/EM can issue DFSMSHSM Recall commands at conversion time and optionally prevent execution until needed files have been recalled.
- OS/EM can automatically execute a JCL procedure when an SMF log dataset has been closed. This obsoletes a site's IEFU29 user exit.
- Dynamic task library utility - **OS$LIB**. This TSO utility allows users to dynamically define, modify and delete library DD's (e.g. STEPLIB, SYSPROC).
- The OS/EM RACF password validation function provides the ability to apply standards when users select a password.
- The Force Open Controls function provides improved DASD space management by releasing space allocated to datasets that are not opened. An OPEN is issued for any new dataset that is allocated by a job but is not opened. Filtering facilities allow this function to control the datasets that are processed by this function.
- The TMSACCT option has been removed from version 6.0.

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- The ENHANCED $HASP165 message option has been removed from version 6.0.

Version 5.6

The following enhancements have been made to OS/EM version 5.6:

- OS/EM now supports z/OS 1.6
- A **PRIMARY JES** indicator has been added to the **Set JES Name** function in the ISPF interface as well as the Query Report.
- OS/EM can now convert EZ-Proclib(R) statements to JCLLIB statements.
- SYSOUT Extension Support for JES2 Parameters
    - You may now control SYSOUT extensions based on the JES2 Initialization parameters ESTLNCT, ESTPAGE and ESTBYTE. See Job Controls in the User Guide.
- Job/Step Statistics

  The STEPENDWTO message has been enhanced to show the CPU time and I/O counts. This is an optional feature and the original message is still available for customers using an automation package to trap the message.
- Job Routing Changes
    - OS/EM now supports 999 selection groups.
    - SMF Records are now cut for jobs having resources attached to them.

      A record number must be assigned to OS/EM for this function to become active. See “SMF Recording” on page 3-6 for instructions on assigning a record number.
    - Jobs may now be routed based on the account number field.
    - Jobs may be routed by the time parameter on the job card.
    - A Default Resource option has been added.

      Any job which does not have a resource attached to it will receive this new default resource.
    - Convert SCHENV JOBCARD parameter to OS/EM Route

      OS/EM can scan for the keyword SCHENV= on the JOBCARD statement and remove it. It then inserts an OS/EM Job routing JECL statement using the scheduling environment name just removed as the resource name.
    - Convert SYSAFF=name to SYSAFF=ANY if OS/EM Route present

      OS/EM can set a job's system affinity (SYSAFF) to ANY, if, and only if, the job has been assigned one or more OS/EM Job Route resources. The job route resources may be from either JECL control cards (/*ROUTE resource) or automatically generated.
    - OS/EM will now route a job or range of jobs to another node if the job has the named resource attached to it. See Appendix F for the command format.
    - The $DC (display conflicts) command has been enhanced to show jobs coming from a system without OS/EM job routing active, and to flag jobs which have a multi-system resource conflict.
- Region Controls now supports the MEMLIMIT keyword.

  OS/EM can now control the amount of storage given to a job above the 2 gigabyte bar. You may specify anything between zero for nothing above the bar to a maximum of 16 exabytes.

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See option 7 on the JCL Controls Menu.

- The HSM Optimizer Priority Controls now supports failing requests based on the source of the request, location of data or dataset name/masks.

  See option 8 on the HSM Optimizer Menu.

- The OS/EM RACF area now controls access to external tapes.

  OS/EM will allow a user to read any tape dataset with the following criteria is met, thus bypassing the RACF PROTECALL(FAIL) option:

  - A RACF profile does not exist for the dataset.
  - The user has READ access authority or higher to the FACILITY class profile EXTERNAL.TAPE.

Version 5.5

The following enhancements have been made to OS/EM version 5.5:

- ISPF Exit 16
  - Static System Symbolics may be used to generate file names for the ISPF Log dataset, List dataset and work datasets.
- JES2 Exit 5
  - Job Resource Routing (formally the Mellon Modifications) has been enhanced to allow automatic routing of jobs based on:
    1. DDNAME
    2. Dataset Name
    3. Job Class
    4. Job Name
    5. Program Name
    6. RACF Group
    7. Unit Name
    8. TSO User ID
    9. Workload Manager Service Class
    10. Execution Parm value
  - Set JOBCLASS based on:
    1. DDNAME
    2. Dataset Name
    3. Job Class
    4. Job Name
    5. Program Name
    6. RACF Group

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7. Unit Name
8. TSO User ID
9. Workload Manager Service Class
10. Execution Parm value

- Set JES2 Job Priority based on:
  1. DDNAME
  2. Dataset Name
  3. Job Class
  4. Job Name
  5. Program Name
  6. RACF Group
  7. Unit Name
  8. TSO User ID
  9. Workload Manager Service Class
  10. Execution Parm value
- Set Service Class based on:
  1. DDNAME
  2. Dataset Name
  3. Job Class
  4. Job Name
  5. Program Name
  6. RACF Group
  7. Unit Name
  8. TSO User ID
  9. Workload Manager Service Class
  10. Execution Parm value
- Set Job Scheduling Environment (SCHENV=) based on:
  1. DDNAME
  2. Dataset Name
  3. Job Class
  4. Job Name
  5. Program Name
  6. RACF Group
  7. Unit Name

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8. TSO User ID
9. Workload Manager Service Class
10. Execution Parm value

- JES2 Exit 6
  - Account Number Controls now support up to six (6) accounting fields.
  - Account Number Controls may be limited to batch jobs, or both batch jobs and TSO users.
  - The Time Control function now allows jobs to be cancelled instead of having their time parameter adjusted.
- SMF IEFACTRT
  - A new function **Estimated Costs** has been added.

    The Estimated Cost function of OS/EM can be used to calculate an approximate charge for running each step of a job and an approximate total cost of running the job. The costs are presented in the "flower box" produced by requesting OS/EM's STEP/JOB-end statistics.
- SMF IEFUSI
  - Region Control values for region size below the line and limit value below the line may be specified as a negative value. This means that the job will be given all available space minus the value specified.
  - A new function **Quick Delete** has been added.

    This function specifies that any files coded with a retention setting of DELETE and the program name is IEFBR14 will be deleted by OS/EM. No DFSMSHSM RECALL will be performed. Instead a HDELETE will be generated.
- SMF IEFU83
  - A new function **Catalog Account Controls** has been added.

    This function can be used to place up to 32 bytes of JOB or STEP accounting information into the catalog record for a newly created VSAM dataset or SMS-managed non-VSAM dataset. Additionally, the JOB's User ID is placed into the Owner field of the catalog record. Neither of these fields is overridden if the information has already been provided.
- MISC Controls ACF2 Non-cancel Override
  - It is now possible to override the ACF2 non-cancel user attribute to allow OS/EM to enforce its controls.

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Introduction to OS/EM

What is OS/EM?

OS/EM (Operating System/Environment Manager) is a dynamic exit manager and a set of optional, standard control exits for the OS/390 and z/OS environments. As a dynamic exit manager, it provides a consistent, easy-to-use interface to most exit points provided by IBM to enhance the OS/390 and z/OS environment.

The Extended OS/EM Functions provide most options commonly included in exits written by Systems Programmers, without the overhead associated with developing, maintaining, testing and implementing those exits. The ISPF interface also allows the changing of Extended OS/EM Functions without an IPL.

Extended OS/EM Functions

OS/EM can supply functions that incorporate many of the features which user exits are commonly intended. In many cases, the Extended Functions will provide all of the services required by your installation without any coding.

Where applicable, the exits have a WARN mode for the gradual introduction of the new functions.

These parameter-driven exits enable your installation to achieve:

- Optimization
- Maintainability
- Standardization
- Control

The benefits to this approach apply to installations new and old.

OS/EM The Operating System/Environment Manager

OS/EM provides your OS/390 or z/OS installation with:

- Greater system availability
- Isolated production testing
- Operating System standardization
- Ease of maintenance

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System availability

With the ever-increasing size of host networks and seven-day, 24-hour service requirements, availability has become the keyword as far as both users and the operating system support staff is concerned. Your installation needs the system to function to carry on the business of the business, and your support staff needs the system to install program products, "tune" resource control functions, apply maintenance, etc.

OS/EM allows your system staff to install any product or user-written control function that uses an OS/390 or z/OS SMF, TSO, JES2, JES3, RACF, HSM, DADSM or allocation exit without requiring an IPL.

- This can be extremely useful when doing recovery on another processor since no IPL is needed to start your version of the environment.

Isolated production testing

OS/EM enhances system reliability by allowing your systems staff to thoroughly test new exits in the same production environment in which they will be running. A standard OS/EM function is to remove any exit which abends, thereby allowing normal production work to proceed. This allows the systems staff to do more thorough testing because the testing process will not have a negative impact on your system's integrity.

Another standard OS/EM function is to limit, by jobname, the scope of SMF, TSO, RACF, DADSM, and some JES2/JES3 exits. This facility will allow the testing of new exits without impacting the function of existing exits.

Operating system standardization

OS/EM allows your installation to have a standard operating environment, whether on a single processor or multiple processors, by allowing all exit modules to exist outside of the operating system. Trying to stay vanilla is the very reason OS/EM was developed; you can now have the controls/products you need while still keeping a vanilla operating system without reliability exposure, availability interruptions, or system modification problems. Variations from the standard IBM supplied OS/390 or z/OS environments, such as those supplied by program products or user-written control functions, no longer require an IPL or system modification (SMP/E). Loading or reloading any of these exits can now be done via a TSO command (or ISPF dialogue).

- Combining OS/EM and its associated Extended functions with an IBM OS/390 or z/OS IPO results in an operating system environment that many installations take many months to obtain. The sample exits supplied with the IPO can easily be specified as user exits to OS/EM, or the Extended OS/EM Functions can provide all the functions that the sample exits from the IPO provide plus much more.

Ease of maintenance

Since OS/EM manages the loading of exits, SMP/E is not needed to install exits into the operating system. While useful for any exit, this standard OS/EM function greatly simplifies the installation and maintenance of program products or user-written functions that need to share exits. OS/EM allows multiple exits sharing an exit point to exist independently; therefore SMP/E user modifications are not needed.

How OS/EM works

OS/EM replaces all IBM supplied SMF, TSO, JES2, JES3, RACF, ISPF, SAF, Allocation and HSM exits with its own control processor. This processor is installed at IPL time. OS/EM then dynamically loads and processes your installation's exits whether they are user-written, program products (job schedulers, report distribution systems, etc.), or OS/EM's optional control functions.

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At any time after the IPL you may:

- Alter the parameters by which OS/EM's optional control functions operate
- Reload an existing exit (presumably because it has been modified)
- Disable an exit
- Load an exit not previously installed

OS/EM has the ability to manage up to 255 modules per exit point. Using the Extended Functions does not restrict this number. However, stringing together multiple modules at a given exit point assumes that each module can work together. The functioning of an exit point may require that only one module can be "active", the other modules being "passive".

For example, TSO exit IKJEFF10 (the TSO SUBMIT exit) is normally used to alter or produce additional job statements. Multiple modules doing such would not seem prudent.

Supported exits

A list of currently supported exits is documented in “Appendix A. Supported Exits” on page A-1.

System components

The OS/EM system is comprised of the following five main components:

FEMIPL This program obtains storage for the OS/EM CVT (Communications Vector Table), which is required by the OS/EM control process. This program is run as part of the IPL process and uses the OS/390 or z/OS sub-system interface to establish the OS/EM environment.

FEMINIT This program is started at IPL time by the FEMIPL program. It attaches the TSO control program IKJEFT01 to process the initial FEMCNTL commands before JES2 starts.

FEMCNTL This program is the main program of process. It is a TSO command processor that checks the command function (the first operand on the command) and calls the appropriate modules to process the request. Before the FEMCNTL command can be used, the FEMIPL program must have been run to create the OS/EM environment.

Interface modules
These serve as the control facility to invoke the dynamically loaded exits that perform the actual exit functions.

Dynamic exits
These are the exits for your program products, in house coded exits, and OS/EM Extended Functions which are loaded by the FEMCNTL command processor.

OS/EM Messages Under TSO

In order to receive OS/EM message numbers under ISPF or TSO, the MSGID parameter in your TSO profile must be set on.

The following command may be issued to set OS/EM message numbers on, under ISPF or TSO.

```
TSO PROFILE MSGID
```

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ISPF Interface

The ISPF interface provides for the creation of the necessary OS/EM initialization parameters, and provides for the execution of OS/EM commands online. The interface has a function orientation. That is, the Extended OS/EM Functions are presented without regard to the OS/EM commands or exits that implement the function. The intent is to make OS/EM as accessible as possible.

ISPF Interface Description

The OS/EM Primary Option Menu provides for two major processing options. The 'Basic Exit Function' provides for the specification and management of all the OS/EM supported exit points. The Extended OS/EM Functions provides the support for DASD controls, QuickPool, JCL Controls, Job Controls, HSM Optimizer, HSM Reports, RACF Controls Device Restriction, ISPF File Prefix, Job Routing, Tape Share, SVC Delete/Replace Controls and Time Controls. Although initialization member generation and command generation bring the two processes together, the actual specification of basic and extended functions are independent of one another. The only requirement is that an exit point's OPTIONS be specified. The interface will ensure that this is true. This means that if your installation has no exits of its own, but you wish to use OS/EM Extended Functions, you will not have to be concerned with specifying basic functions.

The entries you make are saved from one use of the interface to the next. Each time you use the interface for a particular command, your last entries will be presented for any changes you wish to make.

- It is important to scan the presented information since you might build a new initialization member that contains parameters that you wished to be only temporary.

The interface saves all information in ISPF tables. This enables multiple users of the interface, each of who have access to the same information. However, only one user at a time may use the interface.

The required tables are not shipped with the OS/EM install package. They are generated the first time you invoke any of the interface functions. The amount of time required for this generation varies depending on your hardware and the work being done at the time of generation. Each time a particular function's tables are generated, a panel is presented indicating that tables are being generated. Some tables, such as volume and dataset name group tables, are generated only as required.

You may elect to generate the ISPF tables all at one time. To accomplish this, select option 1 from the OS/EM primary options menu.

Entering data

All OS/EM IPSF panels conform to standard display and data input conventions. Each panel has an ISPF command line at the top of the display (indicated by **COMMAND** ===>) and accepts the applicable ISPF commands.

The most commonly used ISPF commands are:

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- Parameter entry can be terminated at any time by entering the ISPF **END** (or **RETURN**) command. This is the normal method for signaling that you have finished your specifications. You will be returned to the next higher screen level.

- **CAN** or **CANCEL** in the command line will completely negate any entries you have made up to that point. The CANCEL command can only negate the last series of entries you have made. For example:

  You have specified GLOBAL ALLOW entries in the QuickPool function. Then you start specifying GLOBAL DISALLOW entries, change your mind and CANCEL. You have only canceled the DISALLOW entries, not the ALLOW entries you have already completed. If you have any doubts about what has been canceled, you should review your entries and make adjustments as necessary.

- The ENTER key will redisplay the current panel, along with any error messages that your entries may have generated.

Where necessary, panels contain "scrollable" areas that allow you to specify as many entries (such as volume and dataset name groups) as required by your installation. Panels with scrollable viewing are indicated by the presence of the **SCROLL** field in the top right hand corner of the panel. These panels support ISPF scrolling and location commands. The commands typically used are:

- The **MAX** (or **M**) command, when used in conjunction with PF7 / PF8 will position the display to the top / bottom of the entry list.

- The **L** command is used to position the display at a specific entry in the list based in the entry value. For example:

  L PROD will position the list to the entry with the value PROD. If there is no entry that exactly matches the value specified in the L command, the display will be positioned at the first entry that is alphabetically & numerically higher.

First use of the interface will present you with empty fields (of the appropriate type) which you modify. Additional entries are made by inserting new, blank fields; or by using an ADD command and overtyping existing information. Provision is made to allow you to delete entries that are no longer needed, while ensuring that information necessary to the successful operation of OS/EM is not deleted.

PF Key Usage

The Program Function (PF) keys supported by the OS/EM ISPF panels are:

PF1 Display HELP information
PF2 Split display screen at cursor
PF3 Return to previous menu (updates saved)
PF7 Scroll up
PF8 Scroll down
PF9 Swap display panels
PF12 Return to previous menu (updates discarded)

Specifying options and parameters

The bulk of a function's parameters/options are specified by entering either a YES or NO value, or leaving the option blank. Entering a YES will enable the option. Entering a NO will disable the option, etc. Once entered, each parameter and option will display with your last entry until you change it.

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Internal documentation

Where appropriate, you may enter descriptions that can serve as documentation. For example, each volume and dataset name group may have an optional description associated with it. You may use this description to describe the function of the group, document who created the group, etc. The description fields are provided strictly for your use and are included in the generated initialization commands for documentation.

Generated commands

All OS/EM commands are generated via ISPF skeleton processing. If an initialization member is requested, the final output is placed in the dataset pointed to by DD name FEMFILE which is automatically allocated when you enter the ISPF interface. If the command is issued online, the final output is executed via a TSO EXEC command.

- Specifying parameters via the ISPF Interface has no effect on OS/EM processing until you either build an initialization member or execute OS/EM's online function. Further, initialization members are only processed during OS/EM startup, they have no effect on current processing.
- Remember to ensure that procedure OSEM contains a SYSTSIN DD statement pointing to the correct dataset and that each initialization member is properly specified (for more information refer to the OS/EM Installation Guide).

The following initialization members are currently generated:

CODEINIT Contains the statements required to authorize the use of OS/EM, for the CPU ID, time period and options that your company has licensed.

Contains the SMF Recording Record Type number.

Contains Notification Group information.

Created when you select SYSTEM from the Build Initialization Members menu.

Note: The CODEINIT member must be the first member processed in the procedure OSEM SYSTSIN concatenation. No other OS/EM commands will be processed until this command is processed.

DASDINIT Contains the statements required to generate the DASD allocation controls.

Created when you select DASD from the Build Initialization Members menu.

DSNINIT Contains the statements required to generate your specified dataset name groups. If you have entered a description for a group, the description will appear as a comment before the group.

Created when you select Dataset from the Build Initialization Members menu.

HSMINIT Contains the statements required to generate the HSM Optimizer controls.

Created when you select HSM from the Build Initialization Members menu.

JCLINIT Contains the statements required to generate the JES2 JCL controls.

Created when you select JCL from the Build Initialization Members menu.

JES2INIT Contains the statements required to generate basic support for the various JES2 exits that you wish to load your routines.

Created when you select JES2 from the Build Initialization Members menu.

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JES3INIT Contains the statements required to generate basic support for the various JES3 exits that you wish to load your routines.

JOBINIT Contains the statements required to generate various Job related JCL controls.

Created when you select JOB from the Build Initialization Members menu.

JOBRINIT Contains the statements required to generate the Job Routing JES2 controls.

Created when you select JOBR from the Build Initialization Members menu.

MISCINIT Contains the statements required to generate the ACF2 Non-cancel Override Controls, Catalog Account Controls, Estimated Cost Controls, TSO Program Intercept Controls and the WTO Controls.

Created when you select MISC from the Build Initialization Members menu.

MVSINIT Contains the statements required to generate basic support for the various MVS exits that you wish to load your routines.

Created when you select MVS from the Build Initialization Members menu.

POOLINIT Contains the statements required to generate your specified global ALLOW and DISALLOW list; and the associations between volume pools and datasets explicitly ALLOWed or DISALLOWed on volumes within the pool.

Created when you select QuickPool from the Build Initialization Members menu.

PREFINIT Contains the statements required to generate the ISPF LOG/LIST/TEMP file prefix controls.

Created when you select PREFIX from the Build Initialization Members menu.

RACFINIT Contains the statements required to generate the RACF Discrete Profile controls.

Created when you select RACF from the Build Initialization Members menu.

RSTRINIT Contains the statements required to generate the Restrict Device controls.

Created when you select RSTR from the Build Initialization Members menu.

SVCINIT Contains the statements required to generate the SVC Delete/Replace controls.

Created when you select SVC from the Build Initialization Members menu.

TPSHINIT Contains the statements required to generate the TAPESHR controls.

Created when you select TPSHR from the Build Initialization Members menu.

TIMEINIT Contains the statements required to generate the Time Controls.

Created when you select TIME from the Build Initialization Members menu.

VOLINIT Contains the statements required to generate your specified volume groups. If you have entered a description for a group.

Created when you select Volume from the Build Initialization Members menu.

If you browse any of the initialization members, you will note that each exit point is generated as a separate OS/EM command. This is not an OS/EM requirement but it makes the commands easier to "read". Comments are included to help document what the command is for, and to document the user who last generated the command (along with date and time). If you use the description fields, they will be included as comments in the generated commands.

Do not EDIT the initialization commands. All maintenance of the initialization members should be done through the interface. Any changes you make by editing the member will not be included the next time

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you use the interface unless you have executed the OSEM started task and used the REBUILD command to resynchronize the interface.

Help Screens

An extensive set of HELP screens is supplied for the ISPF interface. These screens will guide you through the various fields on their "owning" panels and explain the use/contents of the fields.

Starting the ISPF Interface

The OS/EM ISPF Interface is reached either by selecting the OS/EM option from an existing ISPF Menu screen (assuming you created an OS/EM option on some existing ISPF Menu screen during the installation process), or by entering the command **FEMSTART** from the TSO READY prompt or ISPF Option 6 (TSO Command Processor).

Primary Options Menu

The Primary Option Menu (refer to Figure 1) presents several selections. Each option presents another selection menu, taking you down the path you have chosen.

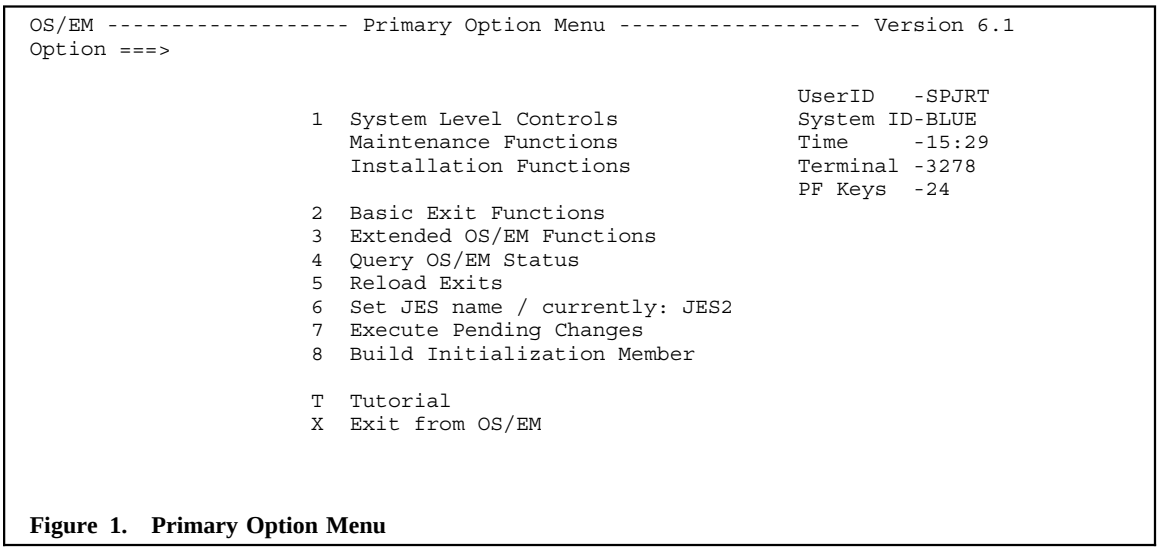

Figure 1. Primary Option Menu

Each of these paths is presented in the following sections:

1 System Level Controls (see “System Controls, Maintenance & Installation Functions” on page 3-1)

2 Basic Exit Functions (see “Basic Exit Functions” on page 4-1)

3 Extended OS/EM Functions (see “Extended OS/EM Functions” on page 5-1)

4 Query OS/EM Status (see “Query OS/EM Status” on page 6-1)

5 Reload Exits (see “Reload Exits” on page 7-1)

6 Set JES2 name (see “Set JES2 Name” on page 8-1)

7 Execute Pending Changes (see “Execute Pending Changes” on page 9-1)

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8 Build Initialization Member (see “Build Initialization Member” on page 10-1)

T ISPF Tutorial

X Exit OS/EM

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System Controls, Maintenance & Installation Functions

This menu is divided into three sections:

1. System Level Controls - defines general OS/EM system parameters
2. Maintenance - OS/EM housekeeping functions
3. Installation - OS/EM installation & upgrade functions

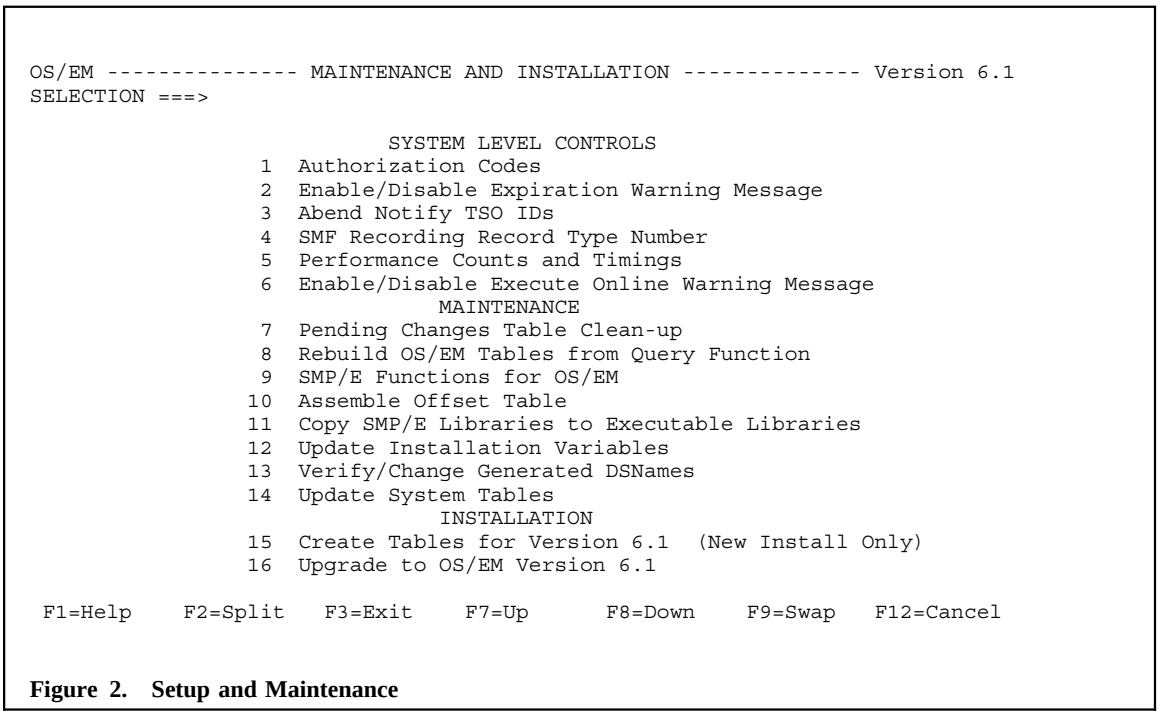

Figure 2. Setup and Maintenance

Enter the **number** for the function that needs to be performed. The appropriate panel will then be displayed.

Each of these paths is presented in the following sections:

System Level Controls
See “System Level Controls” on page 3-2

Maintenance
See “Maintenance” on page 3-8

Installation
See “Installation” on page 3-23

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System Level Controls

Authorization Codes

The Authorization Codes function is used to authorize OS/EM to execute on your installation's CPU(s).

```
OS/EM -------------------------- AUTHORIZATION CODES ------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


 Line Cmds: (A)dd new code, (D)elete existing code, (S)elect for update

      Authorization
  Sel      Code              Description
   _    3CF8BB8233           Blue System_________________________

   _    2F83A6F119           Disaster Recovery Site______________

   _    3D66C1E203           Green System________________________

****************************** Bottom of data ********************************
```

Figure 3. Authorization Codes

Enter the **Authorization Code** supplied with your installation materials.

When your order for OS/EM was placed, you were asked for the four low-order digits of the CPUID you will be running on. Therefore you need supply only one CPUID if your CPU contains more than one processor.

Each CPU that you intend running OS/EM on must have an authorization code. Multiple authorization codes are allowed in the initialization member so that a single initialization member can be used for all the CPUs at your site.

Note: You may also want to add authorization codes for your disaster recovery site so that there will be no problems if you have to execute offsite.

There are 3 line commands available:

A Add a new code.

Enter 'A' in the SEL column and overtype any existing information and press enter.

D Delete an existing code.

Enter 'D' in the SEL column to delete an entry no longer needed.

S Select an existing code to update the description.

Enter 'S' in the SEL column to update the description field. The authorization code itself may not be updated. If an incorrect code is entered, you will need to re-add it as a new code, then delete the incorrect code.

Usage Notes :

- If no authorization codes are defined, an attempt to build the System Level Controls initialization parameters will fail (see “Build Initialization Member” on page 10-1).

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Expire Warning Messages

Warning messages will be issued starting 30 days before expiration of the authorization code. You will need to obtain a new code within that time.

By default OS/EM will produce the message **FEMDCN031 *WARNING* OS/EM WILL EXPIRE IN xx DAYS** every hour for the entire month before expiration.

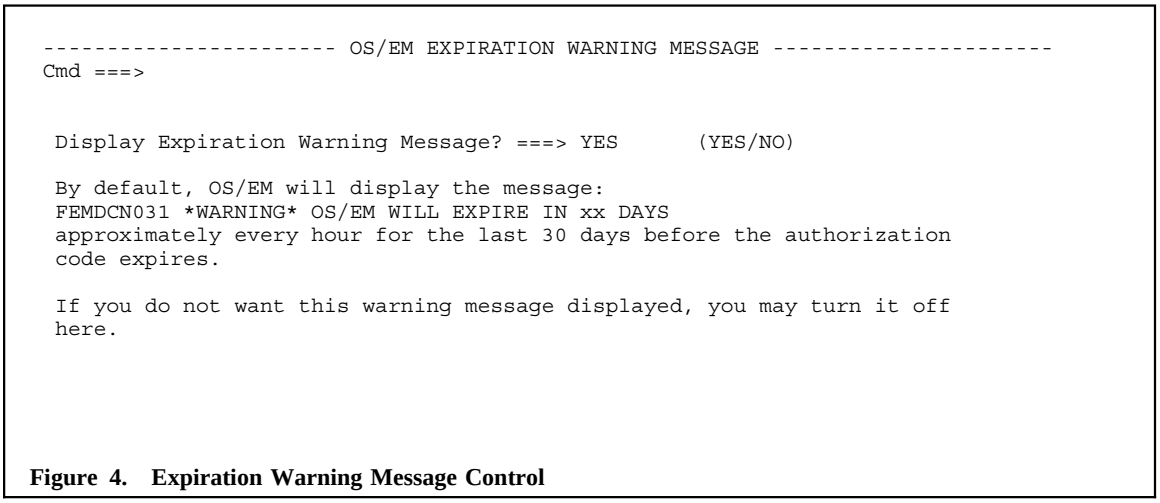

Figure 4. Expiration Warning Message Control

Some customers have found this to be distracting and have requested a way to turn off the warning message. This function will allow you to suppress the message.

Note: Suppressing this message may be unwise as OS/EM will fail to operate once your current authorization code has expired.

Abend Notification

This function defines the TSO users who are to be notified in the event of an ABEND.

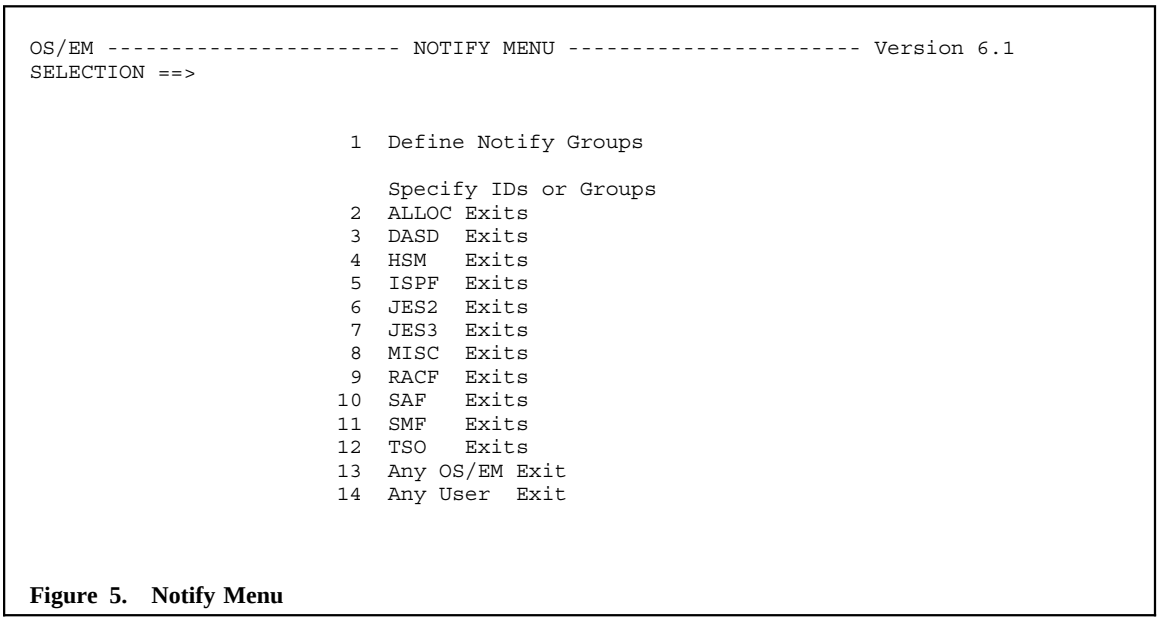

Figure 5. Notify Menu

TSO user IDs can be defined explicitly to one or more exit functions and/or to one or more user groups which are subsequently defined to the desired exit functions.

Each exit function can have a maximum of three user definitions. Therefore, it is often recommended that user groups be used.

Selection Options:

1 Define & maintain notification user groups.

2-12 Define users/groups to receive ABEND notification for specific user exit functional areas.

13 Define users/groups to receive ABEND notification for **any** OS/EM exit.

14 Defines users/groups to receive ABEND notification for **any** user exit.

Options 2 through 14 have the same selection panel and so will not be described individually.

Define Notify Groups

This function provides the ability to group multiple users into a single logical entity that can be used for ABEND notification. Up to 32 user groups can be defined.

When this function is entered, the list of group names is displayed. **PF7 / PF8** scrolls backwards/forwards through the group list.

```
OS/EM ---------------------- NOTIFY GROUPS ---------------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR


  Line Commands:  (S)elect for Update

 Cmd  Group Name   Description
  s    SYSPROG_  : Systems Programmers_____________________________

  _    PAYROLL__  : Payroll Application Group_____________________

  _    GL_______  : General Ledger Application Group_______________

  _    _________  : ___________________________________________________

  _    _________  : ___________________________________________________

  _    _________  : ___________________________________________________

  _    _________  : ___________________________________________________

  _    _________  : ___________________________________________________
```

Figure 6. Define User Groups Menu

The **S** line command selects the entry to be defined or altered. The group name and description fields can be entered or modified (Caution: altering the group name may have adverse effects on existing abend notification lists).

When **Enter** is pressed, the following entry box will be displayed:

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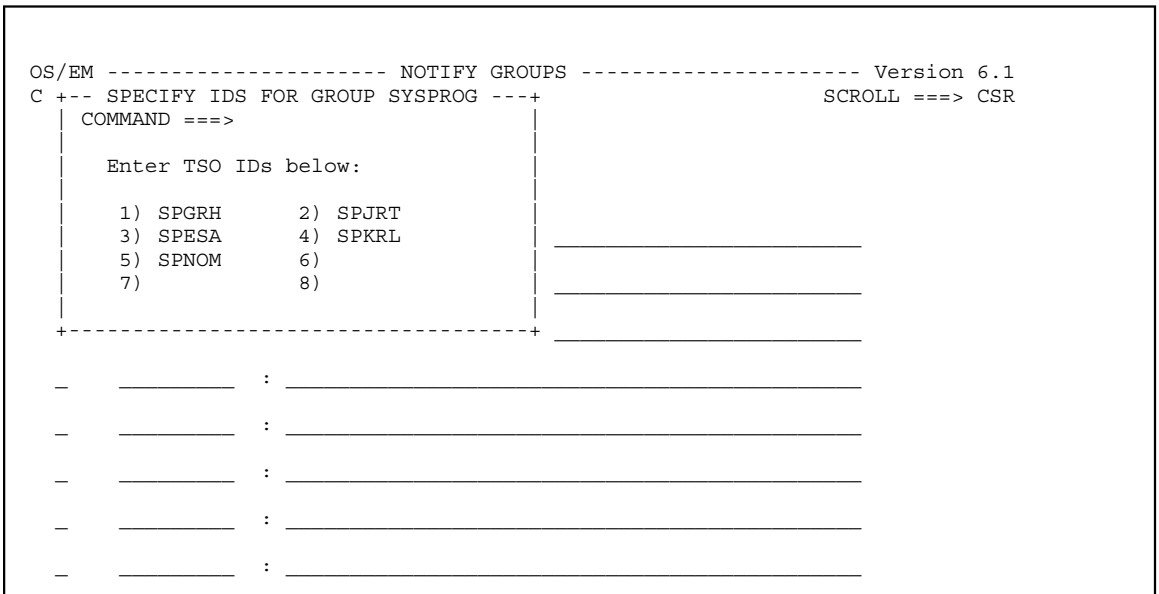

Figure 7. Define User IDs for a Group

Enter the user name(s) in the available fields (1 through 8). **PF3** completes the user name definition and returns to the user group list panel.

User Notes:

- OS/EM supports up to 32 TSO user ID groups
- Each user group can have up to 8 TSO ID definitions.

Define Users for Abend Notification

Options 2 through 12 of the Notify Menu panel maintains the notification lists for user exit abends. When any of these options is selected, the following panel is displayed:

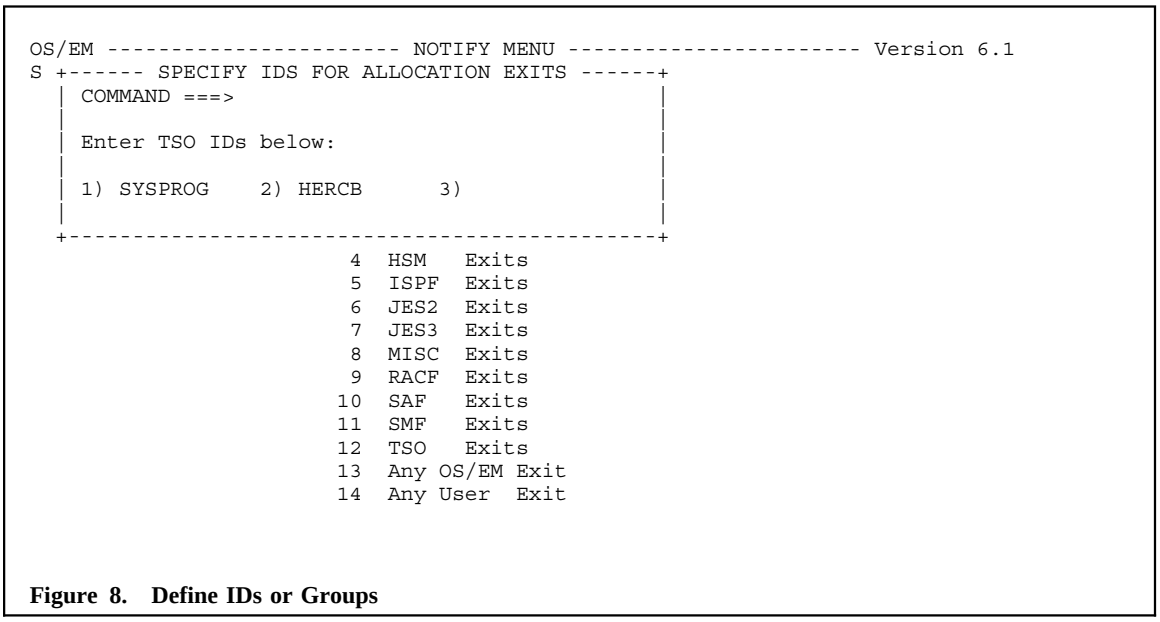

Figure 8. Define IDs or Groups

Enter the TSO user IDs and/or user groups to be notified of an abend. **PF3** completes the update process and the user is returned to the Notify Menu.

SMF Recording

OS/EM can create SMF records to track each execution of the **FEMCNTL** command and its output. Job Routing changes also create SMF records.

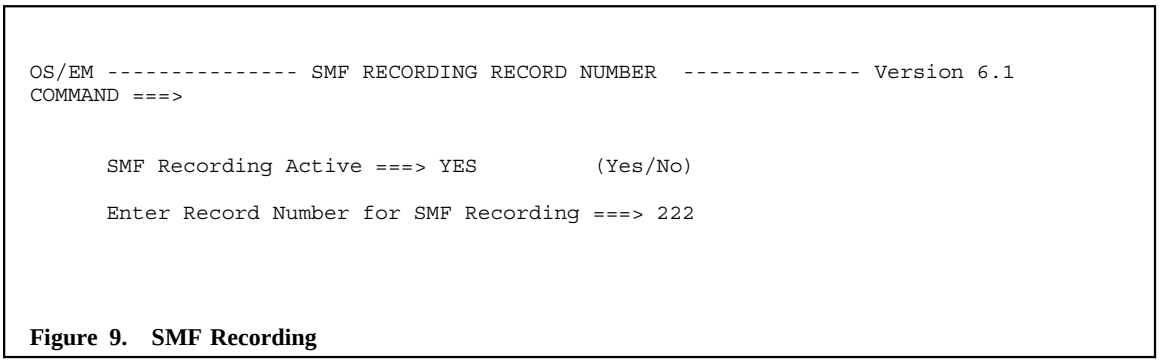

Figure 9. SMF Recording

Field entry is as follows:

1. SMF Recording Active

   Enter **Yes** or **No** to control the creation of the OS/EM SMF records.

2. Enter Record Number for SMF Recording

   Enter the number of the record type you want OS/EM to use.

   Note: This number may also be specified in the OSEM subsystem definition in the system PARMLIB. Be sure that it is the same number if it is specified in both places. Refer to the OS/EM Installation Guide for more information.

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Performance Counts and Timings

OS/EM can track the number of times an exit is called and the CPU time each exit took to execute. These values are displayed on the OS/EM Query Report. Because tracking these values adds overhead to your system, it is suggested that you normally leave this tracking function disabled.

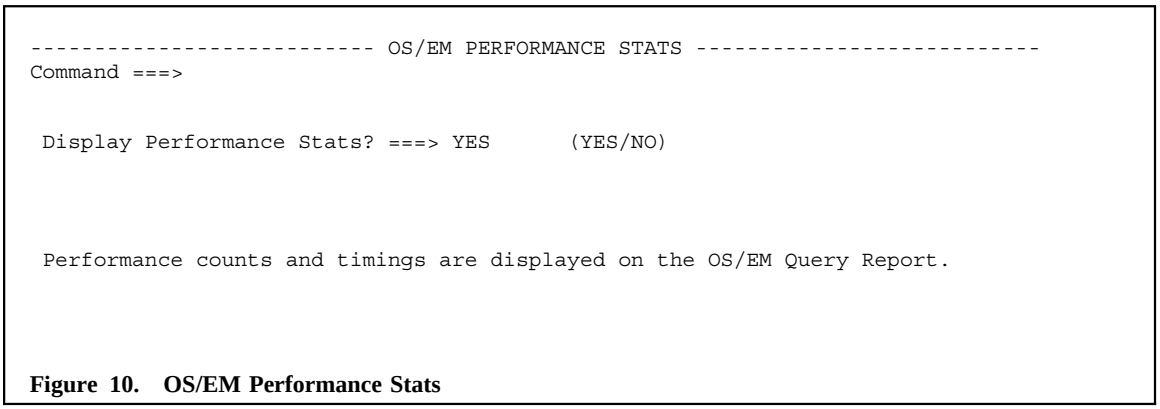

Figure 10. OS/EM Performance Stats

Enter **YES** to enable performance tracking, enter **NO** to disable tracking.

Execute Online Warning Message

The OS/EM ISPF interface allows you to execute online (or via batch) the changes you have made to the different options. To make the changes effective across IPLs, the INIT members have to be updated.

To remind you of this needed function, a warning pop-up window is displayed each time you execute the changes.

You may disable this message with the **WARN** System Level Control.

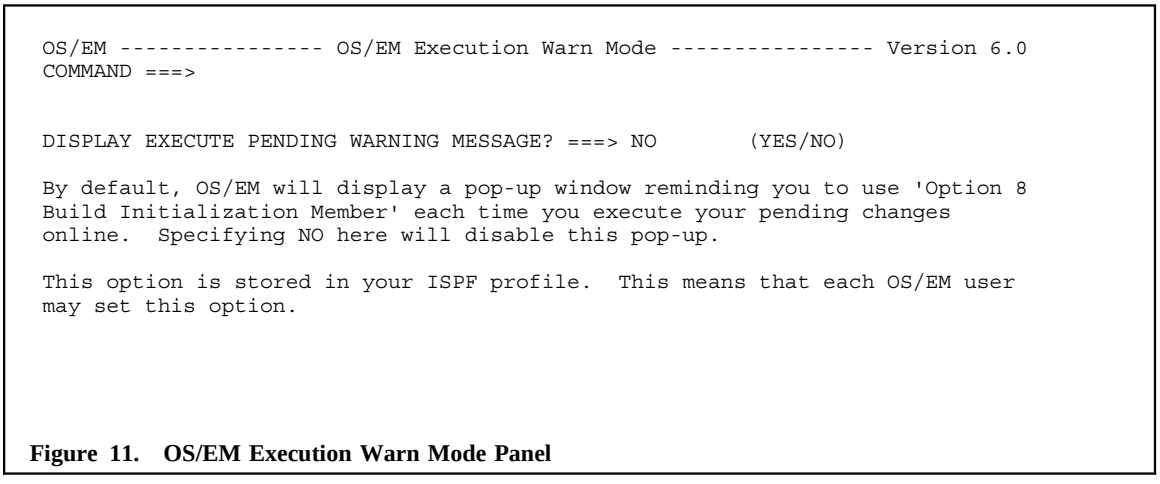

Figure 11. OS/EM Execution Warn Mode Panel

Enter **NO** to turn off the warning pop-up. Enter **YES** to keep the pop-up reminder.

Note: This setting is stored in the individual users ISPF profile dataset. As such this setting applies to the individual OS/EM user.

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Maintenance

This section provides functions to maintain the OS/EM environment.

Pending Changes Table Maintenance

The Pending Changes Maintenance function is used to clean up the Pending Changes table by deleting changes that have been permanently implemented by having the initialization members built (see “Build Initialization Member” on page 10-1).

This function is particularly useful when frequent changes are being made to OS/EM (e.g. initial setup and tuning) because it reduces the amount of data in the table (all changes to the OS/EM system are recorded in the Pending Changes table).

Note:

1. If the Pending Changes table library is a standard PDS, periodic compression of the dataset will be necessary.
2. The Rebuild Function will automatically delete all Pending Changes entries (See "Rebuild OS/EM Tables" in this topic)

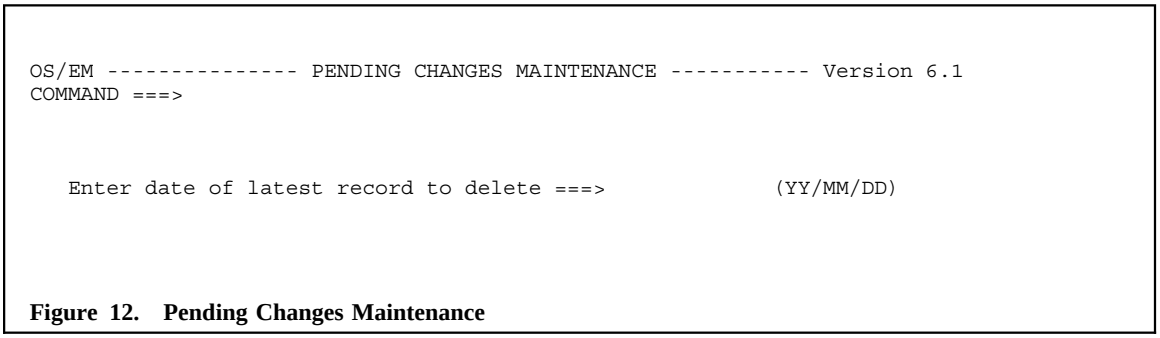

Figure 12. Pending Changes Maintenance

Field entry is as follows:

1. Enter the **date** in YY/MM/DD format, of the latest changes to delete.
2. Press **Enter** to begin the deletion process, or **PF3** (end) to exit.

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Rebuild OS/EM Tables

The Rebuild Function reconstructs the ISPF tables from the current OS/EM system environment.

The function processes an OS/EM Query (by either executing the Query command or reading a previously saved query) and recreates the ISPF tables. Any descriptions which have been previously entered will be copied from the original ISPF tables before they are deleted.

The Rebuild Function can be used to synchronize the tables with the existing environment after OS/EM changes are made without going through the ISPF interface.

Note: If you have valid changes pending, they should be executed prior to using this function, or those changes will be lost. See "Execute Pending Changes" on page 9-1 for more information on this process.

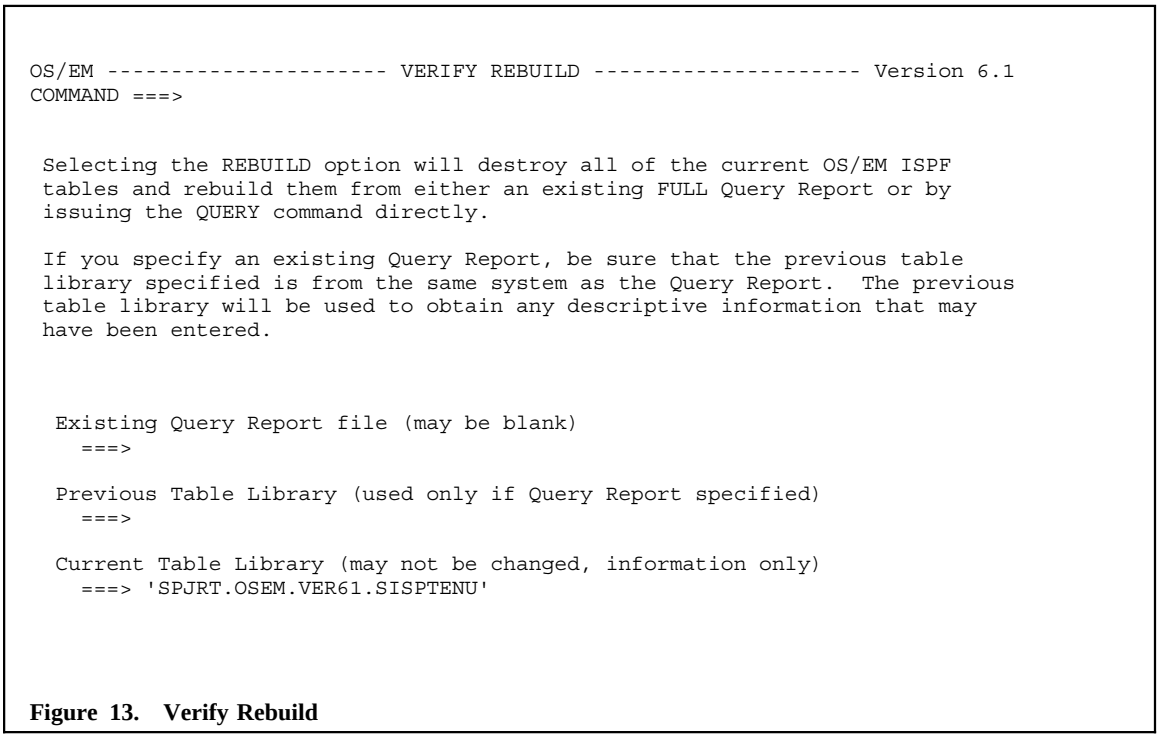

Figure 13. Verify Rebuild

Field entry is as follows:

1. Enter an existing **Query Report** which will be used in place of executing the query command directly (optional).

   If used, be sure to enclose the DSN in apostrophes (single quotes), otherwise your TSO ID will be appended to the front of the dataset name.

2. If you entered a Query Report DSN, you must also enter the name of the matching table library. If this library is not on shared DASD, make a temporary copy available on the system which will execute the rebuild function.

   Again, use apostrophes to qualify the dataset name.

3. Press **ENTER** to destroy all existing OS/EM ISPF tables and rebuild them based on current storage.

4. Press **PF3** (END) to cancel.

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```
OS/EM ------------------ ISPF TABLE REBUILD UTILITY ------------- Version 6.1
COMMAND ===>


   PLEASE WAIT. . . . . .

   The OS/EM tables are being rebuilt.

   Generating function:  BASIC

   Depending on the options you have chosen, this process may take some
   time.

   Currently processing member:  FEMTBUJY
```

Figure 14. ISPF Table Rebuild Utility

Since this process takes several minutes to complete, the above panel is displayed to let you know what processing is currently being done.

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SMP/E Functions for OS/EM

The SMP/E Functions provide dialogs for applying maintenance to the OS/EM product. This is a simplified form of the standard SMP/E ISPF dialog for the RECEIVE, APPLY and ACCEPT functions.

It is not mandatory to use these functions to apply OS/EM maintenance (users can use the SMP/E dialogs and/or tailored JCL). However, these dialogs significantly streamline the maintenance process and insure that the correct datasets are used.

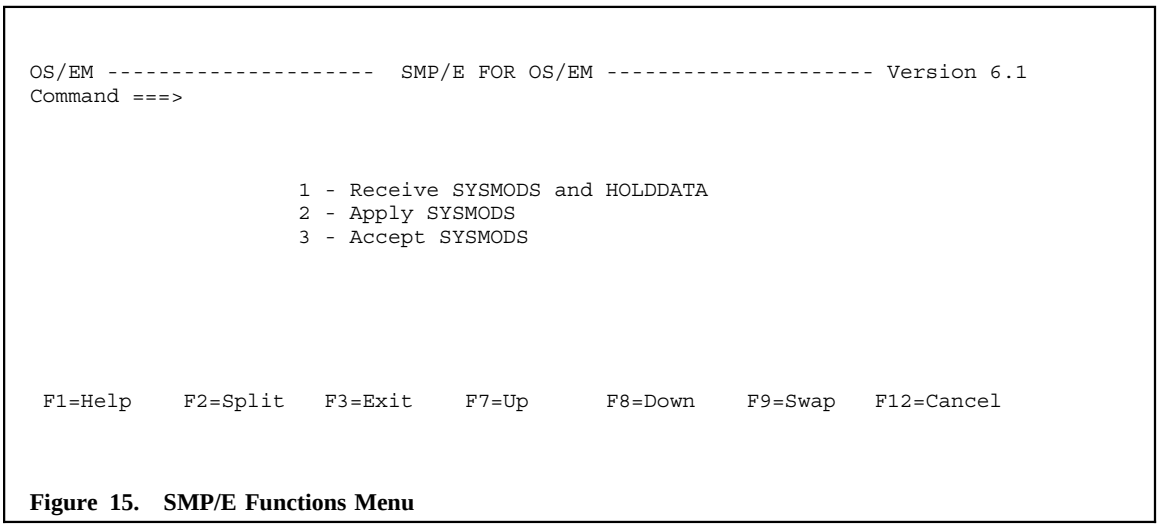

Figure 15. SMP/E Functions Menu

Each option will submit a job to complete the SMP/E function. A JOB statement skeleton panel will be presented which will allow the user to tailor the JOB statement, view / edit the JCL stream and submit the job.

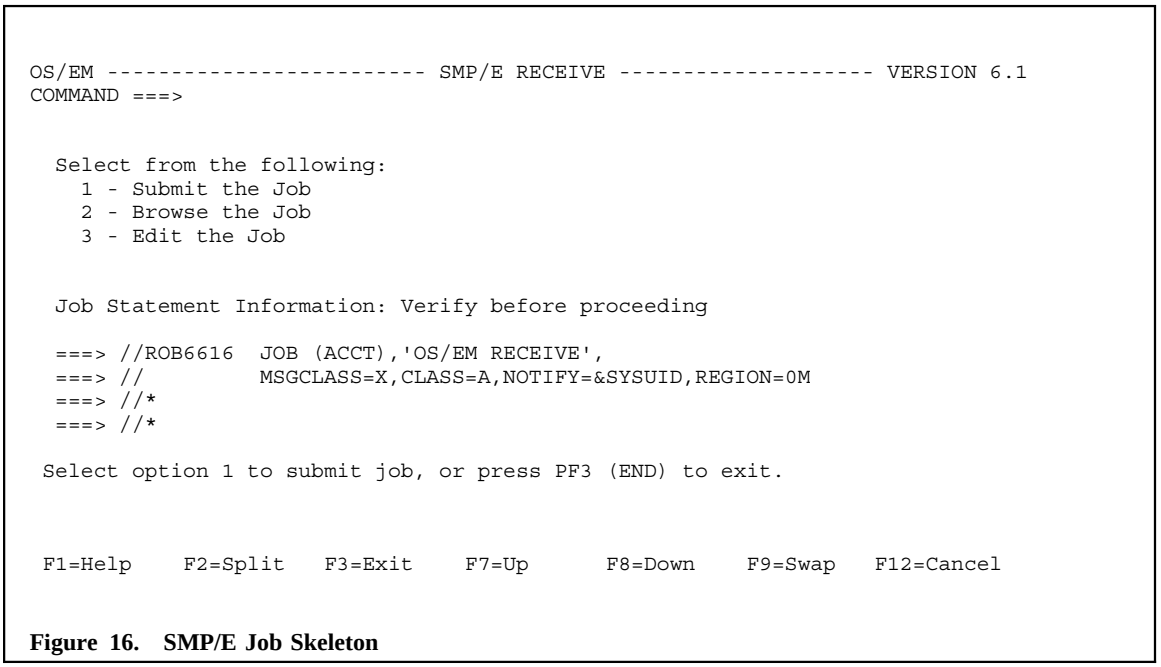

Figure 16. SMP/E Job Skeleton

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1. **Receive SYSMODS and HOLDDATA.** This option will unpack the OS/EM cumulative maintenance dataset (using the TRSMAIN utility) and then SMP/E RECEIVE the PTFs.

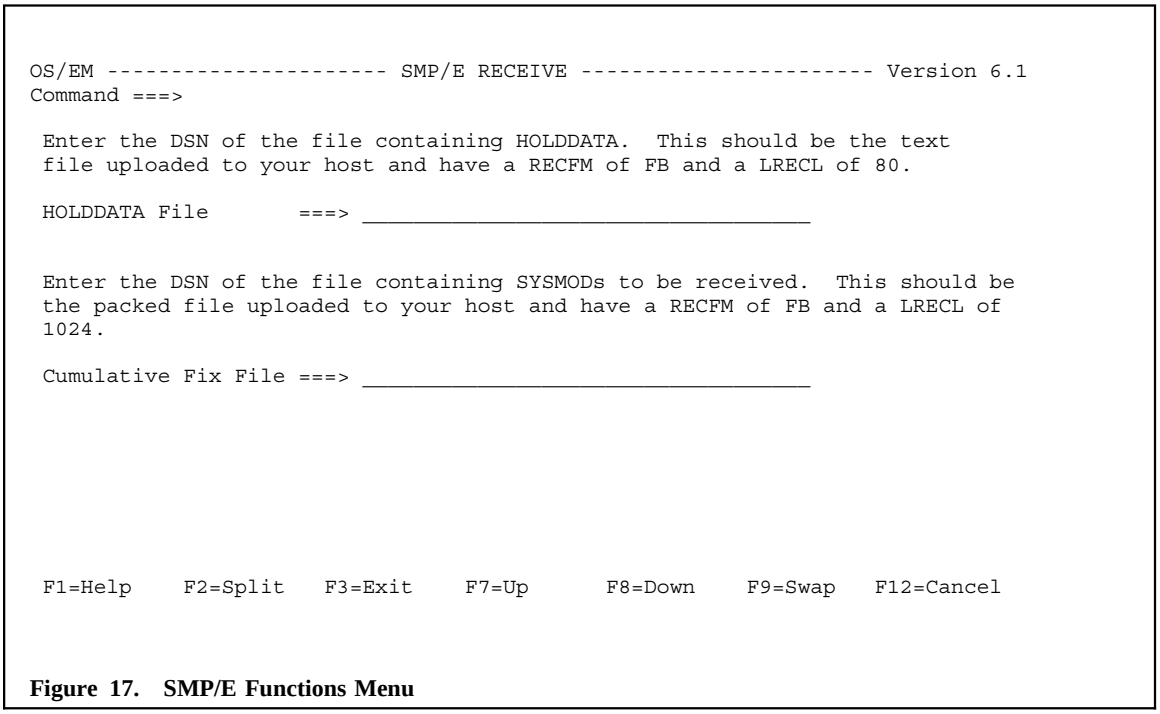

Figure 17. SMP/E Functions Menu

Enter the fully qualified name of the packed cumulative maintenance dataset and the HOLDDATA dataset. Do not use quotes. All other required datasets (i.e. the load library that has the TRSMAIN utility and the SMP/E CSI) are defined in the installation variables.

The job should complete with a return code of zero. For more information regarding the RECEIVE process or for any problem determination procedures, consult the relevant IBM SMP/E references.

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2. **Apply SYSMODS.** This option will SMP/E APPLY the received maintenance into the OS/EM target libraries.

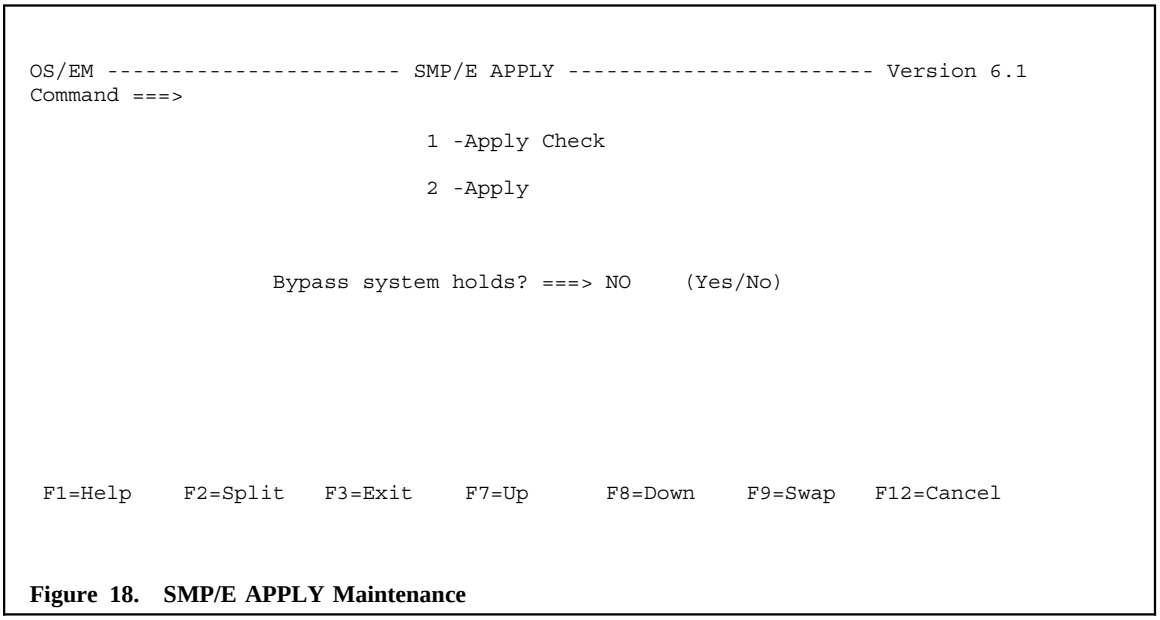

Figure 18. SMP/E APPLY Maintenance

Select the desired APPLY function and the BYPASS option. It is recommended that an APPLY CHECK is run prior to the APPLY to insure all requisites and HOLD requirements are satisfied.

All required datasets are defined in the installation variables.

The job should complete with a return code of zero (or four if HOLDs are present and have been bypassed). For more information regarding the APPLY process, the CHECK and BYPASS options, or for any problem determination procedures, consult the relevant IBM SMP/E references.

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3. **Accept SYSMODS.** This option will SMP/E ACCEPT the received maintenance into the OS/EM distribution libraries.

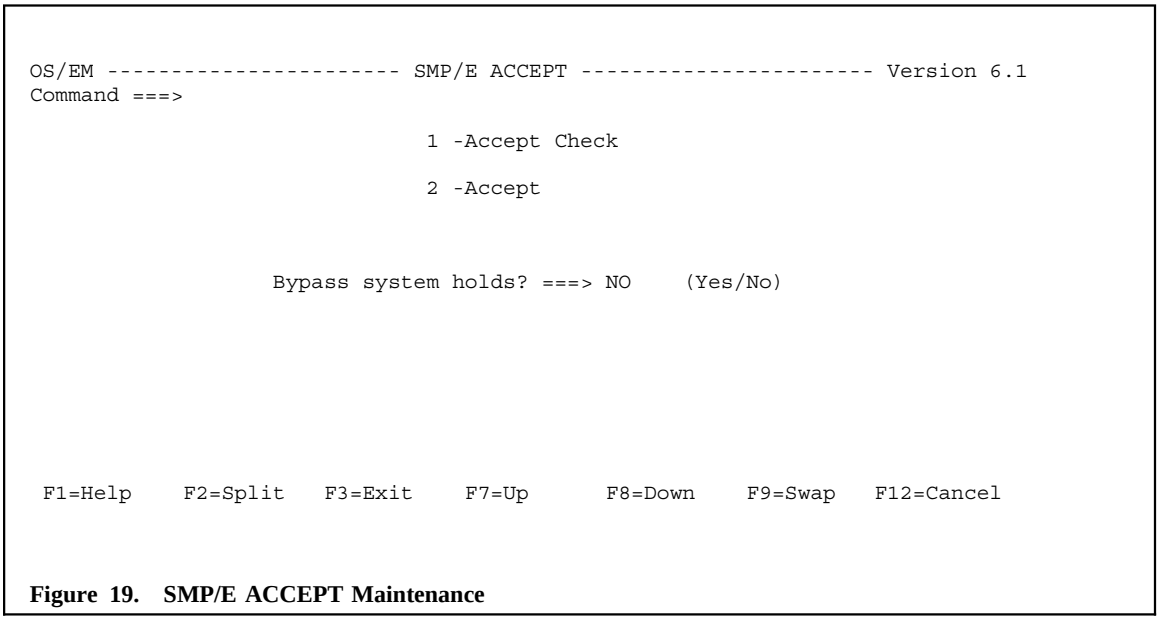

Figure 19. SMP/E ACCEPT Maintenance

Select the desired ACCEPT function and BYPASS option. It is recommended that an ACCEPT CHECK is run prior to the ACCEPT to insure all requisites and HOLD requirements are satisfied.

All required datasets are defined in the installation variables.

The job should complete with a return code of four. For more information regarding the APPLY process, the CHECK and BYPASS options, or for any problem determination procedures, consult the relevant IBM SMP/E references.

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Assemble Offset Table

This function generates the JES2 and/or JES3 offset tables. This table is critical for OS/EM's interaction with JES functionality.

The JES Offset Table(s) must be generated under the following circumstances:

- When upgrading releases of OS/EM (this is part of the OS/EM installation dialog)
- After upgrading releases of JES2 / JES3 or applying maintenance to those products
- After applying maintenance to OS/EM and PTF HOLDDATA indicates the need to generate the table

When this option is selected, the user is presented with the following selection menu:

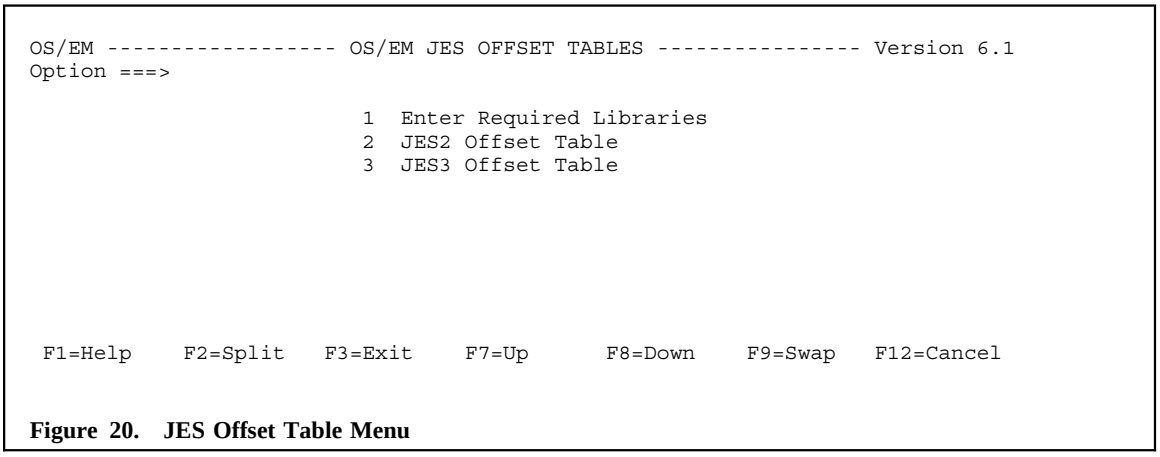

Figure 20. JES Offset Table Menu

1. **Enter Required Libraries**

   This function defines the MVS and JES libraries that are to be used for the Offset Table generation. These libraries must match the environment on which OS/EM is to run.

   The libraries are defined at installation time but may need to be modified if the Offset Table is being generated for a new environment (e.g. building a new set of SYSRES volumes).

   If the incorrect libraries are used, abends in OS/EM control modules and/or JES modules may result.

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```
OS/EM ------------ OS/EM LIBRARIES FOR OFFSET TABLES ------------ VERSION 6.1
COMMAND ===>
                                                                    More:     +
 Enter the libraries to be used to assemble the JES offset table.

 Specify libraries:                                                  Unit   Volser
 MVS  Macros  ===> SYS1.MACLIB                                      ________ ______
 MVS  MODGEN  ===> SYS1.MODGEN                                      ________ ______
 TCPIP Macros ===> TCPIP.SEZACMAC                                   ________ ______

 JES2 Macros  ===> SYS1.SHASMAC                                     ________ ______
 JES2 Source  ===> SYS1.SHASSRC                                     ________ ______
 JES2 Load    ===> SYS1.SHASLNKE                                    ________ ______

 JES3 Macros  ===> ____________________________________________     ________ ______

 Use the UNIT and VOLSER fields only if you need libraries not cataloged.
 Specify the SYS1 libraries (the libraries currently active for this IPL) if
 applying OS/EM maintenance, if preparing to apply JES2 maintenance specify
 the SMP/E target libraries (or the libraries which will be used to IPL
 the JES2 updates.)

 The libraries specified here MUST match the libraries which will be used
 at IPL time.  This means if you are preparing to apply JES2 maintenance you
 should enter the library names which contain the updated macros/source/load
 modules.  Then when these libraries are copied to the SYS1 libraries the new
 offset table should be copied at the same time.  Contact Trident Support if
 you have any questions about this procedure.

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 21. Library Definitions for JES Offset Table

Enter the appropriate library dataset names that are / will be in effect when OS/EM will be initialized.

MVS Macros This is the system macro library (normally named SYS1.MACLIB).

MVS MODGEN This is the SYSGEN or module generation macro library (normally named SYS1.MODGEN).

TCPIP Macros This is the TCPIP macro library (normally named TCPIP.SEZACMAC).

JES2 Macros This is the JES2 macro library (normally named SYS1.SHASMAC).

JES2 Source This is the JES2 source library (normally named SYS1.SHASSRC).

JES2 Load This is the JES2 link or load library. Depending on the release level of JES2, the library is normally named SYS1.SHASLINK or named SYS1.SHASLNKE).

JES3 Macros This is the JES3 macro library (normally named SYS1.SIATMAC).

If the JES Offset Table generation is for the current system, the cataloged libraries should be used and so it shouldn't be necessary to enter anything in the UNIT and VOLSER fields.

If the JES Offset Table generation is for a new environment using different SYSRES volumes, the UNIT and VOLSER fields must point to the new volumes to be used when the system is IPLed.

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When the JES Offset Table menu options 2 or 3 are selected, the user is presented with a skeleton JOB JCL statement that can be modified prior to submitting the Offset Table generation job.

```
OS/EM -------------------- CREATE JES2 OFFSET TABLE -------------- VERSION 6.1
COMMAND ===>


  Select from the following:
    1 - Submit the Job
    2 - Browse the Job
    3 - Edit the Job


  Job Statement Information: Verify before proceeding

  ===> //ROB6616  JOB (ACCT),'JES2 OFFSET TABLE',
  ===> //         MSGCLASS=X,CLASS=A,NOTIFY=&SYSUID,REGION=0M
  ===> //*
  ===> //*

 Select option 1 to submit job, or press PF3 (END) to exit.



 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 22. JES Offset Table JOB Statement

VERY IMPORTANT

- The generation job should complete with a maximum return code of one (1) for the JES2 offset table or zero (0) for the JES3 offset table.
- For JES2, the offset table is a load module with the name FEMJ2OFx where x is a suffix that is specific to the release of JES2 that is running on that system.
- For JES3, the offset table is a load module with the name FEMJ3OFF.
- If your installation uses multiple JES systems with different release or maintenance levels, the JES offset table must be generated on each of these systems.
- OS/EM will analyze the JES Offset Table during initialization and will issue warning or error messages if it detects a mismatch between the table and the current JES environment.
- S0C1 & S0C4 abends during JES initialization are very often caused by OS/EM loading a JES Offset Table that was not assembled under the current JES environment. The query report in the IPL.REPORT dataset (pointed to by the SYSTSPRT DD in the OSEM initialization procedure) displays the assembly date and source load library for the Offset Table (FEMJ2OFx or FEMJ3OFF) that was loaded by OS/EM.
- The JES Offset Tables are bound into the OS/EM target LINKLIB. When generating these tables for an existing OS/EM 6.1 environment **the load module(s) must be copied into the executable LINKLIB and then reloaded.** Refer to "Copy SMP/E Libraries to Executable Libraries" and "Implementing OS/EM Maintenance" in this chapter).

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Copy SMP/E Libraries to Executable Libraries

This function copies the contents of the selected SMP/E libraries to the corresponding executable libraries.

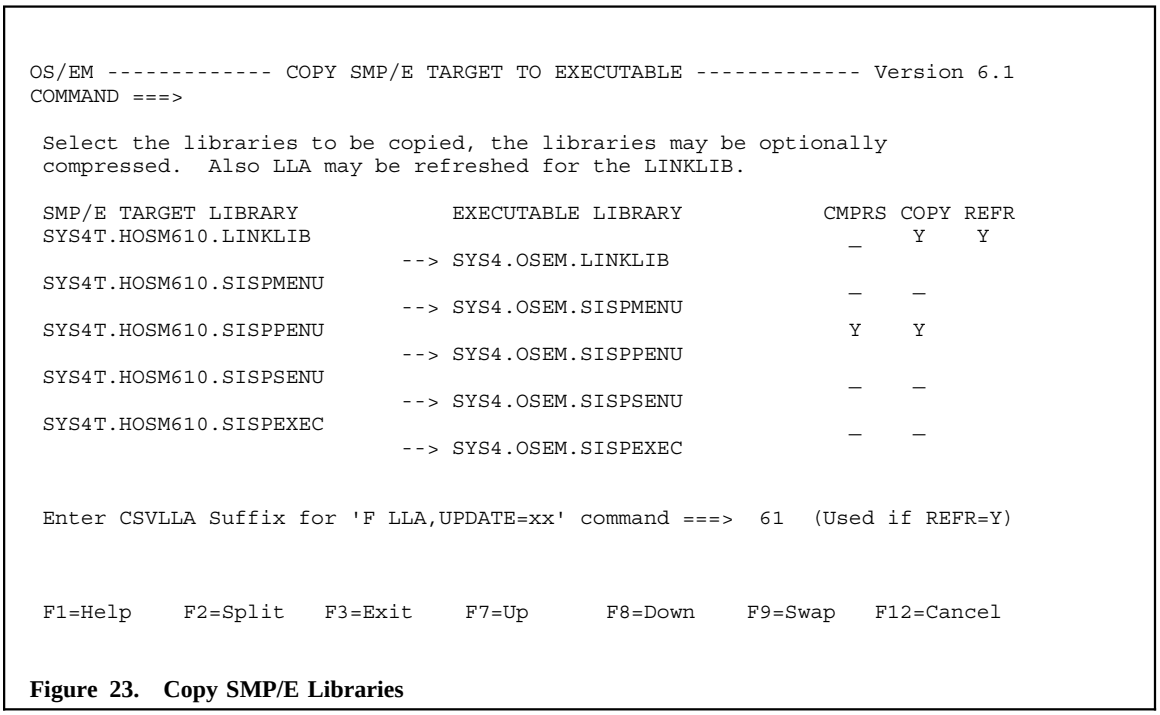

Figure 23. Copy SMP/E Libraries

The selection columns are :

CMPRS Enter **Y** if you want to compress the selected executable library prior to copying the contents of the corresponding target library.

COPY Enter **Y** if you want to copy the selected target library to the corresponding executable library.

REFR This applies only to the executable load library. Enter **Y** and specify the appropriate suffix for the system PARMLIB CSVLLAxx member if you wish to refresh the Library Lookaside (LLA) after the executable load library has been copied.

Once the appropriate libraries have been selected, pressing **PF3** will result in the JCL JOB statement selection panel being presented. Make the necessary changes and submit the job (option 1).

Note:

- The copies of ISPF libraries are performed with DISP=OLD for the executable libraries. This will mean that the copy will not start if the OS/EM ISPF dialog is in use.

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Update Installation Variables

This function allows the user to make changes to the OS/EM installation variables that were set during the initial installation of the product. Alterations to these variables will affect the operation of the OS/EM maintenance functions.

Changes made to the installation variables will affect the JCL that is submitted for the maintenance functions (e.g. JES Offset Table generation).

The principal purpose of this function is to allow the user to change executable library definitions. This permits the maintenance of multiple iterations of the OS/EM system libraries from the one ISPF environment.

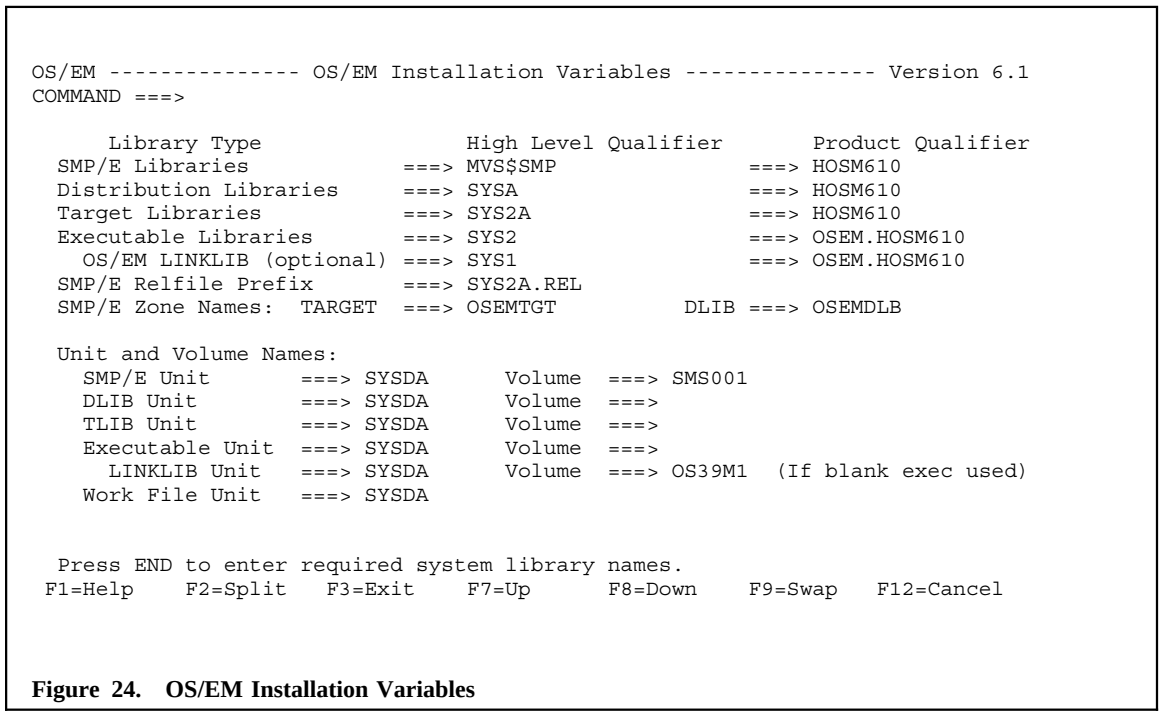

Figure 24. OS/EM Installation Variables

Notes:

- The High Level Qualifier and Product Qualifier specifications can have multiple nodes (e.g. OSEM.VER610). Do not end either of these qualifiers with a period (.).
- The OS/EM LINKLIB definitions for the DSN, Unit & Volume names are optional fields and are used if the user requires a different dataset specification from the other executable library parameters. For example, the user may have a requirement to locate the OS/EM LINKLIB in the master catalog but keep the other libraries in a user catalog.

  If these fields are left blank, the Executable Library name specifications will be used for the OS/EM LINKLIB.
- The SMP/E Unit and Volume specifications are required. The Unit and Volume specifications for the distribution, target, executable and work datasets are optional when there is SMS dataset management.

Very Important:

Use extreme caution when modifying SMP/E, target and distribution library specifications. This dialog does not change dataset & library definitions defined within SMP/E (i.e. DDDEF entries for the

OS/EM system). Problems when attempting to maintain the OS/EM system are likely if there is a mismatch between these installation variables and the SMP/E environment.

Pressing PF3 will display the OS/EM Required System Libraries panel.

```
OS/EM --------------- OS/EM Installation Variables --------------- Version 6.1
COMMAND ===>

Enter fully qualified dataset names.  Quotes are allowed but ignored.
                                                                    Unit   Volser
OS/EM Install File: SYS2A.HOSM610.DIST                             ________ ______

TRSMAIN Library:    _______________________________________________ ________ ______

COBOL SCEELKED:     CEE.SCEELKED
MVS MACLIB:         SYS1.MACLIB                                    ________ ______
MVS MODGEN:         SYS1.MODGEN                                    ________ ______
TCPIP SEZACMAC:     TCPIP.SEZACMAC                                 ________ ______

JES2 SHASMAC:       SYS1.SHASMAC                                   ________ ______
JES2 SHASSRC:       SYS1.SHASSRC                                   ________ ______
JES2 SHASLNKE:      SYS1.SHASLINK                                  ________ ______

JES3 SIATMAC:       _______________________________________________ ________ ______

Press HELP to determine which libraries should be used here.


 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 25. OS/EM Installation Variables

Notes:

- Dataset name specifications are fully qualified. Any quotes (') are ignored.
- The TRSMAIN Library DSN is optional. If the field is left blank than it is assumed that the TRSMAIN load module is located in a library defined to the LNKLST.
- The system libraries are:

  MVS Macros This is the system macro library (normally named SYS1.MACLIB).

  MVS MODGEN This is the SYSGEN or module generation macro library (normally named SYS1.MODGEN).

  TCPIP Macros This is the TCPIP macro library (normally named TCPIP.SEZACMAC).

  JES2 Macros This is the JES2 macro library (normally named SYS1.SHASMAC).

  JES2 Source This is the JES2 source library (normally named SYS1.SHASSRC).

  JES2 Load This is the JES2 link or load library. Depending on the release level of JES2, the library is normally named SYS1.SHASLINK or named SYS1.SHASLNKE).

  JES3 Macros This is the JES3 macro library (normally named SYS1.SIATMAC).

  The Unit and Volser fields are not required if the dataset is cataloged. The information may be necessary if the product is being installed on a new SYSRES volume (i.e. not the current SYSRES).

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Verify/Change Generated DSNames

This function allows the user to review and/or alter any of the dataset names that are to be used by the OS/EM maintenance functions.

```
OS/EM-------------- Verify/Change Generated DSNames -------- Row 1 to 15 of 42
 Command ===>                                                  Scroll ===> CSR

Overtype Dataset name to update entry.  Enter HELP for more information and an
explanation of the  'C' column codes of blank, 'C' and 'F'.

Type     Description              Dataset Name                                C
CSI      SMP/E GLOBAL CSI         MVS$SMP.HOSM610.GLOBAL.CSI
SMPLOG   SMP/E LOG FILE           MVS$SMP.HOSM610.GLOBAL.SMPLOG
SMPLOGA  SMP/E LOG FILE           MVS$SMP.HOSM610.GLOBAL.SMPLOGA
SMPPTS   SMP/E PTS LIBRARY        MVS$SMP.HOSM610.GLOBAL.SMPPTS
AISPEXEC DLIB REXX LIBRARY        SYSP.HOSM610.AISPEXEC
AISPMENU DLIB MESSAGE LIBRARY     SYSP.HOSM610.AISPMENU
AISPPENU DLIB PANEL LIBRARY       SYSP.HOSM610.AISPPENU
AISPSENU DLIB SKELETON LIBRARY    SYSP.HOSM610.AISPSENU
AISPTENU DLIB TABLE LIBRARY       SYSP.HOSM610.AISPTENU
AOBJLIB  DLIB OBJECT MODULES      SYSP.HOSM610.AOBJLIB
ASAMPLIB DLIB SAMPLE LIBRARY      SYSP.HOSM610.ASAMPLIB
ASEMLENU DLIB BOOKMGR BOOKS       SYSP.HOSM610.ASEMLENU
ASEMOENU DLIB BOOKMGR SHELVES     SYSP.HOSM610.ASEMOENU
ASEMXENU DLIB BOOKMGR INDEXES     SYSP.HOSM610.ASEMXENU
SMPLOG   SMP/E DLIB LOG FILE      SYSP.HOSM610.SMPLOG
 F1=HELP      F2=SPLIT     F3=END       F4=RETURN    F5=RFIND     F6=RCHANGE
 F7=UP        F8=DOWN      F9=SWAP     F10=LEFT     F11=RIGHT    F12=RETRIEVE
```

Figure 26. Verify/Change OS/EM Datasets

- Scroll through the datasets using the Up / Down PF keys (PF7 / PF8).
- Dataset names can be changed by overtyping the dataset name field and pressing enter.
- A changed DSN can be restored to the original specification by blanking out the dataset name field.
- The **C** column on the right hand side of the panel indicates the change status of the dataset:

  blank The dataset name is defined via the standards defined by the installation variables.
  C The dataset name has been changed through this panel.
  F The dataset name is not defined by the installation variables, but is explicitly defined during installation and/or maintenance.

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Update System Tables

This option is used to update OS/EM system tables that have been affected by maintenance to the product.

This option only needs to be used when specifically instructed in SMP/E HOLDDATA for the affecting PTF(s).

The following panel is an example of options that could be listed following maintenance.

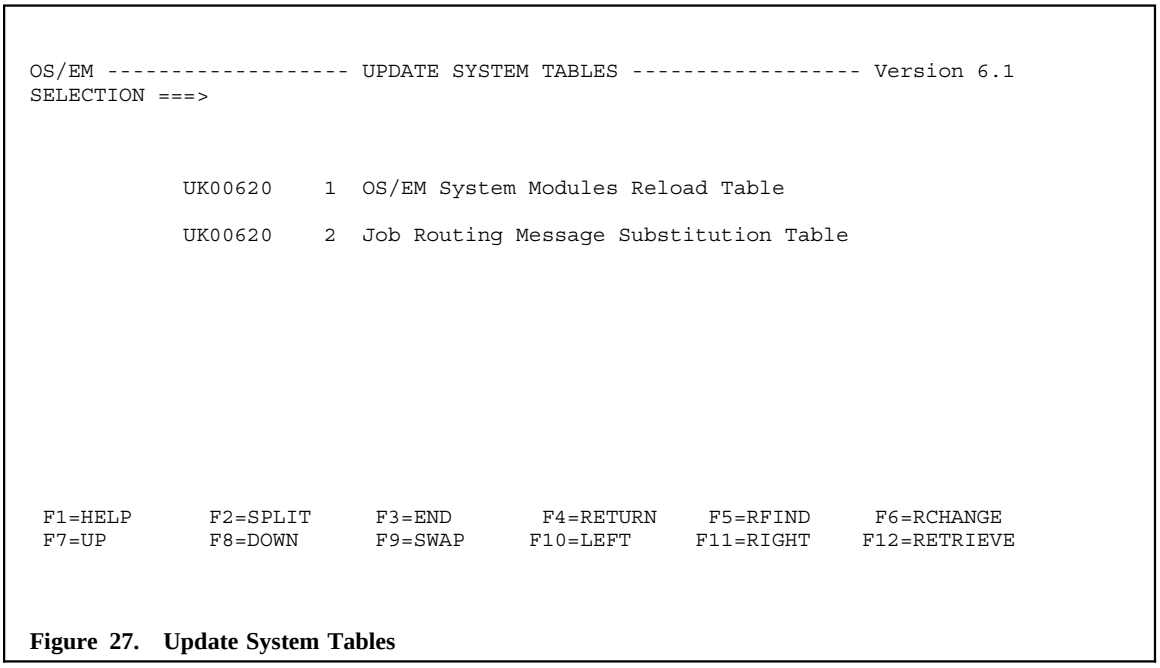

Figure 27. Update System Tables

- The PTF causing the necessary update is listed next to each selection.
- Select each option in turn to update the changed system table.
- After the system table has been rebuilt, the selection option will remain. If it is selected subsequently, a message will be displayed indicating that the table is at the appropriate maintenance level.

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Create OS/EM Tables

The create process is used when OS/EM is first installed. The function creates all of the ISPF tables which the ISPF interface uses to store the information needed to build the initialization parameter members used at IPL time.

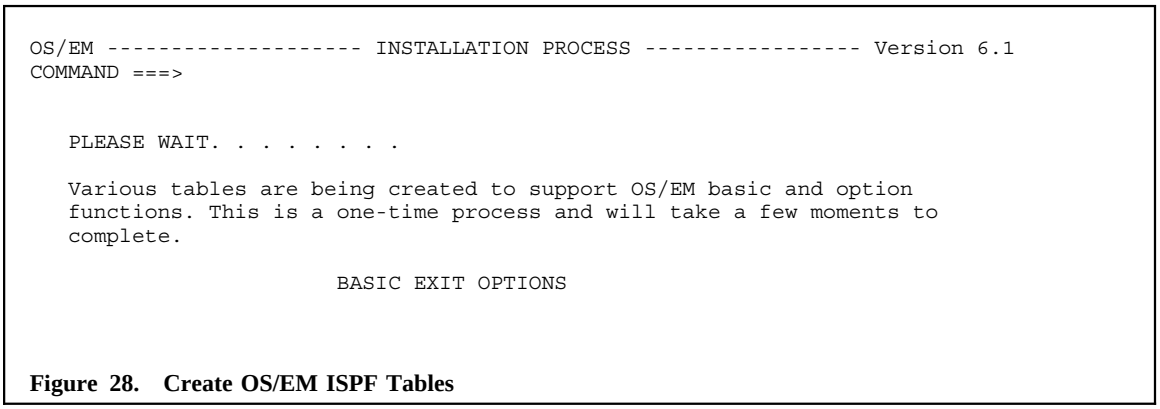

Figure 28. Create OS/EM ISPF Tables

If the tables create process fails for any reason, you cannot simply reselect it from the menu. You need to delete any tables that may have been added to the new table library first.

Use ISPF option 3.1 (Library Utility) to delete any members which may have been added.

Note: The OS/EM supplied table library (TLIB) contains three members, OSEMCMDS, OSEMKEYS and OSEMVER. Be sure these members are not deleted, or are recopied into the table library if the **CREATE** process needs to be restarted.

After the table library has been cleaned-up, re-select the CREATE process from the maintenance menu.

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Upgrade to OS/EM 6.1

The upgrade function parses a Query Report of your current OS/EM environment to determine which exits and/or optional features you are using and stores that information in ISPF tables. This function will also rebuild the initialization members.

Note: Since the upgrade function rebuilds the initialization members, it is advisable to execute this function before you IPL. Otherwise the initialization members which the install procedure places into parmlib will be empty, and no OS/EM features or user exits will be activated.

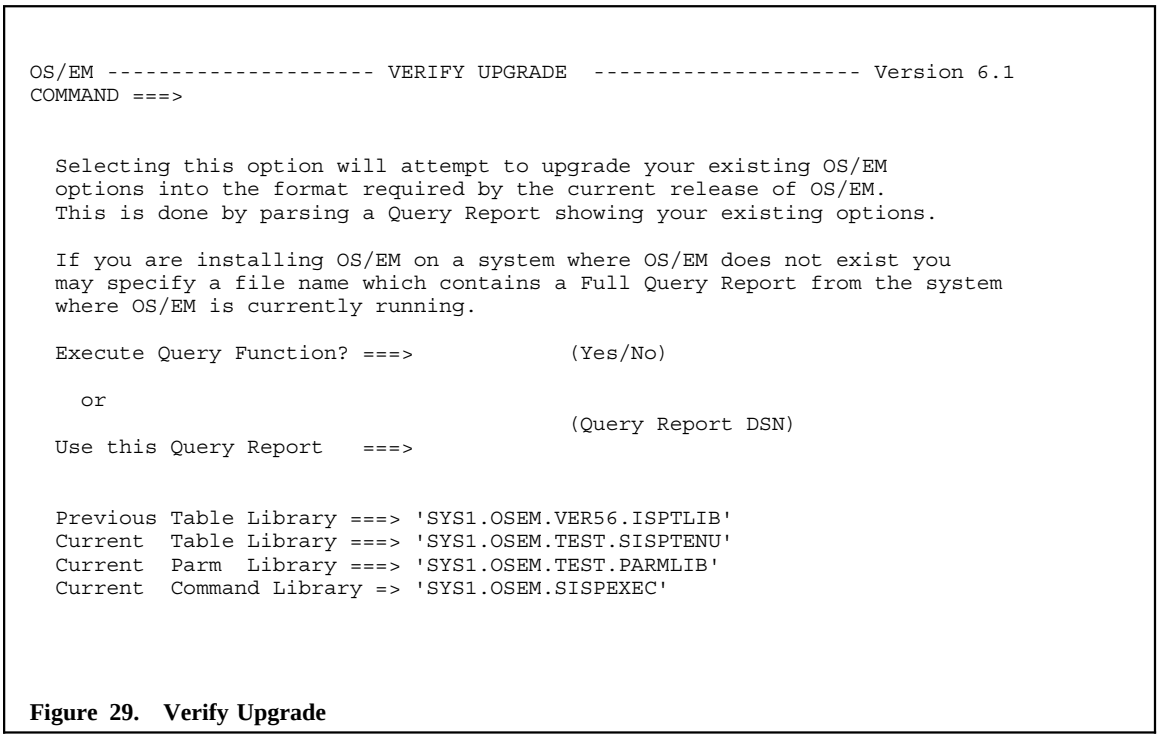

Figure 29. Verify Upgrade

1. Specify whether you want to have the Upgrade function execute the Query Function, or specify a Query Report dataset name which will be parsed.

   If you are going to run this function prior to your first IPL with the new OS/EM release, you may allow the Upgrade to execute the query directly. However, if you will be doing an IPL before the upgrade, you should create a Query Report using the **ALL** parameter and save the report so that the upgrade function will have access to it.

   Note: To successfully run the upgrade function on a different machine from where OS/EM is currently running, create a query report and point the upgrade function to it.

2. The four libraries needed for the upgrade are listed at the bottom of the panel. If any of these names are incorrect, you will need to edit the FEMSTART CLIST and correct any incorrectly entered **site variables**.

3. Press the **Enter** key to begin the upgrade.

4. Press **END** to cancel.

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Basic Exit Functions

Description

The basic OS/EM Function provides for the dynamic loading, and reloading of all supported OS/390 and z/OS Exits. Exit points may be enabled and disabled dynamically; and, where appropriate, exit points may be limited to specific jobnames giving an installation a Quality Assurance or testing environment not previously available.

OS/EM Exit Functions

- Automatic Management of Exits with predefined names for Allocation, DFP, HSM, JES2, JES3, RACF, SAF, SMF and TSO.
- Eliminates the need to IPL to refresh LPA modules that are managed by OS/EM Allocation, DFP, HSM, ISPF, JES2, JES3, RACF, SAF, SMF and TSO.
- Error Recovery for Exit abends (ESTAE and FRR as appropriate)
- Backup Exit programs specified to automatically switch to, if an Exit program abends
- Security Interface to an External Security Manager (e.g. RACF, CA-TOPSECRET, CA-ACF2) to allow access to OS/EM functions
- ISPF interface for Exit Management
- Query Interface to display Exit Status
- 255 Independent Exit programs per exit point
- Jobname limiting for each Exit program (where available)
- Valid Return code checking
- Good Return code checking
- Disabling Return code checking (To remove an Exit program from execution)
- Default Return code
- TSO Notify support for Exit programs that abend
- Loading of Exits from LINKLIBs, JOBLIB, STEPLIB, LLIB or private authorized load library
- SVC dumps for Exit program abends
- Loading of Exit programs in either CSA or ECSA depending on RMODE/AMODE addressability
- Dynamically Reload individual Exit programs
- Dynamically Reload OS/EM Controller Programs without an IPL

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- Dynamically Disable individual Exit programs

List of Exits Supported

For a complete list, see “Appendix A. Supported Exits” on page A-1.

- Allocation Exits
- DFSMS DFP Exits
- DFSMS HSM Exits
- ISPF Installation Wide Exits
- JES2 Exits
- JES3 Exits
- RACF Exits
- SAF Exits
- System Management Facilities (SMF) Exits
- TSO/E Exits

Autoinstall Feature

New to version 6.0, the OS/EM Autoinstall Feature greatly simplifies the installation and migration process by dynamically defining exit points and automatically loading both OS/EM and user exit modules.

Autoinstall provides the following functions:

- **Dynamic Enabling of Exits -**Autoinstall will automatically define and enable MVS user exits during system initialization. This eliminates the need to define these exits in the PROGxx or EXITxx system PARMLIB members.
- **Automatic Loading of LPA Modules -** Autoinstall will automatically load OS/EM control modules that are required to be resident in the FLPA / PLPA. This eliminates the need to define these modules in the IEAFIXxx and IEALPAxx system PARMLIB members.
- **Automatic Loading of Standard User Exit Modules -** OS/EM will automatically load and enable user exit modules when all the following criteria is met:

  1. There are no user exits defined in OS/EM for that user exit point
  2. The load module name matches the user exit point name
  3. The load module is located in the system LINKLST or LPA
  4. The load module is not a dummy user exit (OS/EM will examine the load module to ensure it does more than simply return to the caller).

- **Automatic Implementation of JES2 Exits -**Autoinstall will perform the following functions during JES2 initialization:

  1. Dynamically defines the OS/EM JES2 user exit interface modules.
  2. Places all user exits under OS/EM control.
  3. Processes all EXIT(xxx) and LOADMOD(yyyyyyyy) statements in the JES2 initialization parameters and dynamically defines these exits to OS/EM. The EXIT and LOADMOD statements are not processed by JES2.

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Prior releases of OS/EM required the user to modify the JES2 initialization parameters to remove existing exit & module definitions and add the OS/EM exits and load modules. Additionally, the user exits had to be manually defined to OS/EM.

Autoinstall provides a much simpler and automated implementation process requiring no initial changes to the JES2 & OS/EM parameters in order to initialize OS/EM. For more information about migrating JES2 exits into an OS/EM environment, refer to the OS/EM Installation Guide.

Basic Exit Functions Menu

Basic Exit Functions allow you to specify:

- Whether a particular exitpoint is enabled or disabled
- Whether or not there are active user exits, and what those exits are
- Up to three jobname masks per exit to limit the effect of the associated user exit, if LIMIT checking is applicable to the exitpoint
- An optional description for each of the specified user exits
    - Use the description field to document the author of the user exit, the date the user exit was installed or modified, etc.

If you wish to enable OS/EM Extended Functions for an exitpoint, such as HSM Optimizer functions, but you do not have any user exits, you do not need to "visit" Basic Function Support. The OS/EM Extended Function interface ensures that the proper specifications are made in order to generate support, and you do not need to concern yourself with which exit point(s) supports the OS/EM Extended Function you are invoking.

```
OS/EM ------------------  BASIC EXIT FUNCTIONS ------------------ Version 6.1
COMMAND ===>




                              1  JES2 Exits
                              2  JES3 Exits
                              3  MVS  Exits
```

Figure 30. Basic Exit Functions

Each of these paths is presented in the following sections:

1. JES2 Exits (see “JES2 Exits” on page 4-4)
2. JES3 Exits (see “JES3 Exits” on page 4-11)
3. MVS Exits (see “MVS Exits” on page 4-18)

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JES2 Exits

This panel displays all of the JES2 exits in alphabetical order by exit name and tells you which JES2 user exits are being used. You may page up and down with PFK7 and PFK8.

```
OS/EM ------------------- JES2 EXIT SELECTION ------------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


(CMD = Exit Point (O)ptions, (U)ser Exits

           Exit        User
CMD Active Point       Exits  Description
 '  ACTIVE EXIT000            Pre-initialization
 '  ACTIVE EXIT001            Print/Punch Separators
 '  ACTIVE EXIT002      YES   Job Statement Scan
 '  ACTIVE EXIT003            Job Statement Accounting Field Scan
 '  ACTIVE EXIT004            JCL and Job Statement Account
 '  ACTIVE EXIT005            JES2 Command Preprocessor
 '  ACTIVE EXIT006            Converter/Interpreter Text Scan
 '  ACTIVE EXIT007            JCT Read/Write
 '  ACTIVE EXIT008            Control Block Read/Write
 '  ACTIVE EXIT009            Job Output Overflow
 '  ACTIVE EXIT010            $WTO Screen
 '  ACTIVE EXIT011            Spool Partitioning Allocation ($TRACK)
 '  ACTIVE EXIT012            Spool Partitioning Allocation ($STRAK)
 '  ACTIVE EXIT013            TSO/E Transmit Facility Screen/Notification
 '  ACTIVE EXIT014            Job Queue Work Select ($QGET)
 '  ACTIVE EXIT015            Output Dataset/Copy Select
```

Figure 31. JES2 Exit Selection List

Line commands are:

O Define exit point options

This function controls the execution options for the exit point.

"JES2 Exit Point Options" on page 4-5 documents the resulting panel(s) and actions for this selection.

U Define user exit modules

This function defines the user exit modules to be executed for the exit point and their execution sequence.

If there are load modules currently defined for this user exit, the user exit module selection list is displayed (see "JES2 User Exit Module Selection" on page 4-7).

If no load modules are defined for this user exit, the user exit module definition panel is displayed (see "JES2 User Exit Module Definition" on page 4-9).

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JES2 Exit Point Options

The following panel is displayed when the when the **O** line command is entered for a JES2 exit point.

```
OS/EM ---------------- EXIT POINT EXIT002 OPTIONS --------------- Version 6.1
COMMAND ===>


  Exit Point EXIT002     ===> ACTIVE                  (Active/Inactive/Disable)

  OS/EM Exit Called      ===> FIRST                         (First/Last)
  Notify For OS/EM ABEND ===> _______ , _______ , _______    (Up to 3 TSO IDs)
  Use Autoinstall?       ===> YES                          (Yes or No)

  Exit Re-entrant Key    ===> 0                               (0 or 1)

  Default Return Code ===>  ___    or Reset ===> Y       (0-999 or Y to reset)


  Valid Return Codes:    or Reset ===> Y                  (Enter Y to reset)
   ____________________________________________________


  Good Return Codes      or Reset ===> Y                  (Enter Y to reset)
   ____________________________________________________


  Disabling Return Codes or Reset ===> Y                  (Enter Y to reset)
   ____________________________________________________


  Enter any combination of the following separated by commas or spaces:
  0,4,8,12,16,20,24,28,32,36,40,44,ANY,GE255,LT255,NONZERO or the literal NONE
```

Figure 32. JES2 Exit Point Options

This field entry panel allows you to set the general execution options for the selected JES2 user exit.

1. Exit Point xxxxxxxx

   ACTIVE - the defined JES2 exit(s) will be loaded at IPL time and executed when the exit is driven.

   INACTIVE - the defined JES2 exit(s) will be loaded at IPL time but will not be executed when the exit is driven.

   DISABLE - the defined JES2 exit(s) will not be loaded or executed.

2. OS/EM Exit Called

   FIRST - specifies that the OS/EM Extended Functions will be applied before any JES2 user exit modules are invoked for this exit point.

   LAST - specifies that the OS/EM Extended Functions will be applied after the JES2 user exits are invoked for this exit point.

   Note: If the exit being displayed does not have associated OS/EM Extended Functions, the OS/EM fields will be locked.

3. Notify for OS/EM ABEND

   Enter up to three **TSO User IDs** or **Notify Group Names** to be notified if an ABEND occurs in any of the OS/EM extended functions for this JES2 exit point.

4. Use Autoinstall?

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YES - OS/EM will scan the JES2 initialization parameters for LOADMOD and EXIT statements and will load and activate the specified user exits.

NO - OS/EM will ignore LOADMOD and EXIT statements

Note: If **NO** is specified, any EXIT and LOADMOD statements for the user exit point will be processed by JES2. The exit will not be under the control of OS/EM.

5. Exit Re-entrant Key

   0 - the JES2 exit modules must be MVS re-entrant.

   1 - the JES2 exit modules need not be MVS re-entrant.

   Note: Key 0 programs may be loaded to LPA, key 1 programs will be loaded into CSA.

6. Default Return Code

   The return code (register 15) passed by the OS/EM exit interface if no User exit modules are present, if the exit module controller module is not loaded, or some other internal error has occurred. There is a default return code provided by the exit interface module for each JES2 exit point that is managed. Use this option with extreme caution.

7. Valid Return Codes

   OS/EM checks for valid return codes (register 15) being issued by user exit modules as defined by the IBM JES2 exit programming documentation for each exit point. The valid return codes for each IBM JES2 exit point are built into OS/EM. If anything is specified it completely replaces the IBM list. Use this option with extreme caution.

8. Good Return Codes

   OS/EM checks for good return codes (register 15) being issued by user exit modules. A good return code allows subsequent user exit modules to be called. OS/EM provides a default list. For example, if a user exit for IEFUTL set the return code to zero (indicating the job processing is to be cancelled), then no other user exit modules would be called, including the optional features if they were to be called last. Check the IBM JES2 exit programming documentation to determine which return codes are valid for good return codes. If anything is specified it completely replaces the IBM list. Use this option with extreme caution.

9. Disabling Return Codes

   OS/EM checks for a return code (register 15) being issued by a user exit module then disables that user exit module from being executed again. This option is primarily provided for JES3 support, but could be used for one time loading of tables, etc.

Note: When specifying return codes, enter any combination of the following values separated by blanks or commas:

- 0,4,8,12,16,20,24,28,32,36,40,44
- ANY
- GE255
- LT255
- NONZERO
- NONE

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JES2 User Exit Module Selection

The following panel is displayed when the **U** line command is entered for a JES2 user exit point.

```
OS/EM -------------- USER EXIT SELECTION - EXIT001  -------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR


(S)elect, (C)opy, (M)ove, (B)efore, (A)fter, (I)nsert, (D)elete), (R)epeat
             Primary/Backup
SEL Active      Names             Description
 '   YES   RDJESX01 : USER01__    Xerox Separators_____________________________
           ________ : ________    ____________________________________________
 '   ___   ________ : ________    ____________________________________________
           ________ : ________    ____________________________________________
 '   ___   ________ : ________    ____________________________________________
           ________ : ________    ____________________________________________
 '   ___   ________ : ________    ____________________________________________
           ________ : ________    ____________________________________________
 '   ___   ________ : ________    ____________________________________________
           ________ : ________    ____________________________________________
******************************* Bottom of data ********************************
```

Figure 33. JES2 User Exit Module Selection

This panel displays the modules defined for the selected JES2 exit point. The user can add & delete modules entries, update entries and change the execution sequence of the user exit modules.

Line commands are:

S Select a user exit module entry

This function displays the user exit module field entry panel and allows the user to modify the definition parameters for that module.

"JES2 User Exit Module Definition" on page 4-9 documents the resulting panel(s) and actions for this selection.

I Insert entry

This function adds an empty module entry immediately following the specified entry. This blank entry can then be defined by using the **S** line command to edit the module details.

D Delete entry

This function deletes the specified module entry.

C Copy entry

This function makes a copy of the specified entry. This line command is used in conjunction with the **A** and **B** line commands to control the location of the copied entry.

M Move entry

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This function relocates the specified entry within the module selection list. This line command is used in conjunction with the **A** and **B** line commands to control the new location of the moved entry.

R Repeat entry

This function duplicates the specified entry and inserts it immediately following the specified entry.

A Locate **AFTER**

This function locates a copied/moved entry immediately after the selected entry.

B Locate **BEFORE**

This function locates a copied/moved entry immediately before the selected entry.

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JES2 User Exit Module Definition

The following panel is displayed when the **S** line command is entered in the JES2 User Exit Module display panel.

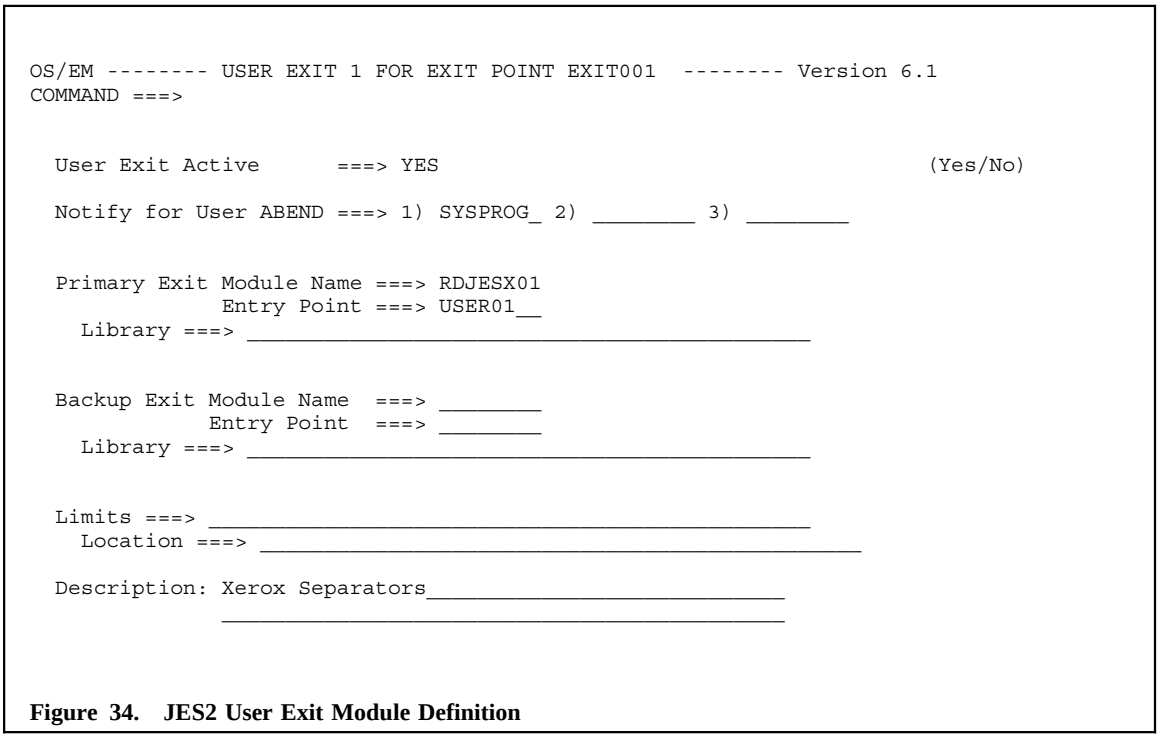

Figure 34. JES2 User Exit Module Definition

This field entry panel defines the characteristics of the user exit module to be executed.

1. User Exit Active

   YES - the defined JES2 exit module will be loaded at IPL time and executed when the exit is driven.

   NO - the defined JES2 exit(s) will not be loaded or executed.

2. Notify for User Exit ABEND

   Enter up to three **TSO User IDs** or **Notify Group Names** to be notified if an ABEND occurs in the defined user exit module for this JES2 exit point.

3. Primary User Exit - this is the user exit module to be executed when the JES2 exit is driven.

   a. Module Name - the name of the load module (or alias) to be executed.
   b. Entry Point - the name of the load module entry point to be used.
   c. Library - if the load module does not reside in a library defined in the system's LINKLIST, you may specify the name of the load library dataset. The dataset name with single quotes (') and the library must be APF authorized.

      Note: If a library is specified and the load module is not found in that library, OS/EM will not continue to search for the module and it will not be loaded.

4. Backup User Exit - this user exit module (if specified) will be used in the event that an ABEND occurs in the primary module.

   a. Module Name - the name of the load module (or alias) to be executed.
   b. Entry Point - the name of the load module entry point to be used.

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c. Library - if the load module does not reside in a library defined in the system's LINKLIST, you may specify the name of the load library dataset. The dataset name with single quotes (') and the library must be APF authorized.

Note: If a library is specified and the load module is not found in that library, OS/EM will not continue to search for the module and it will not be loaded.

5. Limits

This field allows the execution of the user exit module to be restricted to specific jobnames and/or jobname masks. Multiple names or masks should be separated by spaces.

This is particularly useful for limiting the scope of an exit module while it is being tested by restricting its execution to specific test jobs. When the module is to be put into production, the execution of the exit can be made global by removing the jobname limits.

Note: If the exit point does not support limits this field will be locked and no entry will be allowed.

6. Location

This specifies the address of the jobname field in the parameters being passed to this user exit. Refer to the TSO TEST command for a discussion of addressing conventions for this parameter. The value contained at the specified address will be compared to the jobname specified by the **limits** entry above and if a match is found the exit is allowed to execute.

7. Description

This fields provides an area to document the function of the user exit module.

Limit Masking

Job Name Masks: The following table shows the allowable mask characters:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

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JES3 Exits

This panel displays all of the JES3 exits in alphabetical order by exit name and tells you which JES3 user exits are being used. You may page up and down with PFK7 and PFK8.

```
OS/EM -------------------  EXIT SELECTION ----------------------- Version 6.1
COMMAND ===>                                                SCROLL ===> CSR


(CMD = Exit Point (O)ptions, (U)ser Exits)

           Exit     User
CMD Active Point    Exits  Description
 '  ACTIVE IATUX00         Reserved Name
 '  ACTIVE IATUX01         Reserved Name
 '  ACTIVE IATUX02         Reserved Name
 '  ACTIVE IATUX03         Examine Converter/Interpreter Text
 '  ACTIVE IATUX04         Examine Job Information from JCL
 '  ACTIVE IATUX05         Examine Step Information from JCL
 '  ACTIVE IATUX06         Examine DD Statement Information from JCL
 '  ACTIVE IATUX07         Examine/Substitute Unit, Type and VOLSER Info
 '  ACTIVE IATUX08         Examine Setup Information
 '  ACTIVE IATUX09         Examine Final Job Status, JST and JVT
 '  ACTIVE IATUX10         Generate a Message
 '  ACTIVE IATUX11         Inhibit Printing of LOCATE Request/Response
 '  ACTIVE IATUX12         Reserved Name
 '  ACTIVE IATUX13         Reserved Name
 '  ACTIVE IATUX14         Job Validation/Restart LOCATE Req/Response
 '  ACTIVE IATUX15         Scan an Initialization Statement
```

Figure 35. Basic JES3 Exit Selection

Line commands are:

O Define exit point options

This function controls the execution options for the exit point.

"JES3 User Exit Options" on page 4-12 documents the resulting panel(s) and actions for this selection.

U Define user exit modules

This function defines the user exit modules to be executed for the exit point and their execution sequence.

If there are load modules currently defined for this user exit, the user exit module selection list is displayed (see "JES3 User Exit Modules" on page 4-14).

If no load modules are defined for this user exit, the user exit module definition panel is displayed (see "JES3 User Exit Module Definition" on page 4-16).

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JES3 User Exit Options

The following panel is displayed when the when the **O** line command is entered for a JES3 user exit point.

```
OS/EM ---------------- EXIT POINT IATUX14 OPTIONS --------------- Version 6.1
COMMAND ===>


  Exit Point IATUX14     ===> ACTIVE                 (Active/Inactive/Disable)

  OS/EM Exit Called      ===> FIRST                          (First/Last)
  Notify For OS/EM ABEND ===> ________ , ________ , ________   (Up to 3 TSO IDs)

  Linkage Edit Style     ===> ______                   (BAKR/BALR/ARET/ARETRC)

  Default Return Code ===>  ___    or Reset ===> Y       (0-999 or Y to reset)
  Default R15 Value   ===>  ___


  Valid Return Codes:    or Reset ===> Y                   (Enter Y to reset)
   ____________________________________________________
  Valid R15 Values:
   ____________________________________________________


  Good Return Codes      or Reset ===> Y                   (Enter Y to reset)
   ____________________________________________________
  Good R15 Values:
   ____________________________________________________


  Disabling Return Codes or Reset ===> Y                   (Enter Y to reset)
   ____________________________________________________
  Disabling R15 Values
   ____________________________________________________

  Enter any combination of the following separated by commas or spaces:
  0,4,8,12,16,20,24,28,32,36,40,44,ANY,GE255,LT255,NONZERO or the literal NONE
```

Figure 36. JES3 User Exit Options

This field entry panel allows you to set the general execution options for the selected JES3 user exit.

1. Exit Point xxxxxxxx

   ACTIVE - the defined JES3 exit(s) will be loaded at IPL time and executed when the exit is driven.

   INACTIVE - the defined JES3 exit(s) will be loaded at IPL time but will not be executed when the exit is driven.

   DISABLE - the defined JES3 exit(s) will not be loaded or executed.

2. OS/EM Exit Called

   FIRST - specifies that the OS/EM Extended Functions will be applied before any JES3 user exit modules are invoked for this exit point.

   LAST - specifies that the OS/EM Extended Functions will be applied after the JES3 user exits are invoked for this exit point.

   Note: If the exit being displayed does not have associated OS/EM Extended Functions, the OS/EM fields will be locked.

3. Notify for OS/EM ABEND

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Enter up to three **TSO User IDs** or **Notify Group Names** to be notified if an ABEND occurs in any of the OS/EM extended functions for this JES3 exit point.

4. Exit Linkage Style

   BAKR - The exit is called using the BAKR (Branch and Stack) instruction.

   BALR - The exit is called using the BALR (Branch and Link Register) instruction.

   ARET - The exit is called using the ACALL macro and control is returned with the ARETURN macro **without** the RC= parameter.

   ARETRC - The exit is called using the ACALL macro and control is returned with the ARETURN macro **with** the RC= parameter.

   Note: For more information about these program linkage options, refer to the IBM JES3 Customization manual.

5. Default Return Code

   The return code (register 15) passed by the OS/EM exit interface if no User exit modules are present, if the exit module controller module is not loaded, or some other internal error has occurred. There is a default return code provided by the exit interface module for each JES3 exit point that is managed. Use this option with extreme caution.

6. Valid Return Codes

   OS/EM checks for valid return codes (register 15) being issued by user exit modules as defined by the IBM JES3 exit programming documentation for each exit point. The valid return codes for each IBM JES3 exit point are built into OS/EM. If anything is specified it completely replaces the IBM list. Use this option with extreme caution.

7. Good Return Codes

   OS/EM checks for good return codes (register 15) being issued by user exit modules. A good return code allows subsequent user exit modules to be called. OS/EM provides a default list. For example, if a user exit for IEFUTL set the return code to zero (indicating the job processing is to be cancelled), then no other user exit modules would be called, including the optional features if they were to be called last. Check the IBM JES3 exit programming documentation to determine which return codes are valid for good return codes. If anything is specified it completely replaces the IBM list. Use this option with extreme caution.

8. Disabling Return Codes

   OS/EM checks for a return code (register 15) being issued by a user exit module then disables that user exit module from being executed again. This option is primarily provided for JES3 support, but could be used for one time loading of tables, etc.

Note: When specifying return codes, enter any combination of the following values separated by blanks or commas:

- 0,4,8,12,16,20,24,28,32,36,40,44
- ANY
- GE255
- LT255
- NONZERO
- NONE

For JES3, there is a second set of return code values - Default / Valid / Good / Disabling R15 Values. These settings are applicable when the user exit uses ARETURN RC= (ARETC) program linkage conventions.

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JES3 User Exit Modules

The following panel is displayed when the when the **U** line command is entered for a JES3 user exit point.

```
OS/EM -------------- USER EXIT SELECTION - IATUX20  -------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


(S)elect, (C)opy, (M)ove, (B)efore, (A)fter, (I)nsert, (D)elete), (R)epeat
             Primary/Backup
SEL  Active      Names      Description
 '     ___      J3USRX9_     ____________________________________________
                 ________     ____________________________________________
 '     ___       ________     ____________________________________________
                 ________     ____________________________________________
 '     ___       ________     ____________________________________________
                 ________     ____________________________________________
 '     ___       ________     ____________________________________________
                 ________     ____________________________________________
 '     ___       ________     ____________________________________________
                 ________     ____________________________________________
******************************* Bottom of data ********************************
```

Figure 37. JES3 User Exit Modules

This panel displays the modules defined for the selected JES3 exit point. The user can add & delete modules entries, update entries and change the execution sequence of the user exit modules.

Line commands are:

S Select a user exit module entry

This function displays the user exit module field entry panel and allows the user to modify the definition parameters for that module.

"JES3 User Exit Module Definition" on page 4-16 documents the resulting panel(s) and actions for this selection.

I Insert entry

This function adds an empty module entry immediately following the specified entry. This blank entry can then be defined by using the **S** line command to edit the module details.

D Delete entry

This function deletes the specified module entry.

C Copy entry

This function makes a copy of the specified entry. This line command is used in conjunction with the **A** and **B** line commands to control the location of the copied entry.

M Move entry

This function relocates the specified entry within the module selection list. This line command is used in conjunction with the **A** and **B** line commands to control the new location of the moved entry.

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R Repeat entry

This function duplicates the specified entry and inserts it immediately following the specified entry.

A Locate **AFTER**

This function locates a copied/moved entry immediately after the selected entry.

B Locate **BEFORE**

This function locates a copied/moved entry immediately before the selected entry.

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JES3 User Exit Module Definition

The following panel is displayed when the **S** line command is entered in the JES3 User Exit Module display panel.

```
OS/EM -------- USER EXIT 1 FOR EXIT POINT IATUX03 -------- Version 6.1
COMMAND ===>


  User Exit Active      ===> YES                                    (Yes/No)

  Notify for User ABEND ===> 1) SYSPROG_ 2) ________ 3) ________


  Primary Exit Module Name ===> J3USRX9
    Library ===> ____________________________________________


  Backup Exit Module Name  ===> ________
    Library ===> ____________________________________________


  Limits ===> ____________________________________________
    Location ===> ____________________________________________

  Description: ____________________________________________
               ____________________________________________
```

Figure 38. JES3 User Exit Module Definition Panel

This field entry panel defines the characteristics of the user exit module to be executed.

1. User Exit Active

   YES - the defined JES3 exit module will be loaded at IPL time and executed when the exit is driven.

   NO - the defined JES3 exit(s) will not be loaded or executed.

2. Notify for User Exit ABEND

   Enter up to three **TSO User IDs** or **Notify Group Names** to be notified if an ABEND occurs in the defined user exit module for this JES3 exit point.

3. Primary User Exit - this is the user exit module to be executed when the JES3 exit is driven.

   a. Module Name - the name of the load module (or alias) to be executed.
   b. Entry Point - the name of the load module entry point to be used.
   c. Library - if the load module does not reside in a library defined in the system's LINKLIST, you may specify the name of the load library dataset. The dataset name with single quotes (') and the library must be APF authorized.

      Note: If a library is specified and the load module is not found in that library, OS/EM will not continue to search for the module and it will not be loaded.

4. Backup User Exit - this user exit module (if specified) will be used in the event that an ABEND occurs in the primary module.

   a. Module Name - the name of the load module (or alias) to be executed.
   b. Entry Point - the name of the load module entry point to be used.
   c. Library - if the load module does not reside in a library defined in the system's LINKLIST, you may specify the name of the load library dataset. The dataset name with single quotes (') and the library must be APF authorized.

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Note: If a library is specified and the load module is not found in that library, OS/EM will not continue to search for the module and it will not be loaded.

5. Limits

   This field allows the execution of the user exit module to be restricted to specific jobnames and/or jobname masks. Multiple names or masks should be separated by spaces.

   This is particularly useful for limiting the scope of an exit module while it is being tested by restricting its execution to specific test jobs. When the module is to be put into production, the execution of the exit can be made global by removing the jobname limits.

   Note: If the exit point does not support limits this field will be locked and no entry will be allowed.

6. Location

   This specifies the address of the jobname field in the parameters being passed to this user exit. Refer to the TSO TEST command for a discussion of addressing conventions for this parameter. The value contained at the specified address will be compared to the jobname specified by the **limits** entry above and if a match is found the exit is allowed to execute.

7. Description

   This fields provides an area to document the function of the user exit module.

Limit Masking

Job Name Masks: The following table shows the allowable mask characters:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

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MVS Exits

This panel displays all of the MVS exits in alphabetical order by exit name and tells you which MVS user exits are being used. You may page up and down with PFK7 and PFK8.

```
OS/EM ------------------- BASIC EXIT SELECTION ------------------ Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


(CMD = Exit Point (O)ptions, (U)ser Exits)
    Exit               Exit     User
CMD Type      Active   Point    Exits Description
 '  SMF       ACTIVE   IEFACTRT  YES  SMF Job/Step Termination
 '  ALLOC     ACTIVE   IEFALLOD       Allocated/Offline Device
 '  ALLOC     ACTIVE   IEFALLSW       Specific Waits
 '  ALLOC     ACTIVE   IEFALLVE       Volume Enqueue
 '  ALLOC     ACTIVE   IEFALLVM       Volume Mount
 '  ALLOC     ACTIVE   IEFDB401       Allocation Input Validation (SVC99)
 '  SMF       ACTIVE   IEFUAV         User Account Validation
 '  SMF       ACTIVE   IEFUJI         Job Initiation
 '  SMF       ACTIVE   IEFUJP         Job Purge
 '  SMF       ACTIVE   IEFUJV         Job Validation
 '  SMF       ACTIVE   IEFUSI         Step Initiation
 '  SMF       ACTIVE   IEFUSO         SYSOUT OUTLIM
 '  SMF       ACTIVE   IEFUTL         Time Limits
 '  SMF       ACTIVE   IEFU29         SMF Dump
 '  SMF       ACTIVE   IEFU83         SMF Record
```

Figure 39. Basic MVS Exit Selection

Line commands are:

O Define exit point options

This function controls the execution options for the exit point.

“MVS User Exit Options” on page 4-19 documents the resulting panel(s) and actions for this selection.

U Define user exit modules

This function defines the user exit modules to be executed for the exit point and their execution sequence.

If there are load modules currently defined for this user exit, the user exit module selection list is displayed (see “MVS User Exit Modules” on page 4-21).

If no load modules are defined for this user exit, the user exit module definition panel is displayed (see “MVS User Exit Module Definition” on page 4-23).

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MVS User Exit Options

The following panel is displayed when the when the **O** line command is entered for a MVS exit point.

```
OS/EM ---------------- EXIT POINT IEFACTRT OPTIONS --------------- Version 6.1
COMMAND ===>

                                                                More:     +
  Exit Point IEFACTRT    ===> ACTIVE                 (Active/Inactive/Disable)

  OS/EM Exit Called      ===> FIRST                              (First/Last)
  Notify For OS/EM ABEND ===>         ,        ,             (Up to 3 TSO IDs)

  Default Return Code ===>  ___    or Reset ===> Y       (0-999 or Y to reset)


  Valid Return Codes:    or Reset ===> Y                   (Enter Y to reset)
   ____________________________________________________


  Good Return Codes      or Reset ===> Y                   (Enter Y to reset)
   ____________________________________________________


  Disabling Return Codes or Reset ===> Y                   (Enter Y to reset)
   ____________________________________________________


  Enter any combination of the following separated by commas or spaces:
  0,4,8,12,16,20,24,28,32,36,40,44,ANY,GE255,LT255,NONZERO or the literal NONE
```

Figure 40. MVS User Exit Options

This field entry panel allows you to set the general execution options for the selected MVS user exit.

1. Exit Point xxxxxxxx

   ACTIVE - the defined MVS exit(s) will be loaded at IPL time and executed when the exit is driven.

   INACTIVE - the defined MVS exit(s) will be loaded at IPL time but will not be executed when the exit is driven.

   DISABLE - the defined MVS exit(s) will not be loaded or executed.

2. OS/EM Exit Called

   FIRST - specifies that the OS/EM Extended Functions will be applied before any MVS user exit modules are invoked for this exit point.

   LAST - specifies that the OS/EM Extended Functions will be applied after the MVS user exits are invoked for this exit point.

   Note: If the exit being displayed does not have associated OS/EM Extended Functions, the OS/EM fields will be locked.

3. Notify for OS/EM ABEND

   Enter up to three **TSO User IDs** or **Notify Group Names** to be notified if an ABEND occurs in any of the OS/EM extended functions for this MVS exit point.

4. Default Return Code

   The return code (register 15) passed by the OS/EM exit interface if no User exit modules are present, if the exit module controller module is not loaded, or some other internal error has occurred. There

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is a default return code provided by the exit interface module for each MVS exit point that is managed. Use this option with extreme caution.

5. Valid Return Codes

   OS/EM checks for valid return codes (register 15) being issued by user exit modules as defined by the IBM MVS exit programming documentation for each exit point. The valid return codes for each IBM MVS exit point are built into OS/EM. If anything is specified it completely replaces the IBM list. Use this option with extreme caution.

6. Good Return Codes

   OS/EM checks for good return codes (register 15) being issued by user exit modules. A good return code allows subsequent user exit modules to be called. OS/EM provides a default list. For example, if a user exit for IEFUTL set the return code to zero (indicating the job processing is to be cancelled), then no other user exit modules would be called, including the optional features if they were to be called last. Check the IBM MVS exit programming documentation to determine which return codes are valid for good return codes. If anything is specified it completely replaces the IBM list. Use this option with extreme caution.

7. Disabling Return Codes

   OS/EM checks for a return code (register 15) being issued by a user exit module then disables that user exit module from being executed again. This option is primarily provided for JES3 support, but could be used for one time loading of tables, etc.

Note: When specifying return codes, enter any combination of the following values separated by blanks or commas:

- 0,4,8,12,16,20,24,28,32,36,40,44
- ANY
- GE255
- LT255
- NONZERO
- NONE

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MVS User Exit Modules

The following panel is displayed when the **U** line command is entered for an MVS user exit point.

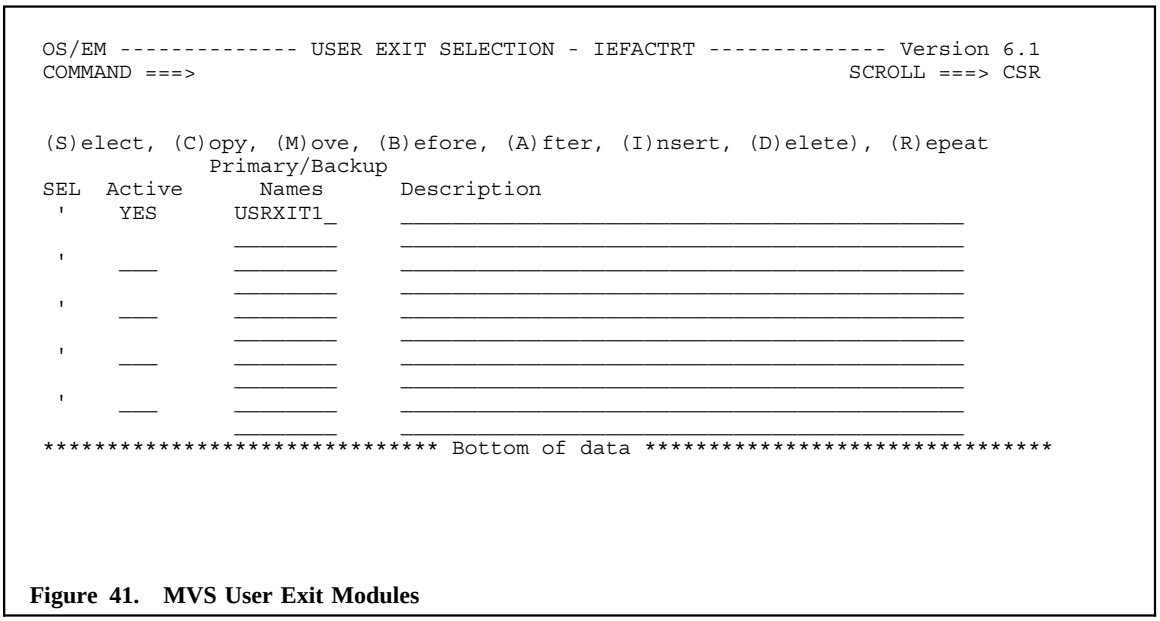

Figure 41. MVS User Exit Modules

This panel displays the modules defined for the selected MVS exit point. The user can add & delete modules entries, update entries and change the execution sequence of the user exit modules.

Line commands are:

S Select a user exit module entry

This function displays the user exit module field entry panel and allows the user to modify the definition parameters for that module.

"MVS User Exit Module Definition" on page 4-23 documents the resulting panel(s) and actions for this selection.

I Insert entry

This function adds an empty module entry immediately following the specified entry. This blank entry can then be defined by using the **S** line command to edit the module details.

D Delete entry

This function deletes the specified module entry.

C Copy entry

This function makes a copy of the specified entry. This line command is used in conjunction with the **A** and **B** line commands to control the location of the copied entry.

M Move entry

This function relocates the specified entry within the module selection list. This line command is used in conjunction with the **A** and **B** line commands to control the new location of the moved entry.

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R Repeat entry

This function duplicates the specified entry and inserts it immediately following the specified entry.

A Locate **AFTER**

This function locates a copied/moved entry immediately after the selected entry.

B Locate **BEFORE**

This function locates a copied/moved entry immediately before the selected entry.

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MVS User Exit Module Definition

The following panel is displayed when the **S** line command is entered in the MVS User Exit Module display panel.

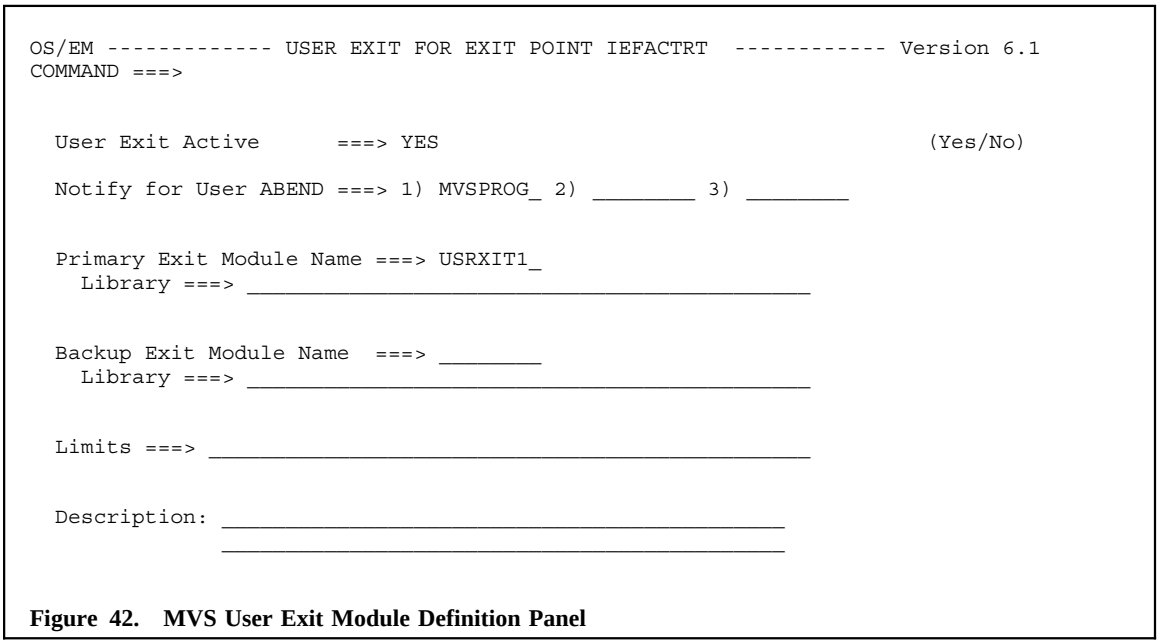

Figure 42. MVS User Exit Module Definition Panel

This field entry panel defines the characteristics of the user exit module to be executed.

1. User Exit Active

   YES - the defined MVS exit module will be loaded at IPL time and executed when the exit is driven.

   NO - the defined MVS exit(s) will not be loaded or executed.

2. Notify for User Exit ABEND

   Enter up to three **TSO User IDs** or **Notify Group Names** to be notified if an ABEND occurs in the defined user exit module for this MVS exit point.

3. Primary User Exit - this is the user exit module to be executed when the MVS exit is driven.

   a. Module Name - the name of the load module (or alias) to be executed.
   b. Entry Point - the name of the load module entry point to be used.
   c. Library - if the load module does not reside in a library defined in the system's LINKLIST, you may specify the name of the load library dataset. The dataset name with single quotes (') and the library must be APF authorized.

      Note: If a library is specified and the load module is not found in that library, OS/EM will not continue to search for the module and it will not be loaded.

4. Backup User Exit - this user exit module (if specified) will be used in the event that an ABEND occurs in the primary module.

   a. Module Name - the name of the load module (or alias) to be executed.
   b. Entry Point - the name of the load module entry point to be used.
   c. Library - if the load module does not reside in a library defined in the system's LINKLIST, you may specify the name of the load library dataset. The dataset name with single quotes (') and the library must be APF authorized.

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Note: If a library is specified and the load module is not found in that library, OS/EM will not continue to search for the module and it will not be loaded.

5. Limits

   This field allows the execution of the user exit module to be restricted to specific jobnames and/or jobname masks. Multiple names or masks should be separated by spaces.

   This is particularly useful for limiting the scope of an exit module while it is being tested by restricting its execution to specific test jobs. When the module is to be put into production, the execution of the exit can be made global by removing the jobname limits.

   Note: If the exit point does not support limits this field will be locked and no entry will be allowed.

6. Description

   This fields provides an area to document the function of the user exit module.

Limit Masking

Job Name Masks: The following table shows the allowable mask characters:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

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Extended OS/EM Functions

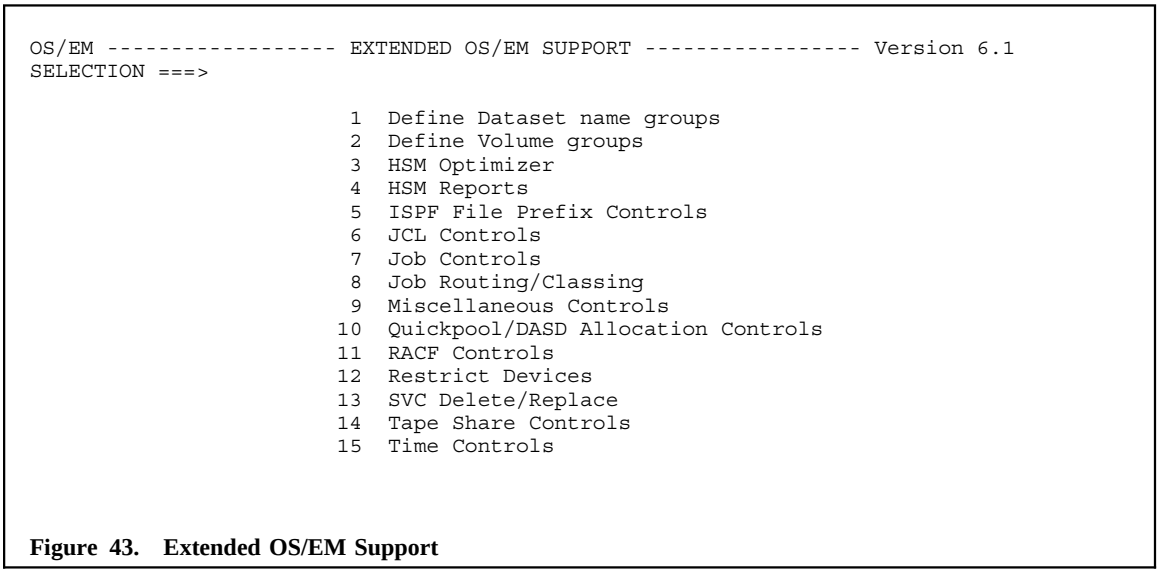

Figure 43. Extended OS/EM Support

Each of these paths is presented in the following sections:

1. Define Dataset Name Groups (see “Define Dataset Name Groups” on page 5-3)
2. Define Volume Groups (see “Define Volume Groups” on page 5-12)
3. HSM Optimizer (see “HSM Optimizer” on page 5-18)
4. HSM Reports (see “HSM Optimizer Report System” on page 5-59)
5. ISPF File Prefix Controls (see “ISPF File Prefix Controls” on page 5-111)
6. JCL Controls (see “JCL Controls” on page 5-113)
7. Job Controls (see “Job Controls” on page 5-144)
8. Job Routing/Classing (see “Job Routing Controls” on page 5-178)
9. Miscellaneous Controls (see “Miscellaneous Controls” on page 5-198)
10. QuickPool (see “QuickPool” on page 5-215)
11. RACF Controls (see “RACF Controls” on page 5-224)
12. Restrict Devices (see “Restrict Devices” on page 5-229)
13. SVC Delete/Replace (see “SVC Controls” on page 5-231)
14. Tape Share Controls (see “Tape Share Controls” on page 5-234)

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15. Time Controls (see “Time Controls” on page 5-240)

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Define Dataset Name Groups

Dataset Name Groups are used to establish a list of dataset name mask(s) and/or dataset name(s). The group names are then used in various OS/EM functions instead of specifying the same dataset name or masks(s) in every function.

Build groups as needed. A dataset name or mask(s) may appear in more than one group since each OS/EM function will use Dataset Name Groups in a different way.

This dialog displays the list of Dataset Name Groups and provides the functions to create new groups as well as maintain and delete existing groups.

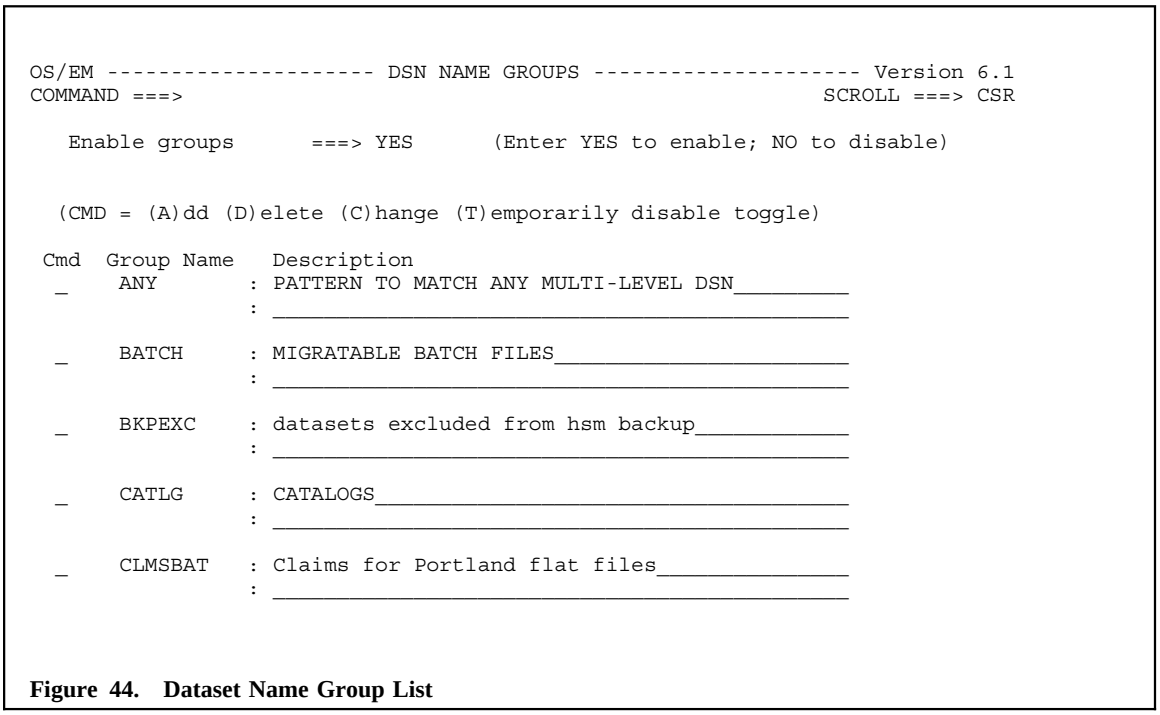

Figure 44. Dataset Name Group List

This panel displays the Dataset Groups that are currently defined to the OS/EM system. The PF7 & PF8 keys can be used to scroll up & down the list of groups.

Creating Group Names

Group Names are a maximum of eight characters in length, and may not start with the letters **NO**.

Each Group Name represents a group of one or more dataset names and/or mask(s). Dataset group names are used wherever OS/EM Extended Functions (such as the HSM Optimizer Direct to ML2 function) can use dataset name groups for its INCLUDE option.

There is no practical limit to the number of dataset name groups that may be created; especially since the groups may consist of dataset name(s)/mask(s) that represent a subset of your installation's total number of datasets.

It is suggested that you develop a naming scheme which will give some indication as to the dataset name group's use.

Note: Groups are stored internally in alphabetical order. Keep this in mind when creating group names. The OS/EM initialization member will also be built in alphabetic order. This determines OS/EM's search order when going through the dataset name(s) and mask(s) in each group to find a match. Dataset name(s)

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and mask(s) are searched in the order entered within the Dataset Name Group list. The first match that OS/EM finds will be the one used.

Panel Input Fields

1. **Panel Command Line** - see “Entering data” on page 2-1 for more information regarding ISPF commands.

2. **Enable Groups**

   YES The Dataset Groups function is enabled and the defined groups are available to the OS/EM extended functions.

   NO The Dataset Groups function is disabled.

3. **Line Commands**

   A - Add a Dataset Group (see “Add a DSN Group” on page 5-5)

   C - Change the Dataset Group (see “Change a DSN Group” on page 5-6)

   D - Deletes the Dataset Group (see “Delete a DSN Group” on page 5-7)

   T - Toggles the Dataset Group to/from being temporarily disabled (see “Temporarily Disable a DSN Group” on page 5-9)

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Add a DSN Group

The following screen is displayed when the line command **A** (Add a group) is entered in the DSN Name Group panel or if the Define DSN Groups function is entered and no groups are currently defined.

```
OS/EM --------------------- DSN NAME GROUPS -------------------- Version 6.1
COMMAND ===>


 Enter DSN Group Name and optional Description


 Group Name  ===>            (Enter DSN Group Name)

 Description ===> _____________________________________________
                  _____________________________________________
```

Figure 45. DSN Name Groups - Add Group Name

1. Group Name

   This is the name of the group to be defined. The group name can be up to 8 characters in length and must not start with **NO**. See **Creating Group Names** earlier in this section for more details about selecting a Dataset Group name.

2. Description

   This optional field provides an area for the user to provide comments relating to the group.

When the **ENTER** key is pressed, the Change Group panel is displayed (see Figure 46 on page 5-6). This allows the user to define the dataset name(s) and mask(s) which will constitute the group.

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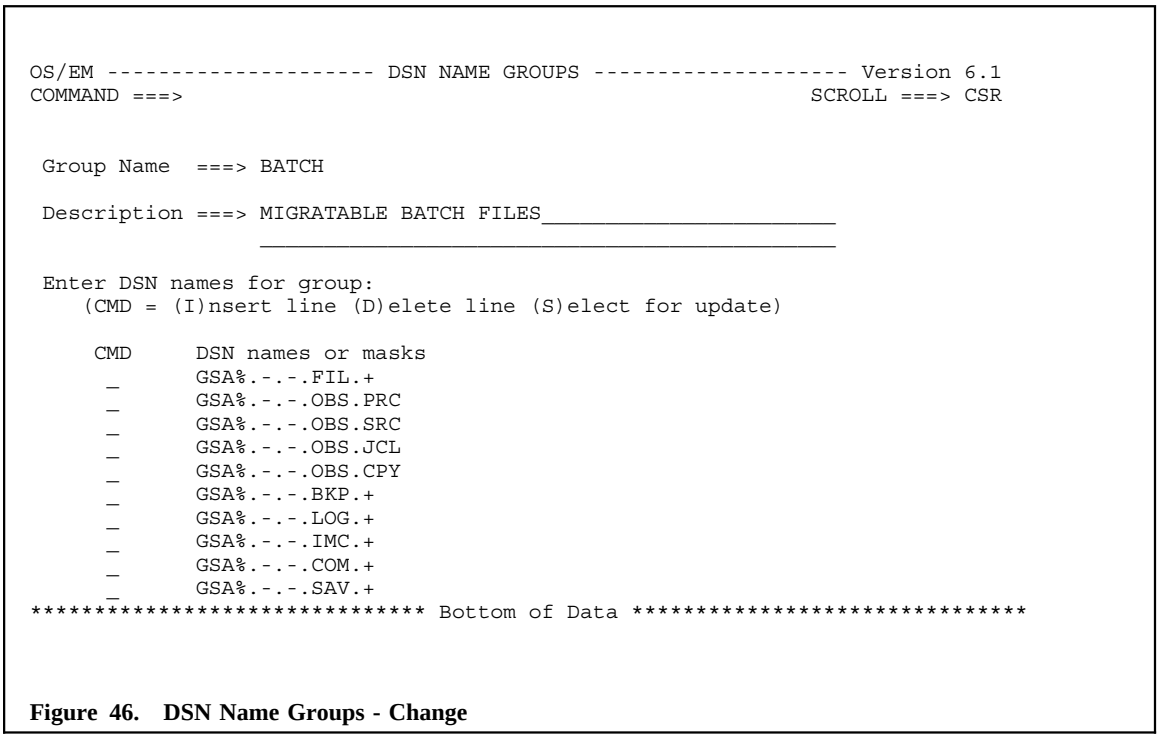
Change a DSN Group

The following panel is displayed in response to the **C**hange and **A**dd (after Dataset group is defined) line commands. This panel which will allow you to change the group description and to change, add and delete dataset name(s) and mask(s) for the group.



```
OS/EM --------------------- DSN NAME GROUPS -------------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


 Group Name  ===> BATCH

 Description ===> MIGRATABLE BATCH FILES_____________________
                  ____________________________________________

 Enter DSN names for group:
    (CMD = (I)nsert line (D)elete line (S)elect for update)

     CMD     DSN names or masks
      _      GSA%.-.-.FIL.+
      _      GSA%.-.-.OBS.PRC
      _      GSA%.-.-.OBS.SRC
      _      GSA%.-.-.OBS.JCL
      _      GSA%.-.-.OBS.CPY
      _      GSA%.-.-.BKP.+
      _      GSA%.-.-.LOG.+
      _      GSA%.-.-.IMC.+
      _      GSA%.-.-.COM.+
      _      GSA%.-.-.SAV.+
****************************** Bottom of Data ******************************
```

Figure 46. DSN Name Groups - Change

The change panel contains a scrollable area where the dataset name(s) or mask(s) are maintained. Each row consists of a single dataset name or mask.

The following line commands can be used:

D - Delete the entry

I - Insert a new dataset name / mask immediately following the selected line.

S - Select the entry for update. The dataset name / mask can be modified prior to pressing ENTER.

You may NOT change the group name. If you wish to change the name, you must create a new group with the desired name and enter all the dataset name(s) and mask(s) that will constitute the group. Delete the old group once the new group is active.

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Delete a DSN Group

A dataset group is deleted by entering a **D** line command next to the desired group.

The group, and all the dataset name(s) and mask(s) comprising the group, will be deleted. OS/EM will check that the group is not referenced in any function and will not delete the group if it is, however no checks are made to determine whether the group is still referenced within an OS/EM initialization member. Initialization will produce undesired results if undefined Dataset Name Groups are referenced.

A series of panels will display after a group has been selected for deletion. These panels will are as follows:

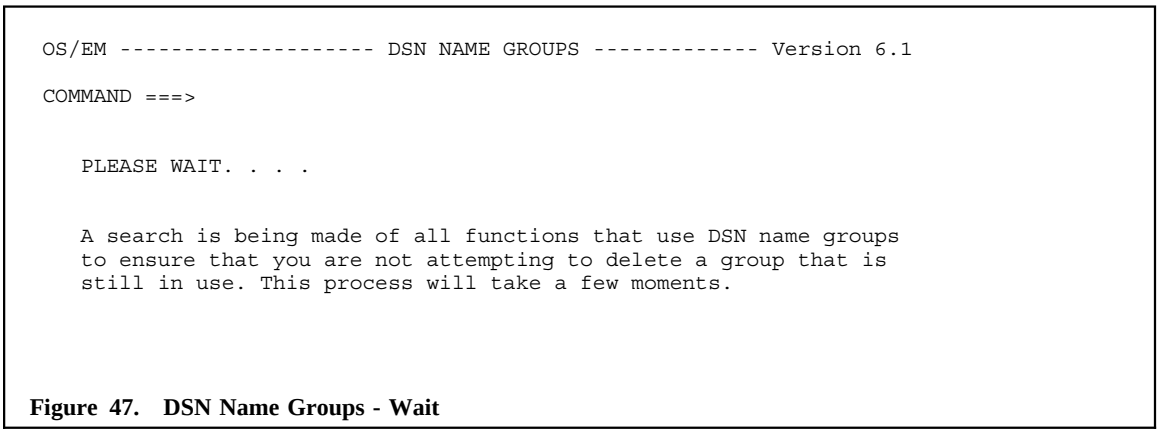

Figure 47. DSN Name Groups - Wait

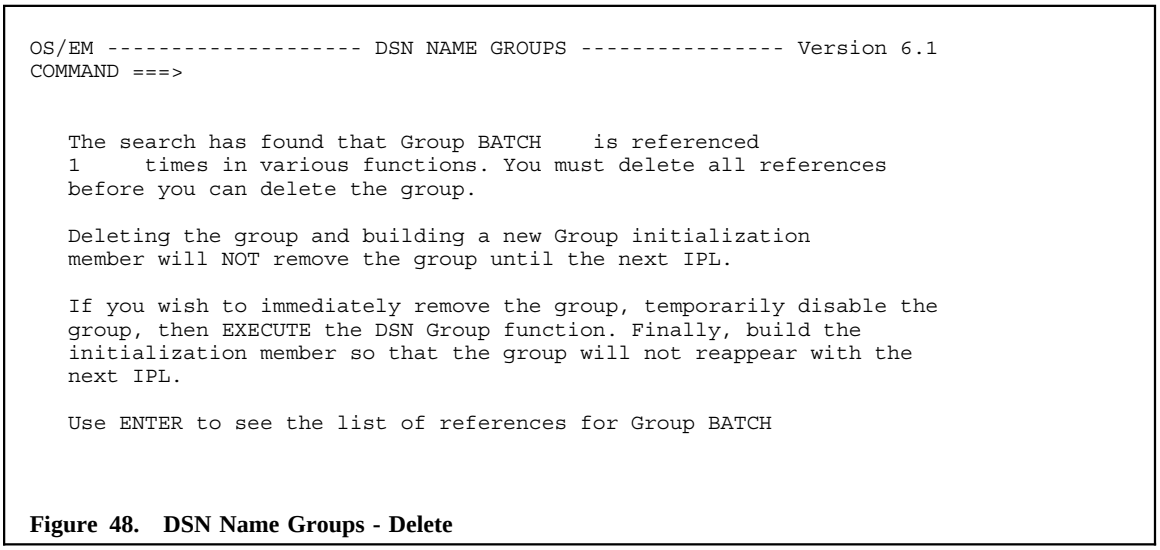

Figure 48. DSN Name Groups - Delete

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```
OS/EM -------------------- DSN NAME GROUPS ---------------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


   Group BATCH    is referenced in the following functions:

         QUICKPOOL: POOL NAME IS VOLG15, POOL TYPE IS ALLOW
******************************** BOTTOM OF DATA ********************************
```

Figure 49. DSN Name Groups - References

```
OS/EM -------------------- DSN NAME GROUPS --------------------- Version 6.1
COMMAND ===>


   The search has found no references to Group BATCH2.

   Deleting the group and building a new Group initialization
   member will NOT remove the group until the next IPL.

   If you wish to immediately remove the group, temporarily disable the
   the group, then EXECUTE the  Group function. Finally, build the
   initialization member so that the group will not reappear with the
   next IPL.

   Use ENTER to continue, or use CANCEL to quit.
```

Figure 50. DSN Name Groups - No References

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Temporarily Disable a DSN Group

A dataset group may be temporarily disabled by entering a **T** in line command field before the desired group entry. The group definition will be retained but none of the dataset name(s) within the group will be available for OS/EM processing.

Disabled groups are indicated by a **T** immediately to the left of the group name. These groups may be enabled by entering a **T** in the line command field. The **T** line command acts as a disable/enable toggle.

While the definition is retained, the same considerations apply as if the group were being deleted (see "Delete a DSN Group" on page 5-7).

As with all changes in the interface, you must remember to execute this change online for it to take effect.

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Dataset Name Masks

Dataset name masks are created by using qualifiers within a dataset name. Valid qualifiers are:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The minus sign is used to unconditionally match a single node of the dataset name. Multiples are allowed.
+	The plus sign is used to unconditionally match all characters/nodes of the dataset name beyond where it is entered in the specification. A single plus sign may be specified.

Examples of dataset name masks

Example	***Explanation***
AA	Specifies single-level dataset AA
AA?AA	Specifies a single-level dataset name of five characters. The first and last two characters are AA. The third character can be anything: AA5AA,AABAA, etc.
AA+	Specifies any dataset name beginning with the two characters AA: AA55.TEST
AA-	Specifies a single-level dataset name beginning with the characters AA: AA5PROD
AA.+	Specifies a two or more level dataset name. The first node is AA: AA.PROD.COMP
AA.-	Specifies a two level dataset name. The first node is AA: AA.CICS
-.AA	Specifies a two level dataset name. The last node is AA: PROD.AA
SYS1.-.HRP1000	Specifies a three-level dataset name. The first node is SYS1 and the last node is HRP1000
-.-.-	Specifies any three-level dataset name. This type of specification will match every three-level dataset name within your installation.
GSAX.-.PRM	Specifies a three-level dataset name. The first node is GSAX and the last node is PRM.
SYS?.-	Specifies a two-level dataset name. The first node starts with SYS and any other character. The second node can be anything: SYS1.LINKLIB
SYS&.-	Specifies a two-level dataset name. The first node starts with SYS and any other alphabetic character. The second node can be anything: SYSX.LINKLIB
SYS%.-	Specifies a two-level dataset name. The first node starts with SYS and any other numeric character. The second node can be anything: SYS5.LINKLIB

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SYSX.-.EZT??? Specifies a three-level dataset name. The first node is SYSX. The second node can be anything. The third node begins with EZT and any three characters: SYSX.CICS.EZT030

??SYSUT?.+ Specifies a two or more level dataset name. The first node begins with any two characters, followed by SYSUT and any other single character.

AA.+.BB Specifies a three or more level dataset name. The first node is AA and the last node is BB.

AA+AA Specifies a single-level dataset name. The first two characters are AA and the last two characters are AA. The up to four middle characters can be anything. There has to be at least one middle character - AAAA will not match.

SYSX.PROCLIB
A fully qualified dataset name.

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Define Volume Groups

Volume name groups are used to establish a list of DASD volumes. These group names are then used in various OS/EM Extended Functions instead of specifying the same volume serial numbers in every function.

Build groups as needed. A volume serial number may appear in more than one group since each OS/EM Extended Function will use volume serial numbers in a different way.

This dialog displays the list of Volume Groups and provides the functions to create new groups as well as maintain and delete existing groups.

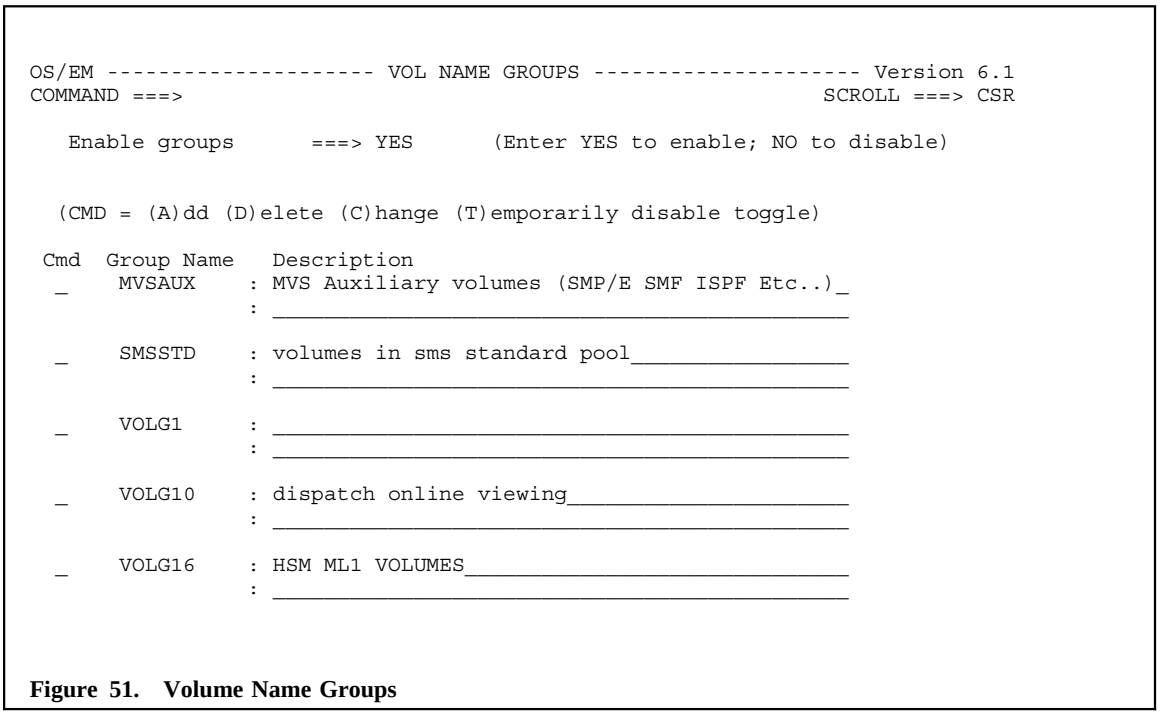

Figure 51. Volume Name Groups

This panel displays the Volume Groups that are currently defined to the OS/EM system. The PF7 & PF8 keys can be used to scroll up & down the list of groups.

Creating Group Names

Group Names are a maximum of eight characters in length, and may not start with the letters **NO**.

Each Group Name represents a group of one or more DASD volumes. Masking characters may be used to define a generic range of volumes (see “Volume Masks” on page 5-17 for more information on volume name masking). Volume group names are used wherever OS/EM Extended Functions (such as the HSM Optimizer defragmentation function) may require volume names on which to operate.

There is no practical limit to the number of volume groups that may be created; especially since groups may consist of volume serial mask(s) that represent a subset of your installation's total number of volumes.

It is suggested that you develop a naming scheme which will give some indication as to the volume group's use.

Note: Groups are stored internally in alphabetical order. Keep this in mind when creating group names. The OS/EM initialization member will also be built in alphabetic order. This determines OS/EM's search order when going through the volume name(s) and mask(s) in each group to find a match. Volume

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name(s) and mask(s) are searched in the order entered within the Volume Group list. The first match that OS/EM finds will be the one used.

Panel Input Fields

1. **Panel Command Line** - see “Entering data” on page 2-1 for more information regarding ISPF commands.

2. **Enable Groups**

   YES The Volume Groups function is enabled and the defined groups are available to the OS/EM extended functions.

   NO The Volume Groups function is disabled.

3. **Line Commands**

   A - Add a Volume Group (see “Add a Volume Group” on page 5-14)

   C - Change the Volume Group (see “Change a Volume Group” on page 5-15)

   D - Deletes the Volume Group (see “Delete a Volume Group” on page 5-16)

   T - Toggles the Volume Group to/from being temporarily disabled (see “Temporarily Disable a Volume Group” on page 5-16)

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Add a Volume Group

The following screen is displayed when the line command **A** (Add a group) is entered in the Vol Name Group panel or if the Define Volume Groups function is entered and no groups are currently defined.

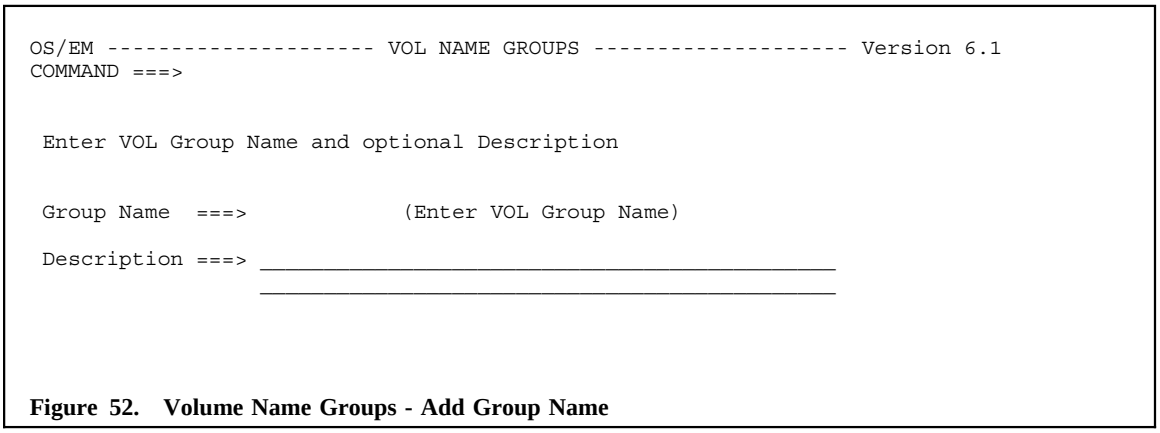

Figure 52. Volume Name Groups - Add Group Name

1. Group Name

   This is the name of the group to be defined. The group name can be up to 8 characters in length and must not start with **NO**. See **Creating Group Names** earlier in this section for more details about selecting a Volume Group name.

2. Description

   This optional field provides an area for the user to provide comments relating to the group.

When the **ENTER** key is pressed, the Change Group panel is displayed (see Figure 53 on page 5-15). This allows the user to define the volume name(s) and/or mask(s) which will constitute the group.

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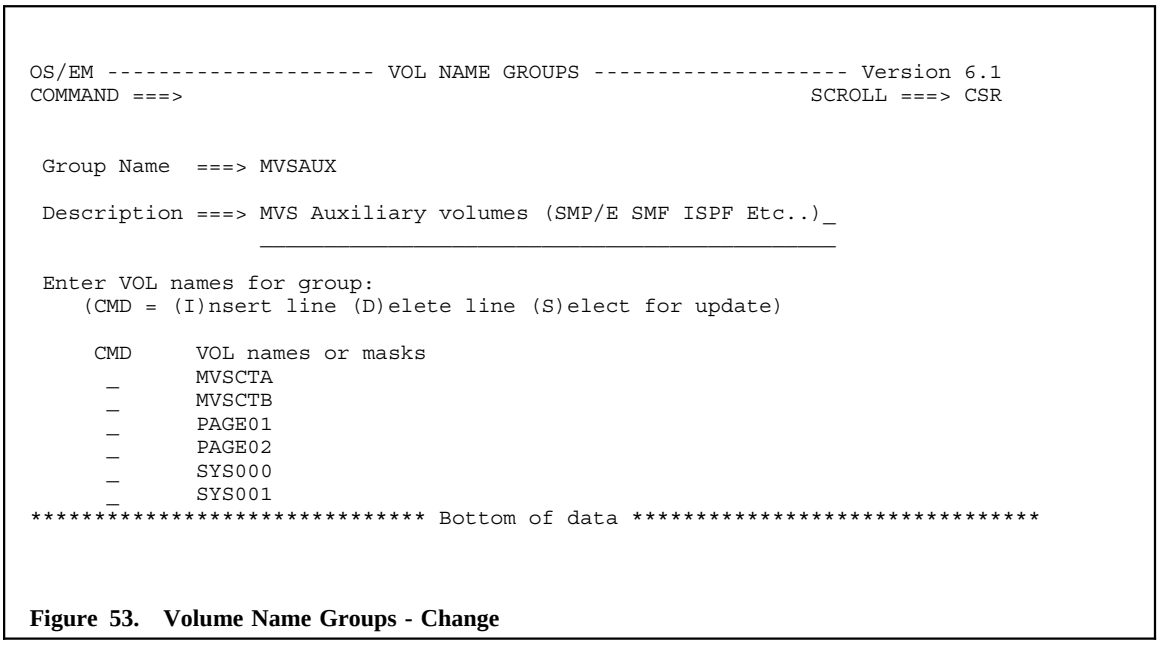
Change a Volume Group

The following panel is displayed in response to the **C**hange and **A**dd (after Volume group is defined) line commands. This panel which will allow you to change the group description and to change, add and delete volume name(s) and mask(s) for the group.



```
OS/EM --------------------- VOL NAME GROUPS -------------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


 Group Name  ===> MVSAUX

 Description ===> MVS Auxiliary volumes (SMP/E SMF ISPF Etc..)_
                  ____________________________________________

 Enter VOL names for group:
    (CMD = (I)nsert line (D)elete line (S)elect for update)

     CMD     VOL names or masks
      _      MVSCTA
      _      MVSCTB
      _      PAGE01
      _      PAGE02
      _      SYS000
      _      SYS001
****************************** Bottom of data ********************************
```

Figure 53. Volume Name Groups - Change

The change panel contains a scrollable area where the volume name(s) or mask(s) are maintained. Each row consists of a single volume name or mask.

The following line commands can be used:

D - Delete the entry

I - Insert a new volume name / mask immediately following the selected line.

S - Select the entry for update. The volume name / mask can be modified prior to pressing ENTER.

You may NOT change the group name. If you wish to change the name, you must create a new group with the desired name and enter all the volume name(s) and mask(s) that will constitute the group. Delete the old group once the new group is active.

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Delete a Volume Group

A Volume Group is deleted by entering a **D** line command next to the desired group.

The group, and all the volume name(s) and mask(s) comprising the group, will be deleted. OS/EM will check that the group is not referenced in any function and will not delete the group if it is, however no checks are made to determine whether the group is still referenced within an OS/EM initialization member. Initialization will produce undesired results if undefined Volume Name Groups are referenced.

A series of panels will display after a group has been selected for deletion. These panels will are as follows:

Delete a complete volume group by entering a **D** in the CMD field before the group.

The group, and all the dataset names and masks comprising the group, will be deleted. OS/EM will check that the group is not referenced in any other panel and will not delete the group if it is, however no checks are made to determine whether the group is still referenced within OS/EM initialization member. Initialization will produce undesired results if undefined Volume Groups are referenced.

Temporarily Disable a Volume Group

A volume group may be temporarily disabled by entering a **T** in line command field before the desired group entry. The group definition will be retained but none of the volume name(s) within the group will be available for OS/EM processing.

Disabled groups are indicated by a **T** immediately to the left of the group name. These groups may be enabled by entering a **T** in the line command field. The **T** line command acts as a disable/enable toggle.

While the definition is retained, the same considerations apply as if the group were being deleted (see “Delete a Volume Group”).

As with all changes via the interface, you must remember to execute the change online to have it take effect.

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Volume Masks

Volume masks are created by using qualifiers within a volume serial number. Valid qualifiers are:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

Examples of volume serial number masks

Example
Explanation

VOL0%%
Matches any serial number that begins with VOL0 and any two numeric characters: VOL010

&%%%%%
Matches any serial number that begins with any alpha character and five numbers

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HSM Optimizer

Description

The HSM Optimizer allows you to more precisely control DFHSM migration and backup. DFHSM as supplied by IBM in both SMS and Non-SMS environments provides a limited set of specifications in determining which datasets will, or will not, be migrated or backed up. Complete volumes may be excluded, datasets may be excluded from migration, and a residency factor (the number of days since last reference) may be specified. The HSM Optimizer, in contrast allows multiple residency specifications, the dataset size as a factor at migration time versus allocation time in DFSMS, and a relationship between a dataset's size and specification in a dataset name list.

Summary of Features

- Provide a default DSORG for all datasets allocation so that DFHSM can manage all datasets
- Global rules for Migration from Primary volumes to Migration Level 1 for DFSMS environments based on dataset size at migration time
- Global rules for Migration from Migration Level 1 to Migration Level 2 for DFSMS environments based on dataset size at migration time
- Global rules for Direct Migration from Primary volumes to Migration Level 2 for DFSMS environments based on dataset size at migration time
- Eliminates DFHSM Error messages by allowing simple lists of dataset name(s) or dataset name mask(s) to be entered for exception processing. i.e. Exclude dataset name(s) or dataset name mask(s) for datasets that are always open during DFHSM daily migration or backup processing
- Automatic defragmentation of Primary volumes based on fragmentation index, time of day, day of week, and volume serial for Non-SMS and DFSMS environments
- Direct Migration from Primary volumes to Migration Level 2 based on dataset size and/or dataset name at migration time versus DFSMS at allocation time
- Migration from Primary volumes to Migration Level 1 refused for datasets based on dataset size and/or dataset name at migration time versus DFSMS at allocation time
- Migration from Migration Level 1 to Migration Level 2 refused for datasets based on dataset size and/or dataset name at migration time versus DFSMS at allocation time
- Exclude datasets from DFHSM back up in a Non-SMS or DFSMS environment
- Optimum Re-blocking of recalled datasets, and exclusion of datasets to be Re-blocked based on dataset size and/or dataset names
- Residency specified at the dataset level for Non-SMS environments
- Ability to prioritize batch and online recall and recover requests.
- Ability to initiate batch recalls when the job goes through conversion and to optionally hold the job in the input queue until recalls have completed.

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HSM Optimizer Menu

DFHSM, as currently supplied by IBM, offers only coarse control over which datasets get migrated and backed up. Only one aging factor may be supplied, and this factor applies to all datasets, except those explicitly excluded from processing. If your installation has a very aggressive aging factor, say only one or two days, and a high percentage factor for migration 'kick-in', datasets will be continually migrated and recalled, with no regard to their usage or size. Further, the same sort of factors apply to DFHSM's Level-1 storage. If your Level-1 storage is on the small side and a large dataset migrates, you might find that many of your recalls will be coming from Level-2 storage. If this level is tape, there will be delays while the tape is found and mounted.

The HSM Optimizer has been designed to give you much finer control over the migration and backup process. It also gives you the option to reblock datasets when they are recalled, and to automatically defragment DASD volumes based on supplied criteria. The following details the HSM Optimizer's functions (it is assumed that you have some familiarity with DFHSM processing and the setting of options in the ARCCMDxx parm member):

- The HSM Optimizer's basic control mechanism is the HOLD day, the amount of time a dataset must remain unreferenced before it is eligible for processing. Multiple HOLD days are supplied for every DFHSM process that ages datasets before processing. You are given choices of 1-10 days, 15-50 days by 5 day increments, and 60-90 days in 10 day increments. You may also choose 9999 as an aging factor which, effectively, holds a dataset indefinitely.

- Dataset size may be specified. Depending on the function, this is either a maximum dataset size which datasets have to be less than or equal to, or it is a minimum size that datasets must exceed or be equal to before being selected for processing.

- A list of datasets that are always to be included, or excluded, from processing may be specified. These lists are formed by specifying the appropriate data set name groups.

- A connection between dataset size and a dataset being in an included or excluded list may be established, further refining the selection process.

- Datasets may be reblocked during the recall process. Full through eighth track blocking is supported, along with system reblocking if your installation has the correct level of DFP installed.

- Automatic defragmentation of your DASD volumes may be done by setting fragmentation levels and assigning volumes to one of eight different pools.

- A reporting system is furnished which should help you in determining the proper HSM Optimizer controls for your installation.

We recommend that you run the report system before attempting to specify any of the HSM Optimizer's controls. Once you have determined a strategy, implement it in phases. Also, to get the most effect from the HSM Optimizer, set DFHSM's aging factors to one day and specify a low THRESHOLD for the volumes, see Programmer's Guide. The HSM Optimizer only "sees" those datasets that DFHSM considers eligible for processing. By setting aggressive factors in your DFHSM ARCCMDxx parm member, you let the HSM Optimizer determine whether a dataset should be processed. Consider, too, removing all specifications for datasets that you currently set as NOMIG or COMMANDMIGRATION via the SETMIG statement. Handle such datasets via the HSM Optimizer. This will place all DFHSM control in one place.

Directed Recall requires that the following DFHSM SETSYS option be present in DFHSM ARCCMDxx member.

```
SETSYS RECALL(PRIVATE(UNLIKE))
```

Note: If the dataset is a DFSMS dataset this option will not be invoked. If QUICKPOOL allocation is in effect, you must specify DIRECTRECALL. DFHSM RECALL/RECOVERY will most likely fail if this option is not enabled.

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```
OS/EM ----------------------  HSM OPTIMIZER --------------------- Version 6.1
COMMAND ===>

                      1 - Backup Control
                      2 - Defragmentation Control
                      3 - Delete-By-Age Control
                      4 - Delete-If-Backed-Up Control
                      5 - Direct to Level-2 Control   (ML0 -> ML2)
                      6 - Early Batch Recall          (JES2)
                      7 - Force DSORG to PS
                      8 - Migration Control           (ML0 -> ML1)
                      9 - Migration Level-2 Control   (ML1 -> ML2)
                     10 - Prioritize Recall/Recover Requests
                     11 - Quick Delete Control
                     12 - Reblocking Control
                     13 - Recall/Recover Volume Selection Control
```

Figure 54. HSM Optimizer Menu

Each of the Optimizer's functions is detailed in the following sections. Many of the panels are repetitious. For example, any function that is driven by a dataset group list has a panel on which you specify the dataset name groups. The interface presents this panel, with an appropriate title, for each function; but the panel will be detailed only once.

Each of these paths is presented in the following sections:

1. Backup Control (see “Backup Control” on page 5-21)
2. Defragmentation Control (see “Defragmentation” on page 5-23)
3. Delete-By-Age Control (see “Delete-by-Age Control” on page 5-28)
4. Delete-If-Backed-Up Control (see “Delete-if-Backed-Up Control” on page 5-31)
5. Direct to Level-2 Control (see “Direct-to-Level-2 Control” on page 5-34)
6. Early Batch Recall (see “Early Batch Recall” on page 5-36)
7. Force DSORG to PS (see “Force DSORG to PS” on page 5-38)
8. Migration Control (see “Migration Control (ML0-ML1)” on page 5-39)
9. Migration Level-2 Control (see “Migration Level-2 Control (ML1-ML2)” on page 5-42)
10. Prioritize Recall/Recover Requests (see “Prioritize Recall/Recover Requests” on page 5-46)
11. Quick Delete Control (see “Quick Delete Control” on page 5-54)
12. Reblocking Control (see “Reblocking Control” on page 5-55)
13. Recall/Recover Volume Selection Control (see “Recall/Recover Volume Selection” on page 5-58)

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Backup Control

Backup control allows you to specify datasets which should not be backed up. DFHSM processing will back up every dataset that has changed or is new. Many installations have datasets that are created, used, and overwritten the next time they are used. There really is no need to back up such datasets.

The first panel presented (Figure 55) allows you to ENABLE or DISABLE backup control. You also specify whether any EXCLUDE dataset name group list(s) will be a part of backup processing.

The EXCLUDE list consists of previously defined dataset name groups. Any dataset that can be resolved to a group on the list will NOT be backed up. Be careful that datasets you are excluding should not be backed up. Note that the displayed description is the description you entered, if any, when you created the dataset name group. It is displayed here for documentation purposes.

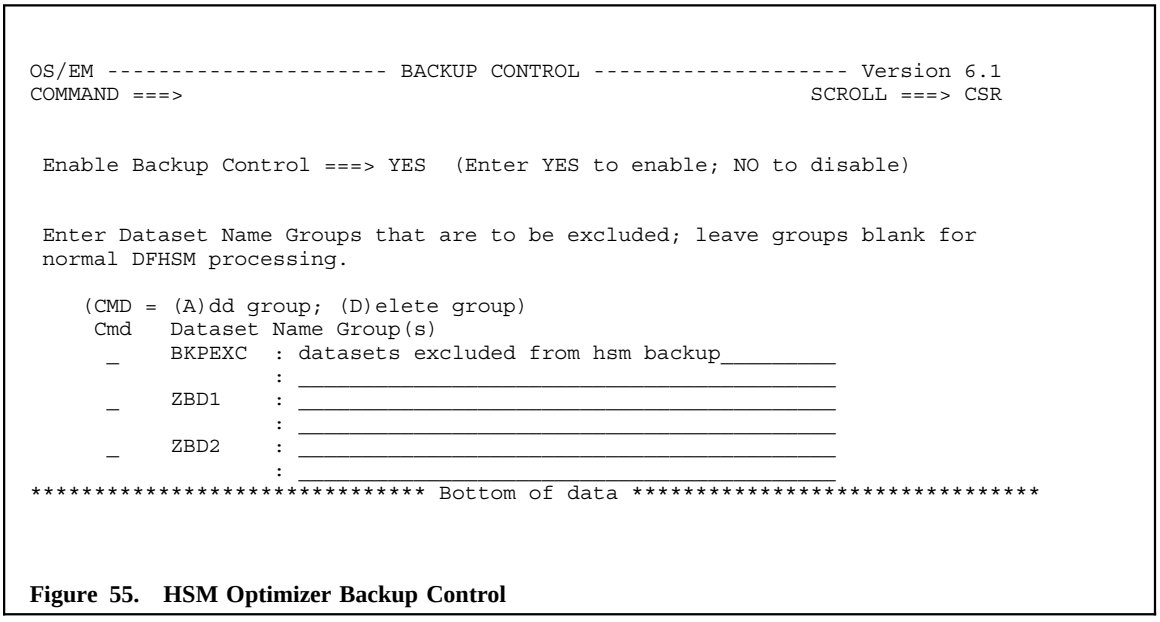

Figure 55. HSM Optimizer Backup Control

Field entry is as follows:

1. Enable Backup Control

   Entering **YES** in this field will enable OS/EM's extended processing.

   Entering **NO** will disable this function.

2. Exclude Dataset Name Groups

   The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

   Group names are up to eight characters in length. They are created by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

   Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

   To add a dataset name group, enter an **A** in the CMD field and **overtype the name of the dataset name group** in the group field (overtyping will not alter the old entry).

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If you enter a group name which does not exist, a popup window (see Figure 56 on page 5-22) will be displayed which lists all available groups. Use the 'S' line command to select as many groups as needed.

Note: The initial display of the Group Selection List will be positioned to the closest match for the name you tried to enter. Use the Up and Down scroll PF keys to reposition the display.

To delete an existing entry, enter a **D** in the CMD field.

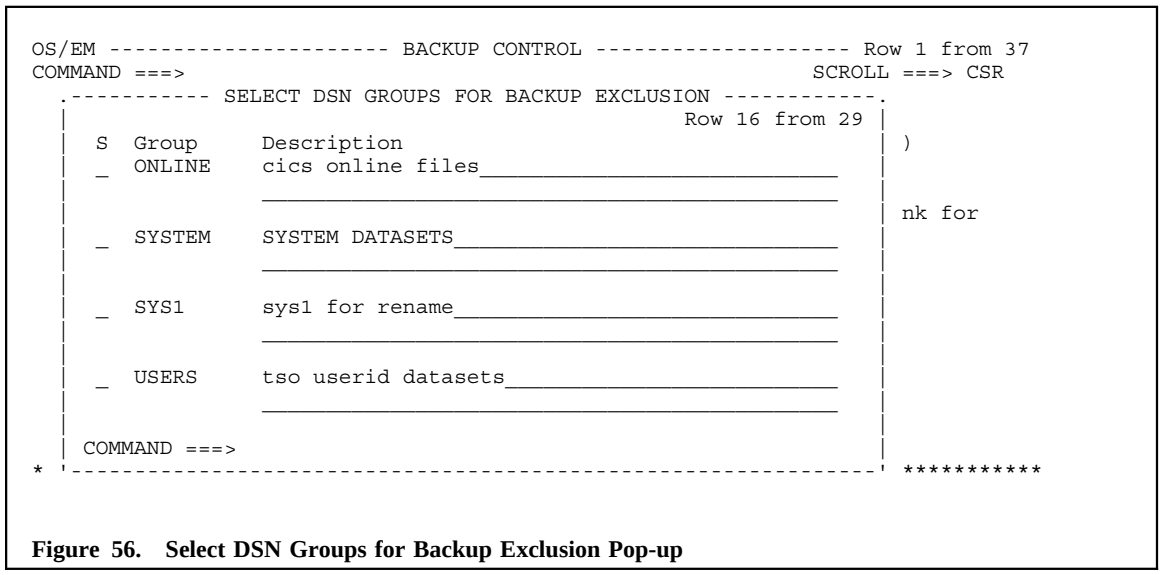

Figure 56. Select DSN Groups for Backup Exclusion Pop-up

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Defragmentation

OS/EM's Defragmentation control automates the "compaction" of DASD volumes.

DASD volumes become fragmented over time. This can eventually lead to allocation failure because, while the total free space on the volume may be adequate, too many secondary allocations would be required to satisfy an allocation request.

DFHSM returns a "fragmentation index" every time it does space management on a volume. OS/EM uses this index, based on your specification, to determine when to issue a DFDSS defrag procedure.

Invoking the Optimizer's Defragmentation Control presents the following panel:

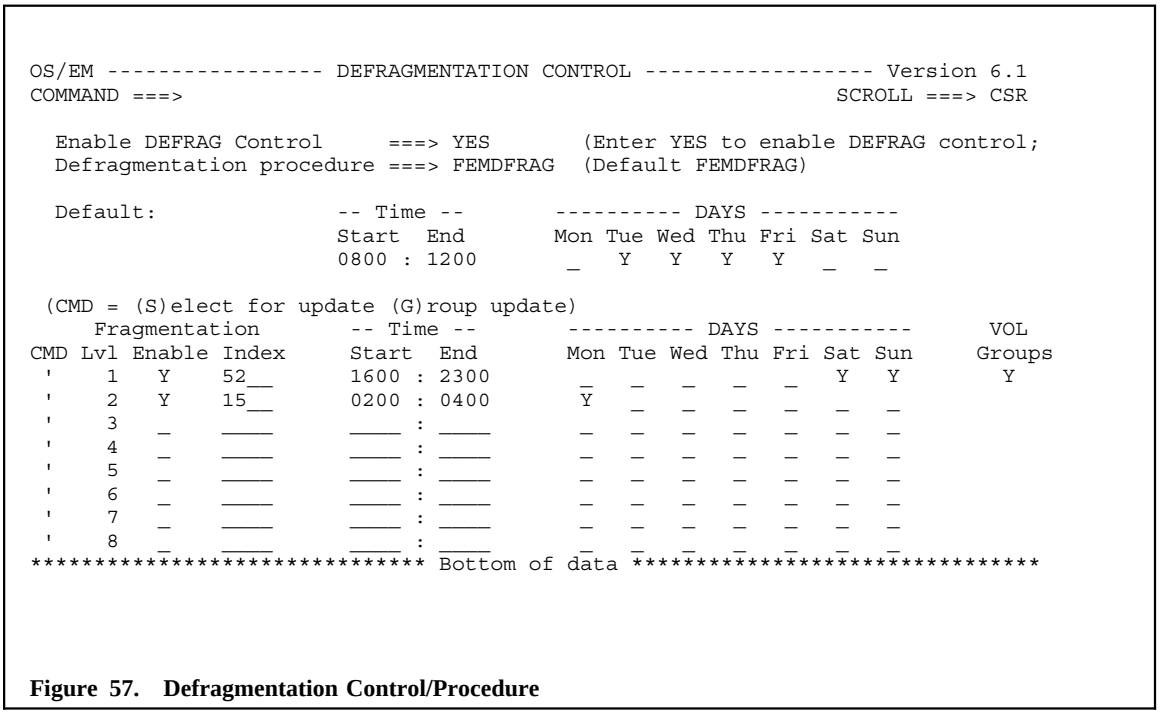

Figure 57. Defragmentation Control/Procedure

Field entry is as follows:

1. Enable DEFRAG Control

   Entering **YES** in this field will enable OS/EM's extended processing.

   Entering **NO** in this field will disable OS/EM's extended processing.

2. Defragmentation Procedure

   You may also specify the procedure name which will be used to start the DFDSS procedure which will actually defragment the DASD volume. The default name is FEMDFRAG. Any other procedure name can be specified. The procedure must exist in your installation's procedure library. Processing will not be affected if the procedure does not exist; however, the defragmentation process will not be done.

   The procedure should be a regular DFDSS defragmentation procedure. It must be created with a single symbolic parameter - V - which becomes the serial number of the volume to be defragmented (this may be passed in the PARM of the DFDSS EXECUTE statement). Each execution of the procedure will defragment a single volume. It is suggested that the executed procedure not actually be the DFDSS procedure, but a procedure which submits a batch job, with the appropriate parameter,

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that is the DFDSS defragment job. This will prevent your system from being flooded with many started tasks when a large number of volumes are being defragmented.

3. Default

   Setting Global Time values

```
Default:              -- Time --
                      Start  End
                      0900 : 1400
```

   Specifies the time of day during which OS/EM will issue the start for the defrag procedure. This time will apply to every defrag level which does not have its own time specification.

   The time is based on a 24 hour clock. The first time parameter specifies the earliest start time that the defrag procedure will be submitted; the second time parameter, the latest time that the defrag procedure will be submitted.

   For example, if you enter 0900 as the first time and 1400 as the second time, the defrag procedure will be submitted anywhere from 9AM to 2PM. The day of submission will depend on the DAYS that you specify.

   Setting Global Days values

```
Default:          ---------- DAYS -----------
                  Mon Tue Wed Thu Fri Sat Sun
                   Y   _   _   Y   _   Y   _
```

   Specifies the day(s) of the week on which OS/EM will issue the start for the defrag procedure. The day(s) will apply to any defrag level which does not specifically set its own days.

   Enter Y beneath the appropriate column for the desired day. Each day must be specifically entered. If you do not wish a particular day to be active, do not enter it.

   If you enter MON, THU, SAT, for example, the defrag procedure will be submitted on these days.

4. Defrag Levels

   Specify the defrag level you wish to customize by placing an **S** in the CMD column. Eight levels are available, each with its own fragmentation index, times, days, and list of volume groups. There is no inherent meaning to the level numbers.

   The defrag level parameter may be used in a couple of different ways. You may code all 8 levels with the same fragmentation index, but supply a different volume list for each level. This creates a series of volume pools that may be defragmented on different days of the week by specifying the proper TIME and DAY parameters. Using this technique enables you to defrag your volumes on a weekly basis, spreading the process throughout the week.

   The second method would be to code different fragmentation indexes for each level, specifying appropriate volumes and TIME and DAY parameters. This method allows you to defrag volumes based on their content and usage (i.e., some volumes may have large files allocated to them; therefore, you might want to defrag such volumes more frequently to minimize secondary allocation).

```
  (CMD = (S)elect for update (G)roup update)
     Fragmentation       -- Time --       ---------- DAYS -----------      VOL
CMD Lvl Enable Index     Start  End       Mon Tue Wed Thu Fri Sat Sun     Groups
 '    1   Y    350_      2300 : 0300       _   Y   _   Y   _   Y   _        Y
 '    2   _    ____      ____ : ____       _   _   _   _   _   _   _
```


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- Enable

  Enter a **Y** in the Enable column to turn on that level.

- Index

  Specify the fragmentation index that is to be used to determine whether a list of volumes should be defragmented. The number ranges from 0 (the default) to 999. A 0 implies that no defragmentation is to be done. 999 indicates that the volume is very fragmented: equivalent to half a volume's worth of one-track datasets placed on every other track.

  An appropriate initial value would be between 350 and 500. However, the value most appropriate to your installation must be determined by the type of datasets--large or small--on the volume, and the frequency of dataset allocation on the volume.

- Setting level time values

  Specifies the time of day during which OS/EM will issue the start for the defrag procedure. This time applies to the specific defrag level being configured.

  The time is based on a 24 hour clock. The first time parameter specifies the earliest start time that the defrag procedure will be submitted; the second time parameter, the latest time that the defrag procedure will be submitted.

  For example, if you enter 0400 as the first time and 1400 as the second time, the defrag procedure will be submitted anywhere from 4AM to 2PM. The day of submission will depend on the DAYS that you specify.

- Setting level days values

  Specifies the day(s) of the week on which OS/EM will issue the start for the defrag procedure. The day(s) will apply to the specific defrag level which is being configured.

  Enter **Y** beneath the appropriate column for the desired day. Each day must be specifically entered. If you do not wish a particular day to be active, do not enter it.

  If you enter MON, THU, SAT, for example, the defrag procedure will be submitted on these days.

- Include Volume Groups

  If you wish to INCLUDE a list of volume groups to limit the effect of the defrag level, enter **G** in the CMD field. The **Y** in the VOL Groups column will either appear or disappear based on whether you have an INCLUDE group.

  If no volume list is present for a defrag level, it is assumed that the level applies to ALL volumes.

  When you press the enter key after using the G line command, a pop-up window (see Figure 58 on page 5-26) will appear where you may specify the volume groups to be used for this defrag level.

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The following is an example of how to use levels.

LVL	Index	Time	Days	Volume Groups
1	400		SUN	VOLSUN
2	400		MON	VOLMON
3	400		TUE	VOLTUE
4	400		WED	VOLWED
5	400		THU	VOLTHU
6	400		FRI	VOLFRI
7	400		VOLSAT	
8	700	S=0100 E=0500	SUN MON TUE WED THU FRI SAT	VOLSUN VOLMON VOLTUE VOLWED VOLTHU VOLFRI VOLSAT

Table 1. Defrag Levels

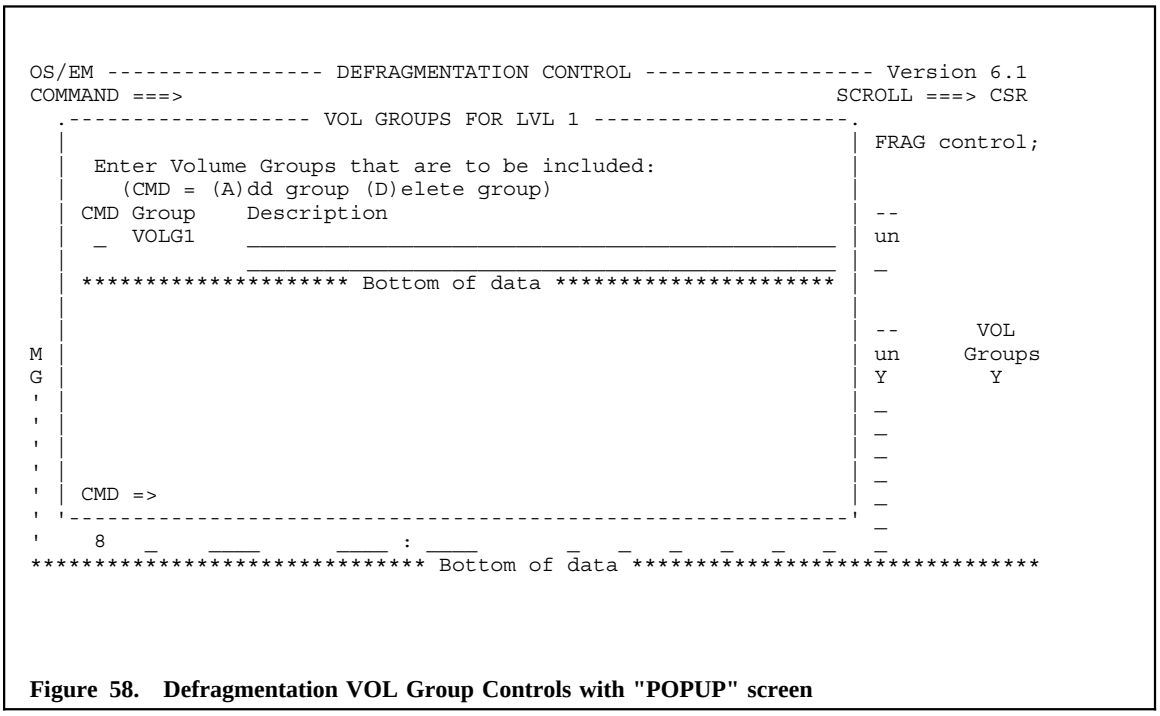

Figure 58. Defragmentation VOL Group Controls with "POPUP" screen

Use the "POPUP" panel to add or delete the VOL Groups.

The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

Group names are up to eight characters in length. Create them by using the Define Volume Groups function (see “Define Volume Groups” on page 5-12). Each group represents a set of volume serial masks or fully qualified volume serial numbers.

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The volume group names that you enter must have been properly defined by using the VOL function before they will be accepted on this panel.

To add a volume group, enter an **A** in the CMD field and the name of the volume group in the group field. Type a description of the group in the description field. Overtype any existing entry - the old entry will not be altered.

To delete an existing entry, enter a **D** in the CMD field.

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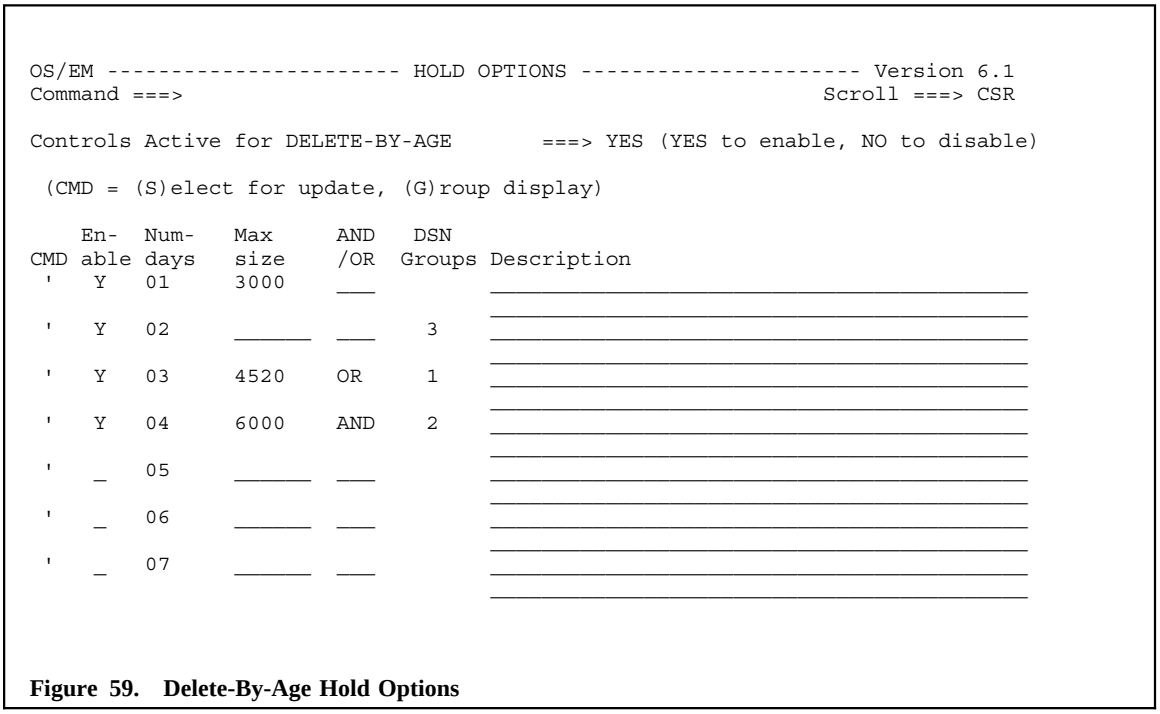
Delete-by-Age Control

DFHSM Delete-by-Age processing is rather draconian in its approach: a single aging factor may be specified after which ALL datasets exceeding this age are deleted.

OS/EM provides finer control by allowing the size of the dataset to be a determining factor, along with various aging factors OS/EM also allows specified datasets to not be deleted, even if they exceed the aging factor.

In order to use this extended function, you must activate DFHSM's Delete-By-Age processing in the appropriate ARCCMDxx parm member. The value must be set low since HSM Optimizer processing actually determines whether a dataset should be deleted. For example, if you wish to start aging datasets after 1 day, the Delete-By-Age parameter in ARCCMDxx must specify 1 day.



```
OS/EM ----------------------- HOLD OPTIONS ---------------------- Version 6.1
Command ===>                                                  Scroll ===> CSR

Controls Active for DELETE-BY-AGE       ===> YES (YES to enable, NO to disable)

 (CMD = (S)elect for update, (G)roup display)

    En-  Num-    Max      AND   DSN
CMD able days    size     /OR  Groups Description
 '   Y   01      3000     ___          _____________________________________________
                                       _____________________________________________
 '   Y   02      ______   ___     3    _____________________________________________
                                       _____________________________________________
 '   Y   03      4520     OR      1    _____________________________________________
                                       _____________________________________________
 '   Y   04      6000     AND     2    _____________________________________________
                                       _____________________________________________
 '   _   05      ______   ___          _____________________________________________
                                       _____________________________________________
 '   _   06      ______   ___          _____________________________________________
                                       _____________________________________________
 '   _   07      ______   ___          _____________________________________________
                                       _____________________________________________
```

Figure 59. Delete-By-Age Hold Options

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable extended processing; **NO** to disable extended processing.

2. CMD

   There are two line commands available, **S** and **G**. You must enter a **S** on any line you make changes to for the changes to be saved.

   Enter a **S** in the CMD field of the line that contains the number of days specified datasets are to be held on Level-0 storage before being eligible for deletion.

   OS/EM allows the specification of 22 different aging factors.

3. Enable Days

   Enter **Y** in the ENABLE area for the specified number of days.

   Enter **N** in the area to deactivate processing for this number of days.

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To update the DSN groups, use the **G** line command. This will cause a POPUP window (see Figure 60 on page 5-29) to appear where you may update the groups.

Use these values, along with MAXSIZE, OR/AND connective and INCLUDEd datasets, to determine how long unreferenced datasets will be held before they are deleted.

4. Maxsize

   Enter **maximum dataset size** to hold in K bytes, **blank to suppress** MAXSIZE criteria.

   Only datasets that are larger than this value will be deleted once they exceed the aging factor.

   This value is in K bytes. Thus, a value of 1000 means that datasets less than or equal to 1,024,000 bytes will not be deleted even if they are older than the specified number of days.

   If you do not wish to hold datasets based on their size, leave this value blank, or blank it if you have already entered a value.

5. OR/AND

   Enter logical connection between MAXSIZE and INCLUDEd datasets: OR = MAXSIZE datasets or specified datasets; AND = MAXSIZE datasets and specified datasets; blank = suppress OR/AND criteria.

   A logical connection between the MAXSIZE specification and INCLUDEd datasets is established by entering **OR** or **AND**.

   If you enter **OR**, datasets will be held if they do not exceed the MAXSIZE value, OR if the dataset is in any of the dataset name groups that are in the INCLUDE list.

   If you enter **AND**, datasets will be held if they do not exceed the MAXSIZE value, AND the dataset is in any of the dataset name groups that are in the INCLUDE list.

6. Add or Delete DSN Groups

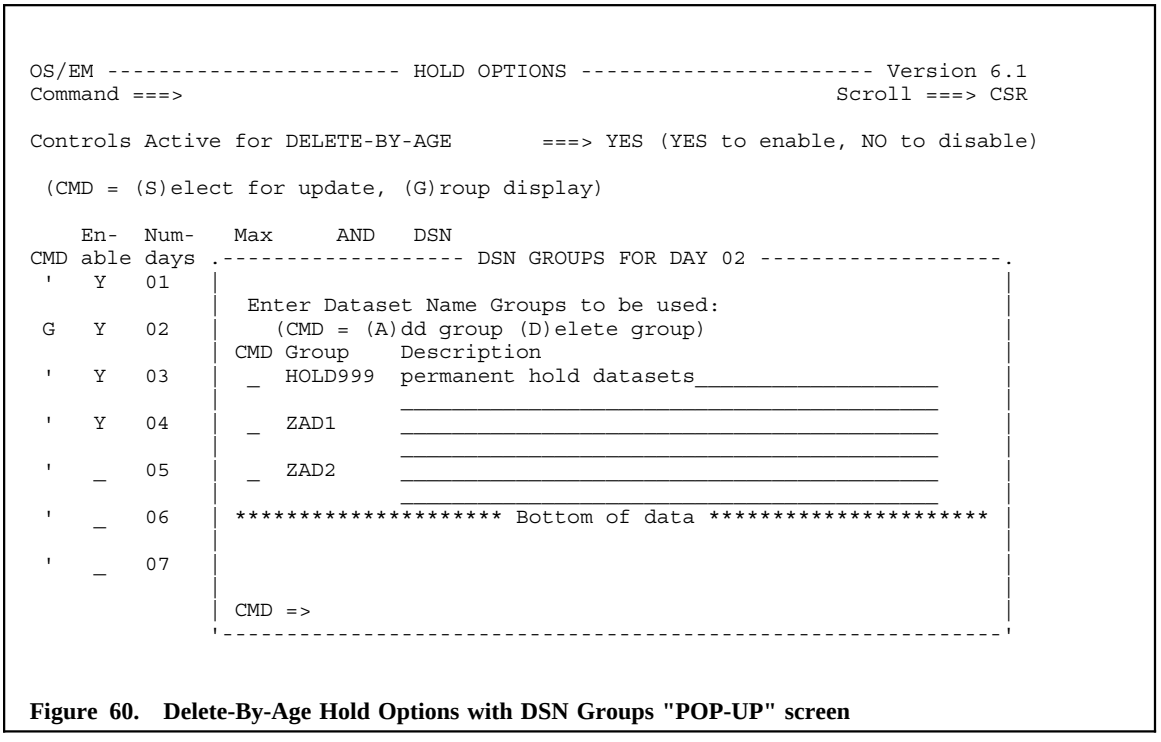

Figure 60. Delete-By-Age Hold Options with DSN Groups "POP-UP" screen

Use the "POP-UP" panel to add or delete the DSN Groups.

The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

Group names are up to eight characters in length. Create them by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

- To add a dataset name group, enter an **A** in the CMD field and the name of the dataset name group in the group field. Type a description of the group in the description field. Overtype any existing entry - the old entry will not be altered.
- To delete an existing entry, enter a **D** in the CMD field.

Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

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Delete-if-Backed-Up Control

DFHSM can be directed to delete datasets that it has backed up, but as with Delete-By-Age processing, it is an all or nothing approach.

OS/EM provides finer control by allowing the size of the dataset to be a determining factor, along with various aging factors OS/EM also allows specified datasets to not be deleted, even if they exceed the aging factor.

In order to use this extended function, you must activate DFHSM's Delete-If-Backed-Up processing in the appropriate ARCCMDxx parm member.

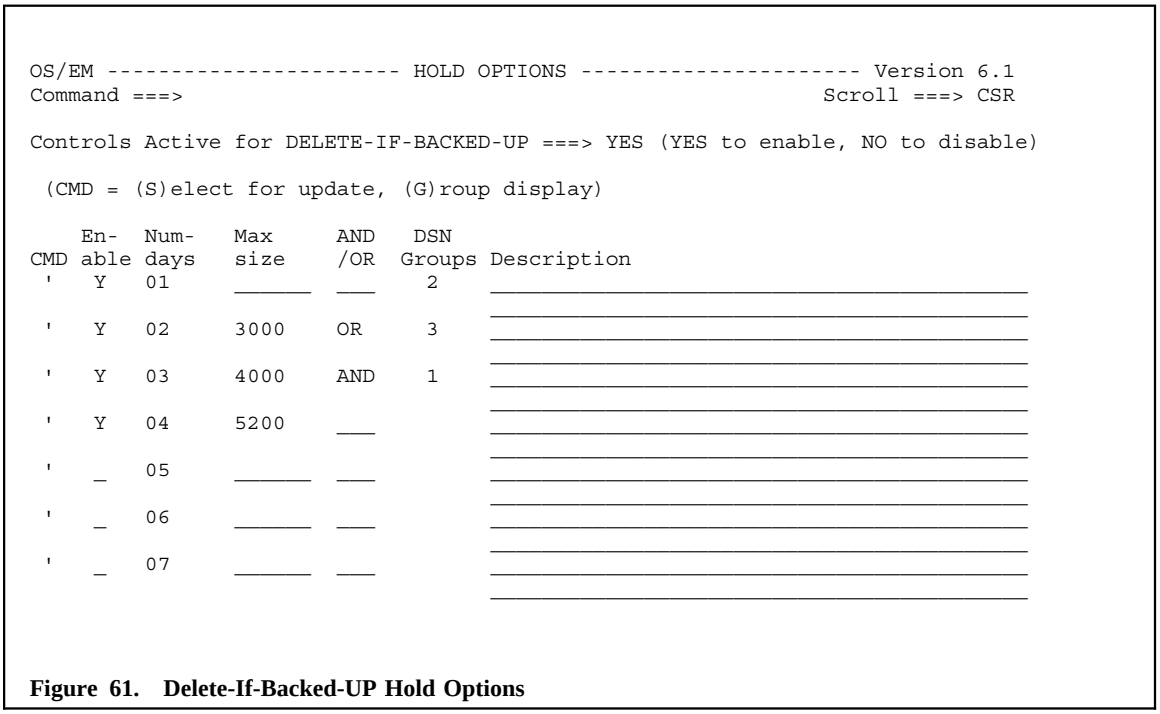

Figure 61. Delete-If-Backed-UP Hold Options

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable extended processing; **NO** to disable extended processing.

   Enter an **S** to select the days specified datasets are to be held on Level-0 storage before being eligible for deletion.

   Enter a **Y** in the ENABLE area to activate hold processing for the specified number of days.

   OS/EM allows the specification of 22 different aging factors.

   Use these values, along with MAXSIZE, OR/AND connective and INCLUDEd datasets, to determine how long unreferenced datasets will be held before they are deleted.

2. Maxsize

   Enter maximum dataset size to hold in K bytes, blank to suppress MAXSIZE criteria.

   Only datasets that are larger than this value will be deleted once they exceed the aging factor.

   This value is in K bytes. Thus, a value of 1000 means that datasets less than or equal to 1,024,000 bytes will not be deleted even if they are older than the specified number of days.

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If you do not wish to hold datasets based on their size, leave this value blank, or blank it if you have already entered a value.

3. OR/AND

   Enter logical connection between MAXSIZE and INCLUDEd datasets: OR = MAXSIZE datasets or specified datasets; AND = MAXSIZE datasets and specified datasets; blank = suppress OR/AND criteria.

   A logical connection between the MAXSIZE specification and INCLUDEd datasets is established by entering **OR** or **AND**.

   If you enter **OR**, datasets will be held if they do not exceed the MAXSIZE value, OR if the dataset is in any of the dataset name groups that are in the INCLUDE list.

   If you enter **AND**, datasets will be held if they do not exceed the MAXSIZE value, AND if the dataset is in any of the dataset name groups that are in the INCLUDE list.

4. DSN Groups

   If you wish to INCLUDE a list of datasets which will not be deleted, enter **G** in the CMD field. When the enter key is pressed, a pop-up window will be displayed where you can specify the group names.

5. Add or Delete DSN Groups

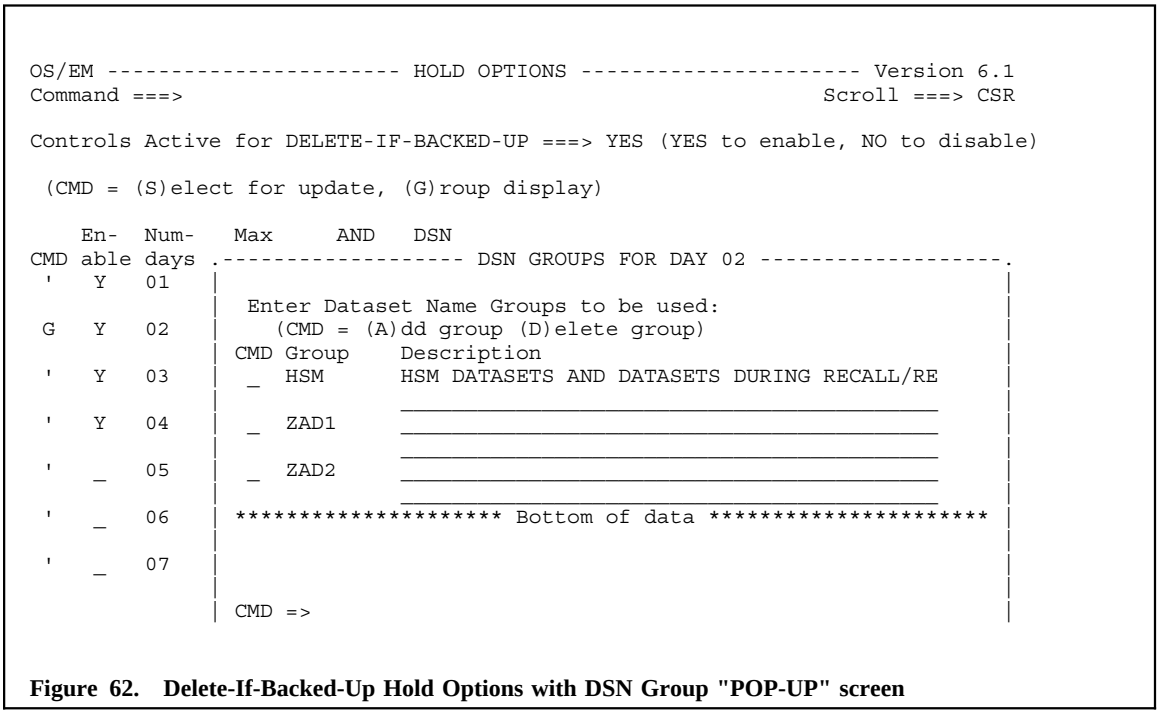

Figure 62. Delete-If-Backed-Up Hold Options with DSN Group "POP-UP" screen

Use the "POP-UP" panel to add or delete the DSN Groups.

The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

Group names are up to eight characters in length. They are created by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

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To add a dataset name group, enter an **A** in the CMD field and the name of the dataset name group in the group field. Type a description of the group in the description field. Overtype any existing entry - the old entry will not be altered.

To delete an existing entry, enter a **D** in the CMD field.

Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

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Direct-to-Level-2 Control

Datasets that are not used on a regular basis, say daily or weekly, should probably be migrated. However, you do not want to exhaust ML1 storage with such datasets. ML2 storage (tape) is provided by DFHSM for this purpose. But DFHSM only migrates from ML0-ML1-ML2, unless you manually issue a DFHSM command to migrate a particular dataset directly to ML2 storage. The Optimizer can automate this process.

Selecting DIRML2 presents you with the MIGRATION CONTROL:DIR TO ML2 panel (Figure 63). This panel is similar to those already shown except that there are no HOLD days to specify. You ENABLE or DISABLE DIRML2 processing on this panel; specify a MINIMUM dataset size (datasets equal to or greater than this size will be eligible for DIRML2 processing); specify the logical connective between size and the dataset name group list, and whether the dataset name group list is an INCLUDE list or an EXCLUDE list (only one type of list may be created).

Direct migration to Level-2 storage may be controlled by use of this option. A minimum size for such datasets may be established; and, via an OR/AND connective, either include or exclude datasets from such processing.

The intent of this option is to move large, infrequently used datasets directly to Level-2 storage (usually tape) freeing Level-1 storage for smaller frequently used datasets.

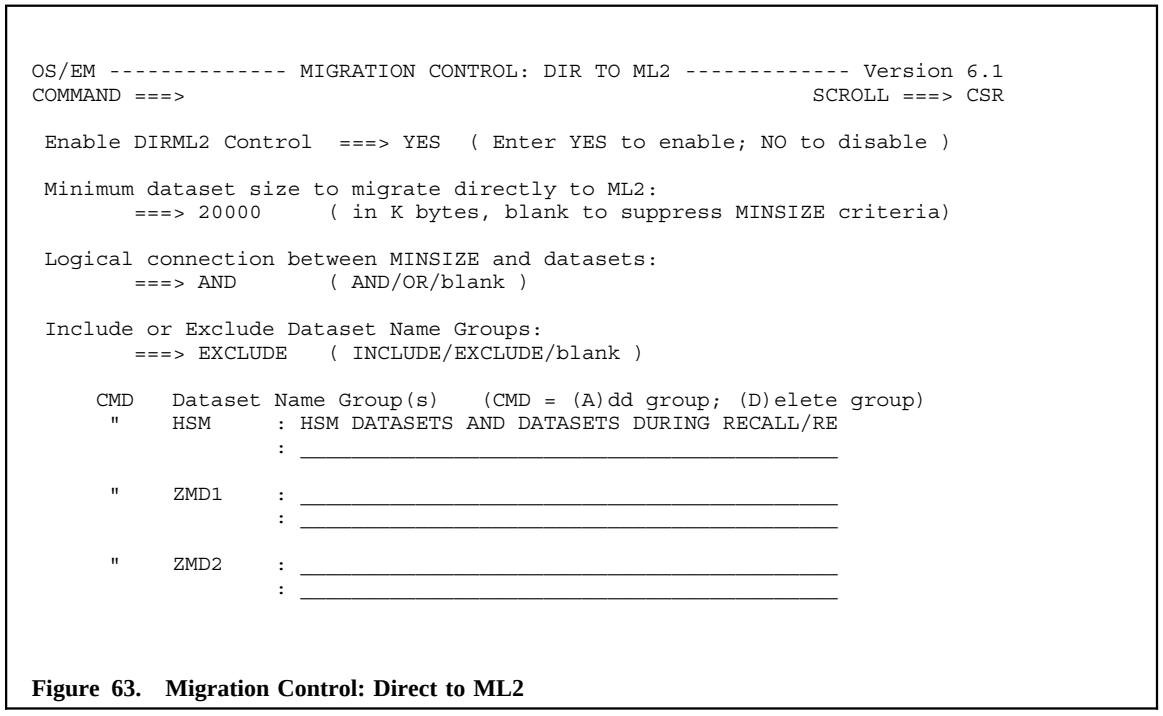

Figure 63. Migration Control: Direct to ML2

Field entry is as follows:

1. DIRML2 Control

   Enter **YES** to enable Migration control.

   Enter **NO** to disable Migration Control.

2. MINSIZE

   Enter **minimum dataset size** (in K bytes) to migrate directly to ML2; **blank to suppress** MINSIZE criteria.

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Only datasets that are equal to or larger than this specified size will be eligible for direct migration to Level-2 storage.

If you do not wish to direct datasets to Level-2 storage based on their size, leave this field blank or blank it out if you have already entered a value.

3. OR/AND

   Enter logical connection between MINSIZE and INCLUDED/EXCLUDED datasets.

   A logical connection between the MINSIZE specification and the INCLUDEd or EXCLUDEd datasets is established by entering **OR/AND**.

   If you enter **OR**, datasets will be selected if they are MINSIZE OR in the INCLUDE or EXCLUDE lists.

   If you enter **AND**, datasets will be selected if they are either MINSIZE AND also in the INCLUDE or EXCLUDE lists.

4. INCLUDE/EXCLUDE

   Enter **INCLUDE** to include Dataset Name Groups, or **EXCLUDE** to exclude Dataset Name Groups.

   Note: You may have either an INCLUDE list or an EXCLUDE list, but NOT both.

5. Add or Delete a Dataset Name Group

   The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

   Group names are up to eight characters in length. Create them by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

   Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

   - To add a dataset name group, enter an **A** in the CMD field and the name of the dataset name group in the group field. Type a description of the group in the description field. Overtype any existing entry - the old entry will not be altered.
   - To delete an existing entry, enter a **D** in the CMD field.

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Early Batch Recall

OS/EM's early batch recall function will cause DFSMSHSM to recall needed datasets while the job waits in the input queue, thus keeping initiators available for jobs which can begin execution immediately.

Note: This control is unique to each JES2 subsystem you have defined. Use Primary Option 6 - Set JES name to control which JES2 subsystem you are updating (see “Set JES2 Name” on page 8-1.)

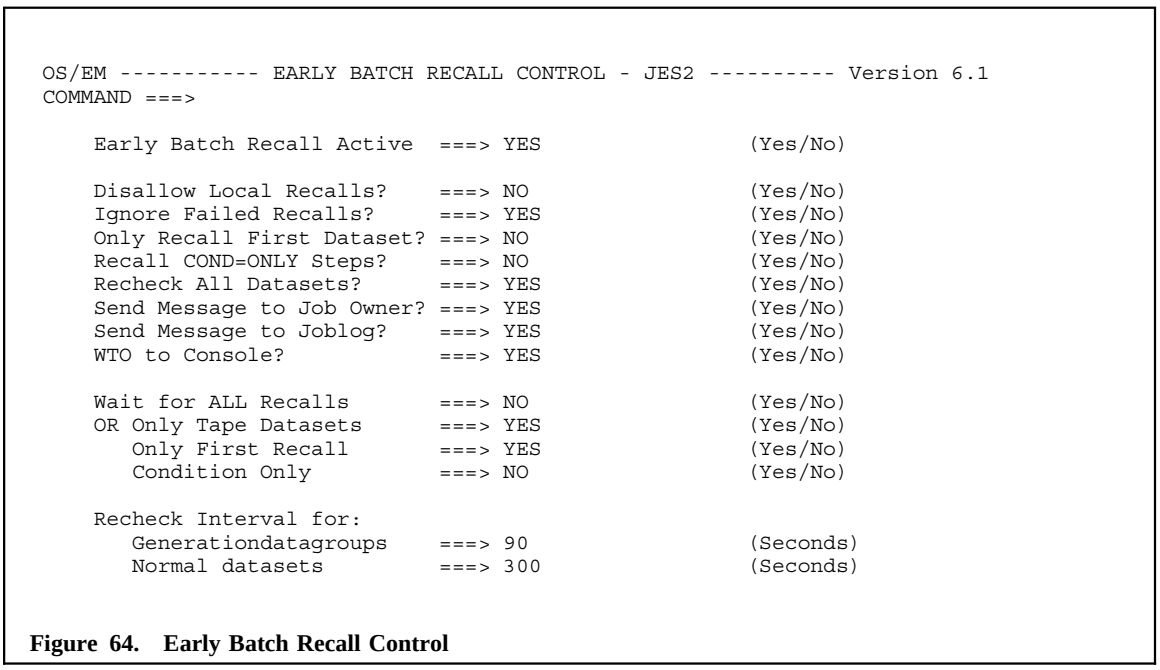

Figure 64. Early Batch Recall Control

The options and their meanings follow:

Disallow Local Recalls? OS/EM will not issue the recall request on the local system.

Ignore Failed Recalls? OS/EM will allow the job to be selected for execution even if an early recall has failed.

Only Recall First Dataset? OS/EM will only issue a recall request for the first dataset of the job.

Send Message to Job Owner? OS/EM will send a TSO message to the owner of a job that is being held because of pending recalls.

Send Message to Joblog? OS/EM will write a message to the joblog showing the datasets recalled.

Send Message to Console? OS/EM will write the following message to the console:

FEM2HM251 OS/EM INITIATING HRECALL OF dataset.

Wait for ALL Recalls? OS/EM will block execution of the job until all migrated datasets have been recalled.

Wait for Only Tape Datasets? OS/EM will only block execution of the job if the job had datasets migrated to tape. This cannot be YES if 'Wait for ALL Recalls?' is set to YES.

Wait for Only First Recall? OS/EM will only block execution of the job until the first migrated dataset has been recalled. This cannot be YES if 'Wait for ALL Recalls?' is set to YES.

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Wait for Condition Only? OS/EM will block execution of the job until all migrated datasets in COND=ONLY steps have been recalled. This cannot be YES if 'Wait for ALL Recalls?' is set to YES.

Recheck Interval for Generationdatagroups
Specify the time in seconds that OS/EM will wait before rechecking the status of a HRECALL request. Default time is 30 seconds.

Recheck Interval for Normal Datasets
Specify the time in seconds that OS/EM will wait before rechecking the status of a HRECALL request. Default time is 300 seconds.

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Force DSORG to PS

This control is applied to datasets which have been allocated but never opened, which leaves an unknown DSORG causing DFSMSHSM to bypass the dataset during migration and backup processing.

Forcing the DSORG to PS allows DFSMSHSM to process the dataset.

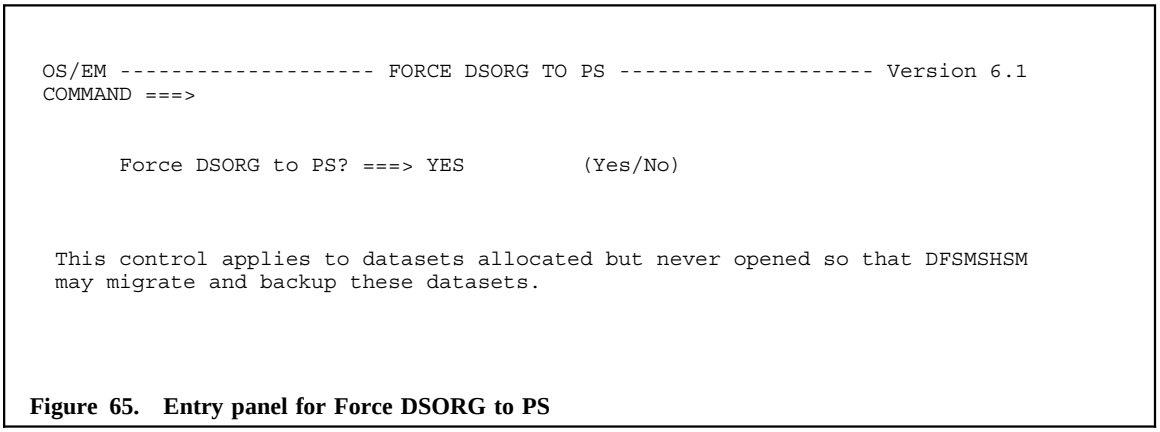

Figure 65. Entry panel for Force DSORG to PS

Enter **YES** to force the DSORG, or enter **NO** to leave unopened new datasets alone.

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Migration Control (ML0-ML1)

OS/EM's migration control extends standard DFHSM migration control by considering the size of datasets and the number of days a dataset has been resident on Level-0 storage.

In order to use this extended function, you must activate DFHSM's migration processing in the appropriate ARCCMDxx parm member.

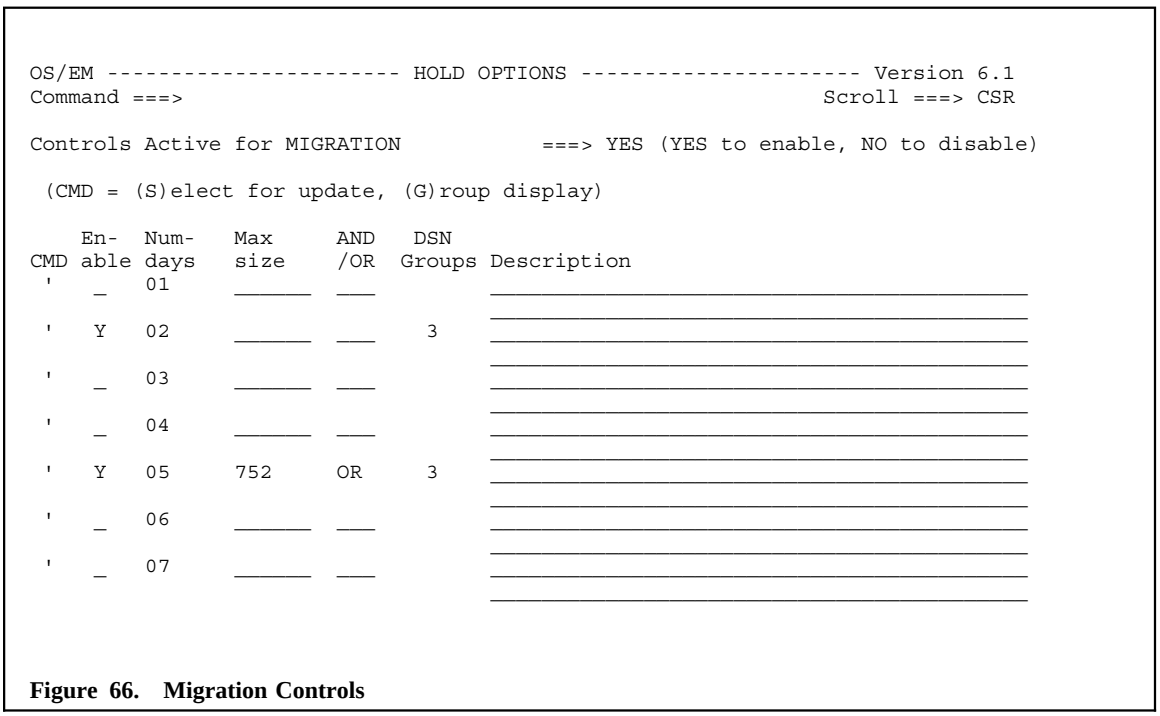

Figure 66. Migration Controls

Migration from primary storage (referred to as Level-0 or ML0 storage) to secondary storage (referred to as Level-1 or ML1 storage) moves datasets from primary to secondary storage when they exceed the aging criterion. Such datasets are commonly compressed to maximize secondary storage utilization. DFHSM also supports Small-Dataset-Packing (SDSP), which allows small datasets to become records within a single VSAM file which you establish.

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable extended processing; **NO** to disable extended processing.

   OS/EM allows the specification of 22 different aging factors.

   Use these values, along with MAXSIZE, OR/AND connective and INCLUDEd datasets, to determine how long unreferenced datasets will be held before they are migrated.

2. Enable

   Enter **Y** in the ENABLE area to activate hold processing for the specified number of days.

   Note: You must use either the **S** or **G** line command for any updates to take place.

3. Maxsize

   Enter **maximum dataset size** to hold in K bytes, **blank to suppress** MAXSIZE criteria.

   Only datasets that are larger than this value will be migrated once they exceed the aging factor.

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This value is in K bytes. Thus, a value of 1000 means that datasets less than or equal to 1,024,000 bytes will not be migrated even if they are older than the specified number of days.

If you do not wish to hold datasets based on their size, leave this value blank, or blank it if you have already entered a value.

4. OR/AND

   Enter logical connection between MAXSIZE and INCLUDEd DSN Groups; OR = MAXSIZE datasets or specified DSN Groups; AND = MAXSIZE datasets and specified DSN Groups; blank = suppress OR/AND criteria.

   A logical connection between the MAXSIZE specification and INCLUDEd DSN Groups is established by entering **OR** or **AND**.

   If you enter **OR**, datasets will be held if they do not exceed the MAXSIZE value, OR if the dataset is in any of the dataset name groups that are in the INCLUDE list. The default is OR.

   If you enter **AND**, datasets will be held if they do not exceed the MAXSIZE value, AND if the dataset is in any of the dataset name groups that are in the INCLUDE list.

5. INCLUDE/EXCLUDE

   Enter **INC** to include Dataset Name Groups, **EXC** to exclude Dataset Name Groups.

   Note: You may have either an INCLUDE list or an EXCLUDE list, but NOT both.

6. DSN Groups

   If you wish to INCLUDE a list of datasets which will not be migrated, enter **Y** in this field.

   Enter **N** to not have an INCLUDE list.

7. Add or Delete DSN Groups

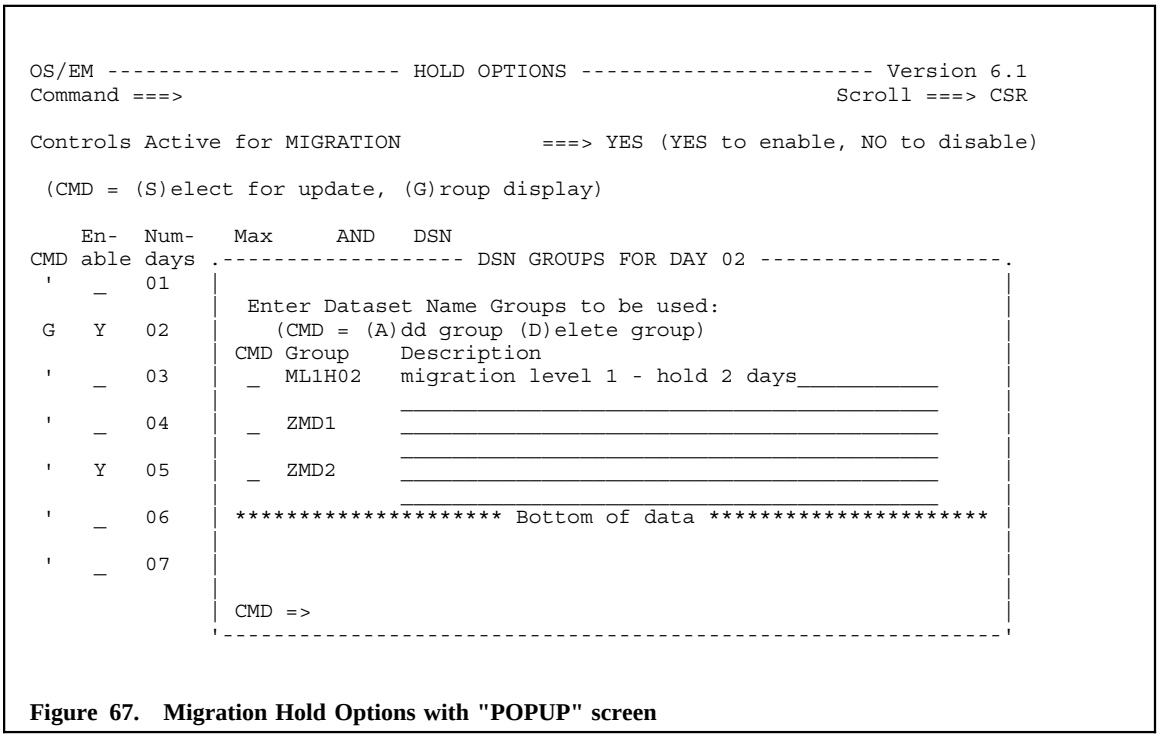

Figure 67. Migration Hold Options with "POPUP" screen

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The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

Group names are up to eight characters in length. Create them by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

- To add a dataset name group, enter an **A** in the CMD field and the name of the dataset name group in the group field. Type a description of the group in the description field. Overtype any existing entry - the old entry will not be altered.
- To delete an existing entry, enter a **D** in the CMD field.

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Migration Level-2 Control (ML1-ML2)

Migration from secondary storage to the final level (referred to as Level-2 or ML2 storage, and most commonly tape) moves datasets when ML1 storage exceeds its defined threshold and room must be made to hold the datasets migrated to ML1 storage from ML0 storage (Primary).

Each of these functions presents a first panel such as illustrated by the Delete-by-Age Control panel (Figure 59 on page 5-28). The function (DBA, DBU, MIG, ML2) is ENABLED by specific HOLD day. Each specific HOLD day may be ENABLED--enter a **Y** on the ENABLE area of the HOLD day you desire (use Y to also change a HOLD day specification)--or DISABLED by entering a **N** in the ENABLE area of the HOLD day selection. You may change the description connected with a particular HOLD day at any time. You might consider using the description to briefly annotate the criteria being used for HOLD day. The illustration shows HOLD day 3 with such a description.

Note: Hold day 9999 represents a special case. A dataset placed in this HOLD day will never age. The effect is identical to specifying NOMIG for the dataset in your ARCCMDxx member.

Figure 60 on page 5-29 shows the panel presented when you enable a particular HOLD day. The title area of the panel will indicate the HOLD day you are currently specifying. If you find that you have chosen the wrong day, CANCEL the panel and you will be returned to the HOLD day selection list.

The action of a particular HOLD day may be qualified by a maximum dataset size to hold, and a list of datasets which should be included with the HOLD day. If you specify none of these options, ALL datasets, not otherwise qualified, will be aged for possible processing. This still extends DFHSM processing by giving you multiple aging factors. However, the best use of a HOLD day is to specify a maximum dataset size and specify a dataset name list.

The maximum dataset size you specify indicates that if a particular dataset is less than or equal to the maximum size, it will not be processed (the size is expressed in K).

Note: To be effective, this number should decrease as the number of days a dataset is held (not deleted or migrated) increases. That is, large datasets should be held for a few days; small datasets can be effectively held for a longer period of time. While there is no requirement that this policy be implemented, holding large datasets beyond when DFHSM processing would normally remove eligible datasets from a volume defeats the purpose of removing such datasets--maximizing available DASD space.

If a particular dataset resolves to the include list, it will not be processed. You can connect the two criteria with the AND/OR connective.

If you specify that a dataset name group INCLUDE list should be part of the HOLD day's processing, you will be presented with the standard DATASET NAME GROUPS panel already presented (Figure 44 on page 5-3).

The relationship between these various elements is best demonstrated with an example. Assume the following has been established for the indicated HOLD days:

DAY	Maxsize	Connective	Include
9999	50	AND	SYSXGRP P3RDINS
2	130	OR	TESTGRP
10			DEVTEMP
15	30	AND	TESTT

Assume, also, that the following dataset name groups have been previously defined:

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GROUP	Datasets, dataset name masks
SYSXBRP	SYSX.+ All datasets that begin with SYSX.
P3RDINS	P3RD.INSTALL.+ All datasets that begin with PR3D.INSTALL
TESTGRP	TEST.+ All datasets that begin with TEST
DEVTMP	$DEV%%%.TEMP.+ Datasets that begin with $DEV
TESTT	TEST.T?????.- Datasets which begin with TEST.T plus any five characters and one other node name.
PRODW	PROD.WORKS%% sys%%%%.- Datasets which begin with PROD as the first node

Although the above examples show only one dataset name mask in each group, dataset name groups may contain multiple fully qualified dataset names and/or multiple dataset name masks.

Determining whether a particular dataset should be processed is as follows:

- Datasets which do not exceed 50K AND match dataset names or masks contained within dataset name groups SYSXGRP or P3RDINS will never be migrated or deleted.
- Datasets which do not exceed 130K OR match dataset names or masks contained within dataset name group TESTGRP will not be migrated or deleted for two days. After this time, they will be eligible for migration or deletion.
- Datasets which match dataset names or masks contained within dataset name group DEVTMP will be retained for ten days. After this time, they will be eligible for migration or deletion.
- Datasets which do not exceed 30K AND match dataset names or masks contained within dataset name group TESTT will be held for fifteen days. After this time, they will become eligible for migration or deletion.

While limited, this example shows the definitions you need to effectively manage DFHSM. Remember, the goal is to ensure that active datasets are always available in a timely manner and to maximize your primary storage utilization.

> **ML2 usage note:** Remember that datasets will not be held if Level-2 storage is not tape. The purpose for keeping datasets from migrating to tape Level-2 storage is to hasten their recall. If Level-2 storage is another DASD device, such a consideration does not apply. Issuing the FREEVOL AGE(0) command will also bypass ML2 hold processing. It is assumed that if you issue this command, the Level-1 volume is to be cleared.

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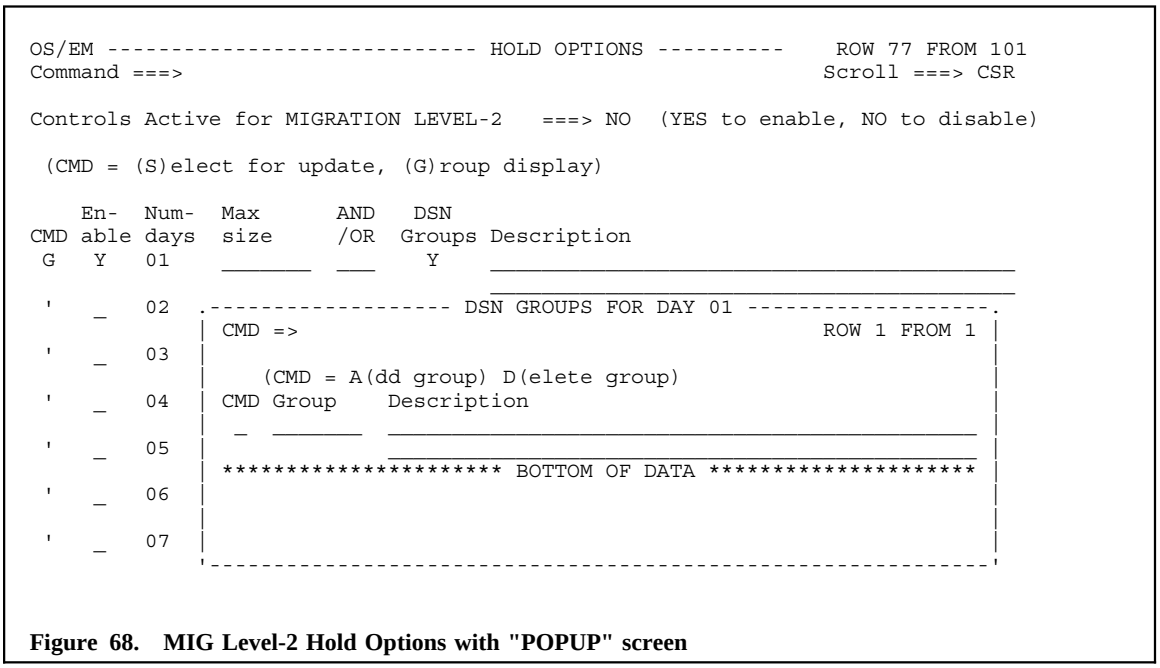

Figure 68. MIG Level-2 Hold Options with "POPUP" screen

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable extended processing; **NO** to disable extended processing.

   This field must be completed before you will be allowed to leave the panel.

   Enter a **S** in the CMD field to select the hold days for datasets to be held on Level-1 storage before being eligible for migration.

   Enter a **Y** in the ENABLE area to activate hold processing for the specified number of days.

   OS/EM allows the specification of 22 different aging factors.

   Use these values, along with MAXSIZE, OR/AND connective and INCLUDEd datasets, to determine how long unreferenced datasets will be held before they are migrated.

2. Maxsize

   Enter **maximum dataset** size to hold in K bytes; blank to suppress MAXSIZE criteria.

   Only datasets that are larger than this value will be deleted once they exceed the aging factor.

   This value is in K bytes. Thus, a value of 1000 means that datasets less than or equal to 1,024,000 bytes will not be migrated even if they are older than the specified number of days.

   Leave this value blank if you do not wish to hold datasets based on their size, or blank it out if you have already entered a value.

3. OR/AND

   Enter logical connection between MAXSIZE and INCLUDEd DSN Groups; OR = MAXSIZE datasets or specified DSN Groups; AND = MAXSIZE datasets and specified DSN Groups; blank = suppress OR/AND criteria.

   A logical connection between the MAXSIZE specification and INCLUDEd DSN Groups is established by entering **OR** or **AND**.

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If you enter **OR**, datasets will be held if they do not exceed the MAXSIZE value, OR if the dataset is in any of the dataset name groups that are in the INCLUDE list. The default is OR.

If you enter **AND**, datasets will be held if they do not exceed the MAXSIZE value, AND if the dataset is in any of the dataset name groups that are in the INCLUDE list.

4. INCLUDE/EXCLUDE

   Enter **INC** to include Dataset Name Groups, **EXC** to exclude Dataset Name Groups.

   Note: You may have either an INCLUDE list or an EXCLUDE list, but NOT both.

5. DSN Groups

   If you wish to INCLUDE a list of datasets which will not be deleted, enter **G** in the CMD field; a pop-up window will open to allow entry of the DSN Groups.

   Use the "POPUP" panel to add or delete the DSN Groups.

   The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

   Group names are up to eight characters in length. They are created by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

   Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

   - To add a dataset name group, enter an **A** in the CMD field and the name of the dataset name group in the group field. Type a description of the group in the description field. Overtype any existing entry - the old entry will not be altered.
   - To delete an existing entry, enter a **D** in the CMD field.

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Prioritize Recall/Recover Requests

This function allows you to prioritize DFHSM recall and recover requests based on where the request was generated: Batch or Online; where the data resides: DASD or Tape. You may limit the requests that are prioritized by time of day/day of week, job name/mask, dataset name/mask or user ID/mask. A request which does not meet any of these selection criteria will receive the specified default priority.

In order to use this extended function, you must activate DFHSM's ARCRPEXT exit processing in the appropriate ARCCMDxx parmlib member.

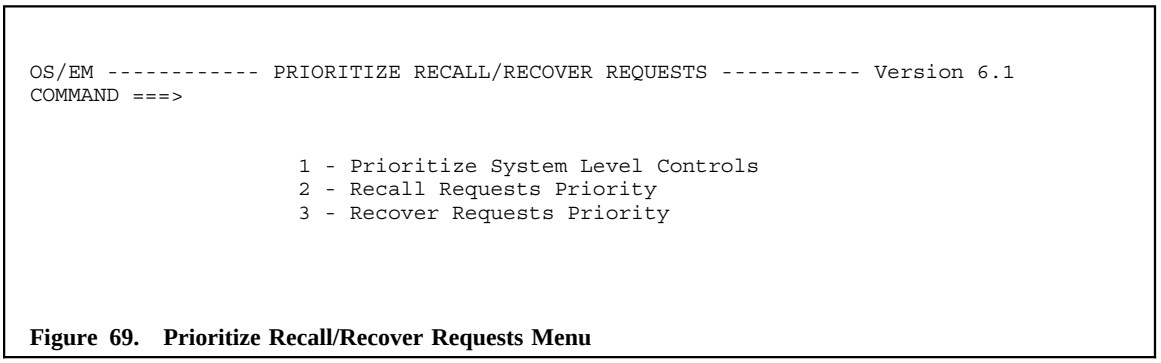

Figure 69. Prioritize Recall/Recover Requests Menu

The primary menu for this function contains three options. Option 1: 'Prioritize System Level Controls' must always be filled out, as this is where the function is turned on or off. Options 2 and 3 are filled in as needed.

Each of these paths is presented in the following sections:

1. Prioritize System Level Controls (see “Prioritize System Level Controls” on page 5-47)
2. Recall Requests Priority (see “Recall Requests Priority” on page 5-48)
3. Recover Requests Priority (see “Recover Requests Priority” on page 5-51)

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Prioritize System Level Controls

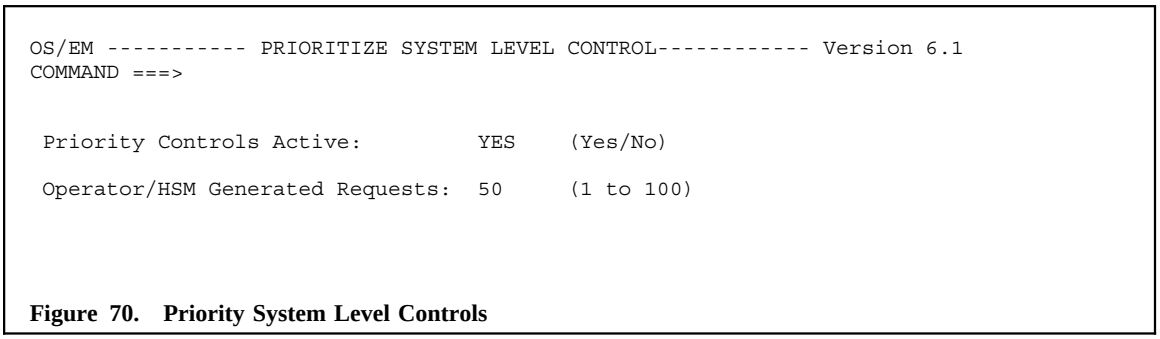

Figure 70. Priority System Level Controls

To turn priority controls on or off enter **YES** or **NO** in the 'Priority Controls Active' field.

To specify a priority setting for **operator** or HSM internally generated requests, enter the value in the second field.

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Recall Requests Priority

```
OS/EM ------------------- HSM RECALL PRIORITY -------------------- Version 6.1
COMMAND ===>                                                   SCROLL ===> CSR

    Controls Active:   NO        (Yes/No)
    Default Priority:  ___       (1 to 100)
                                                              Job  DS    User
                                                  (1234)  Days  Name  Name  ID
                                                  Weight:  _     _     _     _
(S)elect Group, (D)elete Group
    Priority        Request from    |  Data coming from
Sel Number  Active  Batch / Online  |   DASD  /  Tape
 _   1        N     ___     ___     |   ___      ___
 _   2        N     ___     ___     |   ___      ___
 _   3        N     ___     ___     |   ___      ___
 _   4        N     ___     ___     |   ___      ___
 _   5        N     ___     ___     |   ___      ___
 _   6        N     ___     ___     |   ___      ___
 _   7        N     ___     ___     |   ___      ___
 _   8        N     ___     ___     |   ___      ___
 _   9        N     ___     ___     |   ___      ___
 _   10       N     ___     ___     |   ___      ___
 _   11       N     ___     ___     |   ___      ___
 _   12       N     ___     ___     |   ___      ___
```

Figure 71. Recall Selection Lists

There are 22 selection lists or groups available. For each list you may specify time of day by day of week, job names/masks, dataset names/masks or user ids/masks. Each list has its own priority setting.

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable **RECALL** priority processing; **NO** to disable RECALL processing.

2. Default Priority

   Enter a value from 1 to 100 to specify the priority that requests which do not match one of the 22 selection lists will receive.

3. Weight

   For the four selection types, enter the weight which is to be given to each type.

   Each active selection list is checked for a matching entry. The **weight** parameters are added to each matching entry and the list with the highest value will be used to determine the priority given to the request.

The scrollable portion of the panel contains the 22 selection lists. Four line commands are used to access the selection types.

Field entry is as follows:

1. Sel

   Two line commands are available: **S** to update the selection entries or **D** to delete the selection entries.

   No line command is needed to update any other field, simply overtype the field and press enter for the selection list to be updated.

2. Active

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Enter a **Y** to activate this selection list, or a **N** to deactivate it. Deactivating the list allows the selection type entries to remain even though they are not used. This allows you to turn on the selection list at a later time without having to re-specify the different type entries.

3. Request from Batch

   Enter a value here from 1 to 99.

   The **batch, online, DASD and tape** parameters control the actual priority value assigned to a request. OS/EM determines if the request is from a batch job or an online user, and whether the dataset to be recalled/recovered is currently stored on tape or DASD. It then calculates the priority to be assigned by adding the stated values together.

   As an example, if the following values have been specified to OS/EM:

```
BATCH:  30        TAPE:  40
ONLINE: 40        DASD:  45
```

   If a request is received from a batch job, and HSM has the dataset stored on DASD, the priority assigned to the request would be:

```
30 + 45 = 75%
```

   While a request from an online user for a dataset which is stored on tape would be:

```
40 + 40 = 80%
```

4. Request from Online

   Enter a value from 1 to 99.

5. Data coming from DASD

   Enter a value from 1 to 99.

6. Data coming from Tape

   Enter a value from 1 to 99.

The final four fields on this panel will display either **INC** or **EXC** depending if you have entered any selection type items.

The selection group panel is a scrollable list of all the selectors needed to determine the jobs/users which should have the appropriate priority.

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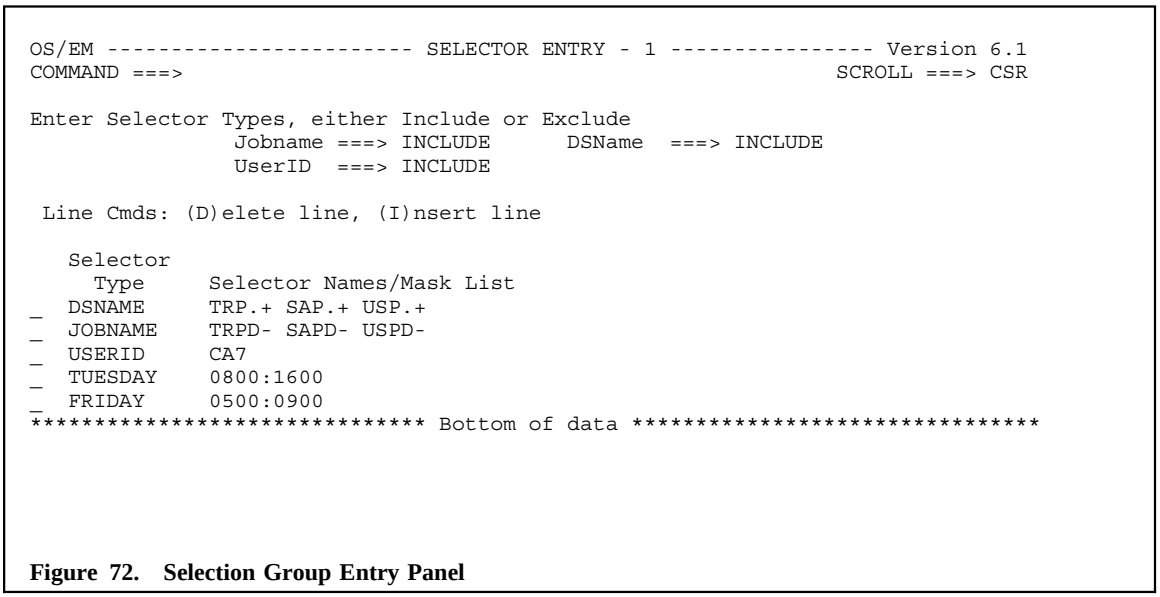

Figure 72. Selection Group Entry Panel

The selector types for this function are:

MONDAY - SUNDAY Days of the week are used to allow entry of time values. In the above example the selection group is only applicable on Tuesday between 8AM and 4PM or Friday between 5AM and 9AM. Only one time range per day is permitted. Be sure to enter the time in 24 hour format separating the beginning and ending times with a colon (:).

JOBNAME Enter complete jobnames or jobname masks. You may enter as many names or masks as will fit on the line (separated by spaces). If more names/masks are needed, insert another line and use the same selector type (JOBNAME).

DSNAME Enter full dataset names or dataset name masks. You may enter as many names or masks as will fit on the line (separated by spaces). If more names/masks are needed, insert another line and use the same selector type (DSNAME).

USERID Enter user IDs or user ID masks separated by spaces. You may enter as many IDs/masks as will fit on the line. If more IDs/masks are needed simply insert another blank line and use the same selector type (USERID).

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Recover Requests Priority

```
OS/EM ------------------- HSM RECALL PRIORITY -------------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

    Controls Active:   NO        (Yes/No)
    Default Priority:  ___       (1 to 100)
                                                              Job  DS    User
                                                  (1234)  Days  Name  Name  ID
                                                  Weight:  _     _     _     _
(S)elect Group, (D)elete Group
    Priority        Request from    |  Data coming from
Sel Number  Active  Batch / Online  |   DASD  /  Tape
 _   1        N     ___     ___     |   ___      ___
 _   2        N     ___     ___     |   ___      ___
 _   3        N     ___     ___     |   ___      ___
 _   4        N     ___     ___     |   ___      ___
 _   5        N     ___     ___     |   ___      ___
 _   6        N     ___     ___     |   ___      ___
 _   7        N     ___     ___     |   ___      ___
 _   8        N     ___     ___     |   ___      ___
 _   9        N     ___     ___     |   ___      ___
 _   10       N     ___     ___     |   ___      ___
 _   11       N     ___     ___     |   ___      ___
 _   12       N     ___     ___     |   ___      ___
```

Figure 73. Recover Selection Lists

There are 22 selection lists or groups available. For each list you may specify time of day by day of week, job names/masks, dataset names/masks or user ids/masks. Each list has its own priority setting.

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable **RECOVER** priority processing; **NO** to disable RECOVER processing.

2. Default Priority

   Enter a value from 1 to 100 to specify the priority that requests which do not match one of the 22 selection lists will receive.

3. Weight

   For the four selection types, enter the weight which is to be given to each type.

   Each active selection list is checked for a matching entry. The **weight** parameters are added to each matching entry and the list with the highest value will be used to determine the priority given to the request.

The scrollable portion of the panel contains the 22 selection lists. Four line commands are used to access the selection types.

Field entry is as follows:

1. Sel

   Two line commands are available: **S** to update the selection entries or **D** to delete the selection entries.

   No line command is needed to update any other field, simply overtype the field and press enter for the selection list to be updated.

2. Active

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Enter a **Y** to activate this selection list, or a **N** to deactivate it. Deactivating the list allows the selection type entries to remain even though they are not used. This allows you to turn on the selection list at a later time without having to re-specify the different type entries.

3. Request from Batch

   Enter a value here from 1 to 99.

   The **batch, online, DASD and tape** parameters control the actual priority value assigned to a request. OS/EM determines if the request is from a batch job or an online user, and whether the dataset to be recalled/recovered is currently stored on tape or DASD. It then calculates the priority to be assigned by adding the stated values together.

   As an example, if the following values have been specified to OS/EM:

```
BATCH:  30        TAPE:  40
ONLINE: 40        DASD:  45
```

   If a request is received from a batch job, and HSM has the dataset stored on DASD, the priority assigned to the request would be:

```
30 + 45 = 75%
```

   While a request from an online user for a dataset which is stored on tape would be:

```
40 + 40 = 80%
```

4. Request from Online

   Enter a value from 1 to 99.

5. Data coming from DASD

   Enter a value from 1 to 99.

6. Data coming from Tape

   Enter a value from 1 to 99.

The final four fields on this panel will display either **INC** or **EXC** depending if you have entered any selection type items.

The selection group panel is a scrollable list of all the selectors needed to determine the jobs/users which should have the appropriate priority.

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```
OS/EM ------------------------ SELECTOR ENTRY - 1 ---------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR

Enter Selector Types, either Include or Exclude
               Jobname ===> INCLUDE      DSName  ===> INCLUDE
               UserID  ===> INCLUDE

 Line Cmds: (D)elete line, (I)nsert line

   Selector
     Type     Selector Names/Mask List
_  DSNAME     TRP.+ SAP.+ USP.+
_  JOBNAME    TRPD- SAPD- USPD-
_  USERID     CA7
_  TUESDAY    0800:1600
_  FRIDAY     0500:0900
****************************** Bottom of data ********************************
```

Figure 74. Selection Group Entry Panel

The selector types for this function are:

MONDAY - SUNDAY Days of the week are used to allow entry of time values. In the above example the selection group is only applicable on Tuesday between 8AM and 4PM or Friday between 5AM and 9AM. Only one time range per day is permitted. Be sure to enter the time in 24 hour format separating the beginning and ending times with a colon (:).

JOBNAME Enter complete jobnames or jobname masks. You may enter as many names or masks as will fit on the line (separated by spaces). If more names/masks are needed, insert another line and use the same selector type (JOBNAME).

DSNAME Enter full dataset names or dataset name masks. You may enter as many names or masks as will fit on the line (separated by spaces). If more names/masks are needed, insert another line and use the same selector type (DSNAME).

USERID Enter user IDs or user ID masks separated by spaces. You may enter as many IDs/masks as will fit on the line. If more IDs/masks are needed simply insert another blank line and use the same selector type (USERID).

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Quick Delete Control

The Quick Delete function allows OS/EM to delete files which are migrated by issuing an **HDEL** command instead of first recalling the files.

The requirements for this option are that the program name is IEFBR14 and the retention status of any files coded is **DELETE**.

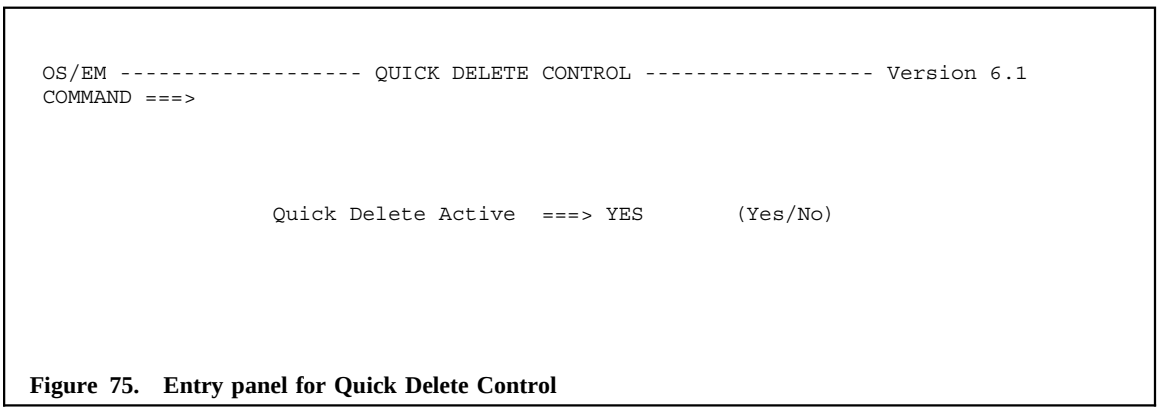

Figure 75. Entry panel for Quick Delete Control

Enter **YES** to enable the Quick Delete function or enter **NO** to disable it.

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Reblocking Control

While everyone acknowledges that files should be blocked for the optimum DASD efficiency, the task is rarely done. Sequential files can be automatically reblocked whenever they are recalled or recovered to DASD by DFHSM. The HSM Optimizer supports FULL through EIGHTH track reblocking, plus SYSTEM reblocking if your installation has level 3.+ of DFP installed.

As usual, the first field on the reblock panel (Figure 76) allows you to ENABLE or DISABLE this function. Select the reblocking factor of choice by entering an **S** in the CMD field and typing **YES** in the ENABLED field. Figure 76.

Reblocking is advantageous when migrating to new, higher capacity DASD devices; and to ensure that DASD utilization is optimal.

Note: If either your programs or JCL contain explicit block sizes, this function will cause job failure since the internal description of the file and your external description of it will not match. You should specify block sizes in the JCL, ONLY when first creating the file.

Reblock Control requires that the following DFHSM SETSYS option be present in DFHSM ARCCMDxx member.

```
SETSYS CONVERSION(REBLOCKTOANY)
```

Note: Refer to the DFHSM Systems Programmer's Guide for further information and discussion.

```
OS/EM --------------------- REBLOCK CONTROL ---------------------- Version 6.1
COMMAND ===>                                                  Scroll ===> CSR

   Enable Reblock Control ===> YES  (Enter YES to enable; NO to disable)

 (CMD = (S)elect for update; (G)roup display)

         REBLOCKING                    MINIMUM     EXCLUDED DSN
  CMD      FACTOR      ENABLED          SIZE          GROUPS
   "       SYSTEM
   "       FULL           YES
   "       HALF           YES              1           2
   "       THIRD
   "       FOURTH
   "       FIFTH
   "       SIXTH
   "       SEVENTH
   "       EIGHTH
****************************** Bottom of data ********************************
```

Figure 76. Reblock Control Menu

Field entry is as follows:

1. Enable Reblocking Control

   Each reblocking factor may be Enabled or Disabled. Each reblocking factor may specify a minimum dataset size which a dataset must equal or exceed before it is eligible for reblocking. Finally, you may create an EXCLUDE list of dataset name groups. Datasets resolved to this list will not be reblocked.

   Entering **YES** in this field will enable the OS/EM's extended processing.

   Entering **NO** will disable this function.

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2. Select Reblocking Factor

   SYSTEM

   System reblocking is available only on systems that have DFP 3.0 or higher.

   FULL

   Full track blocking depends on the target device. For those devices with a track size larger than 32760, such as the 3380, the resulting blocksize used will actually be HALF-track blocking. For devices with a track size smaller than 32760, the actual track size will be used.

   The actual block size used is determined by the device track size, whether the file contains fixed or variable length records, and DFHSM. The block size will not be adjusted by DFHSM if the file contains variable length records. The block size will become the maximum blocksize for the file.

   If the file contains fixed length records, DFHSM will adjust the block size downward until an even number of logical records will fit.

3. Enable

   Entering **YES** in this field will enable OS/EM's extended processing.

   Entering **NO** will disable this function.

4. Minimum Dataset Size

   If you wish to prevent small datasets from being reblocked, enter a **minimum dataset size** (in K bytes) to be reblocked. Blank this field to allow datasets of any size to be reblocked.

5. Excluded DSN Groups

   If you wish to exclude particular datasets from being reblocked by DFHSM, enter **G** in the CMD field. You will be presented with a pop-up window where you may enter the Dataset Name Groups which will be exempt from reblocking.

6. Add or Delete DSN Groups

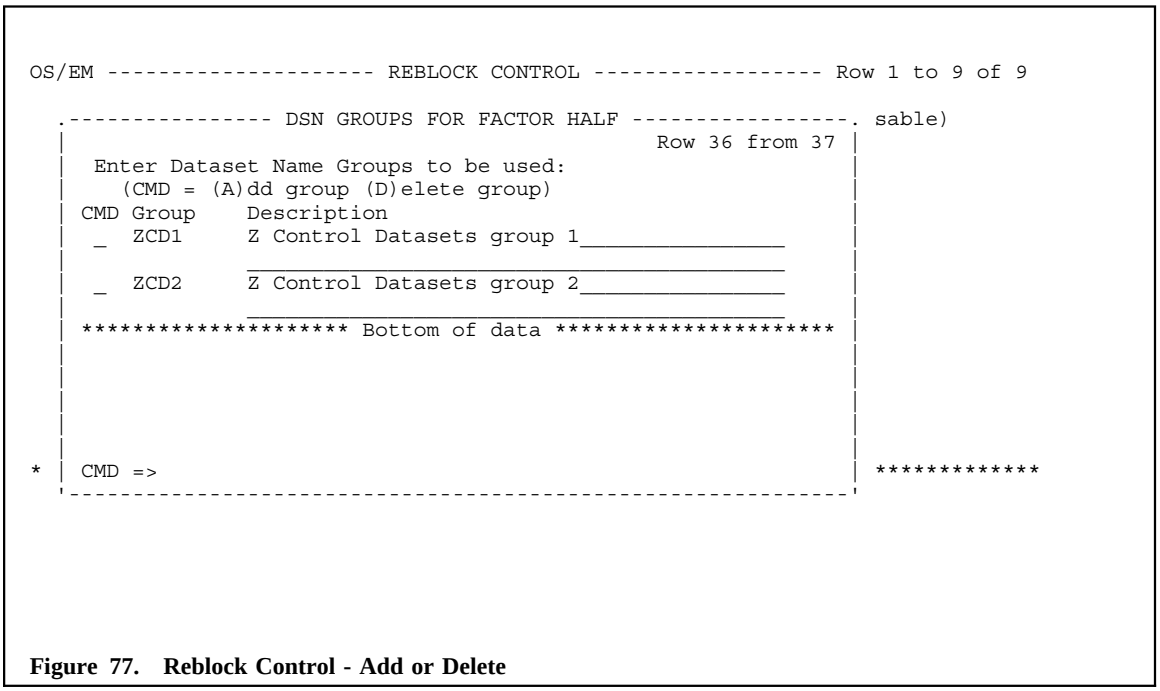

Figure 77. Reblock Control - Add or Delete

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Use the "POPUP" panel to add or delete the DSN Groups.

The area in which the group names are entered is a scrollable area. Normal ISPF commands for scrolling are in effect.

Group names are up to eight characters in length. They are created by using the Define Dataset Name Groups function (see “Define Dataset Name Groups” on page 5-3). Each group represents a set of dataset name masks or fully qualified dataset names.

Note: The dataset group names that you enter must have been properly defined by using the Define Dataset Name Groups option before they can be accepted on this panel.

- To add a dataset name group, enter an **A** in the CMD field and the name of the dataset name group in the group field. Overtype any existing entry - the old entry will not be altered.
- To delete an existing entry, enter a **D** in the CMD field.

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Recall/Recover Volume Selection

This option determines whether DFHSM RECALL/RECOVER will proceed according to the DASD allocation rules established with OS/EM's QuickPool option.

If the QuickPool option is in effect, you must enable this option. DFHSM RECALL/RECOVERY might fail if this option is not in effect; especially if you change the allocation rules after DFHSM has migrated or backed up the dataset.

Directed Recall requires that the following DFHSM SETSYS option be present in DFHSM ARCCMDxx member.

```
SETSYS RECALL(PRIVATE(UNLIKE))
```

Note: If the dataset is a DFSMS dataset this option will not be invoked. If QUICKPOOL allocation is in effect, you must specify DIRECTRECALL. DFHSM RECALL/RECOVERY will most likely fail if this option is not enabled.

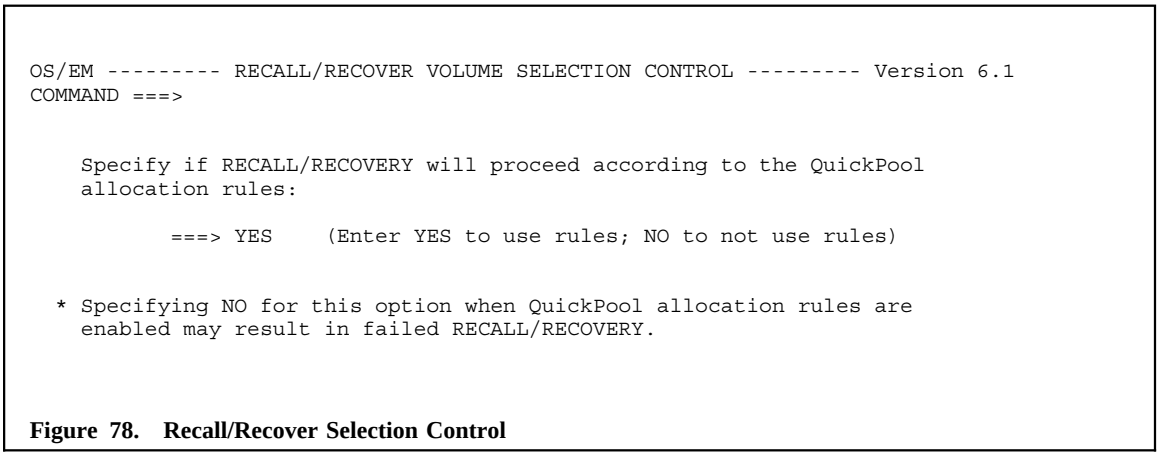

Figure 78. Recall/Recover Selection Control

Field entry is as follows:

1. Enable Recall/Recover Control

   Entering **YES** in this field will enable the OS/EM's extended processing.

   Entering **NO** will disable this function.

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HSM Optimizer Report System

Description

HSM Report System provides reports detailing the performance of the DFHSM component in both a Non-SMS and DFSMS environment utilizing the DFHSM SMF Function Statistic Records (FSR), Volume Statistic Records (VSR), and the Daily Statistic Records (DSR). A database of the DFHSM SMF records is maintained to provide both daily and historical reporting.

Summary of Features

- Dynamic Date Selection for Report Selection
- Summary DFHSM Error Report by Function, Return and Reason code
- Detail DFHSM Error Report by Function, Return and Reason code
- Dataset Activity Report details excessive Migration and Recall for datasets
- Primary Volume Summary Report
    - Available space
    - Space releasable
    - Last Backup date/time
    - Last Migration date/time
    - Last Dump date/time
    - Summary of volume utilization by DSORG
    - Type of Volume DFSMS or DFHSM
- Primary Volume Detail Report
    - Dataset Name
    - DSORG
    - Type of allocation (CYL, TRK, Megabytes, Kilobytes)
    - Space allocated
    - Space used
    - Space releasable
    - Number of extents
    - DFSMS managed
- Activity Summary Report utilizing the DSR records for the Reporting Period
    - Number of datasets migrated to ML1 and ML2
    - Number and percent datasets that failed migration to ML1 and ML2
    - Number of datasets recalled from ML1 and ML2
    - Number and percent datasets that failed recall from ML1 and ML2
    - Number of datasets backed up
    - Number and percent of datasets that failed backup
- Volume Summary Report utilizing the VSR records for the Reporting Period
    - Volume Utilization including minimum, maximum, and average
    - Number of datasets migrated
    - Number of datasets recalled
    - Number of datasets backed up
    - Number of datasets recovered
    - Date/time of last volume dump
- Detail Dataset movement reports

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    - Primary to ML1
    - ML1 to ML2
    - Primary to ML2
    - ML1 to Primary
    - ML2 to Primary
- Summaries of Dataset movement by Size and Age of dataset
    - Primary to ML1
    - ML1 to ML2
    - Primary to ML2
    - ML1 to Primary
    - ML2 to Primary
- Summary Reports on Migration Control Dataset (MCDS) by Age
- Summary Reports on Migration Control Dataset (BCDS) by Age
- Detail Reports on Migration Control Dataset (MCDS) by Age
- Detail Reports on Migration Control Dataset (BCDS) by Age
- Extensive ISPF interface

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HSM Optimizer Report XREF

Report Number	Report Name
REPORT-01	MIGRATION DETAIL (PRIMARY - ML1)
REPORT-02	MIGRATION DELAY SUMMARY (PRIMARY - ML1)
REPORT-03	MIGRATION AGE SUMMARY (PRIMARY - ML1)
REPORT-04	MIGRATION DETAIL (ML1 - ML2)
REPORT-05	MIGRATION DELAY SUMMARY (ML1 - ML2)
REPORT-06	MIGRATION AGE SUMMARY (ML1 - ML2)
REPORT-07	MIGRATION DETAIL (PRIMARY - ML2)
REPORT-08	MIGRATION DELAY SUMMARY (PRIMARY - ML2)
REPORT-09	MIGRATION AGE SUMMARY (PRIMARY - ML2)
REPORT-10	RECALL DETAIL (ML1 - PRIMARY)
REPORT-11	RECALL DELAY SUMMARY (ML1 - PRIMARY)
REPORT-12	RECALL AGE SUMMARY (ML1 - PRIMARY)
REPORT-13	RECALL DETAIL (ML2 - PRIMARY)
REPORT-14	RECALL DELAY SUMMARY (ML2 - PRIMARY)
REPORT-15	RECALL AGE SUMMARY (ML2 - PRIMARY)
REPORT-16	DFHSM DASD VOLUME SUMMARY
REPORT-17	PRIMARY DATASET ACTIVITY REPORT
REPORT-18	DFHSM ERROR DETAIL REPORT
REPORT-19	DFHSM ERROR SUMMARY REPORT
REPORT-20	ACTIVITY SUMMARY
REPORT-21	MIGRATED DATASET SUMMARY
REPORT-22	DATASET BACKUP SUMMARY
REPORT-23	PRIMARY VOLUMES
REPORT-24	PRIMARY VOLUME DETAIL
REPORT-25	PRIMARY VOLUME DATE REFERENCE DETAIL
REPORT-26	MIGRATED DATASET DETAIL (MCDS Sorted by DSN)
REPORT-27	BACKED UP DATASET DETAIL (BCDS Sorted by DSN With XREF)
REPORT-28	MIGRATED DATASET DETAIL (MCDS Sorted by Date)
REPORT-29	BACKED UP DATASET DETAIL (BCDS Sorted by Date with XREF)
REPORT-30	BACKED UP DATASET DETAIL (BCDS Sorted by DSN No XREF)
REPORT-31	BACKED UP DATASET DETAIL (BCDS Sorted by Date No XREF)

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DFHSM Report Descriptions

Report-01 MIGRATION DETAIL (Primary - ML1)

This report presents a list of all datasets migrated from primary storage to ML1 storage for the requested reporting period.

If you find very large datasets going to ML1, especially if they have low compression ratios, you might want to consider moving these datasets directly to ML2 storage (assuming this is tape in your installation). Such datasets impact ML1 utilization and might result in a ML1 to ML2 migration which will impact recall times for all datasets migrated.

```
HSM OPTIMIZER  6.1                          MIGRATION DETAIL (PRIMARY - ML1)                                          PAGE   3
REPORT: 01 FORMAT: 01                                02/10/02 - 02/12/02                    REPORT TIME: 12:14  DATE:  2/13/05

                                                                                  LAST   DATA
                                          FROM     TO              DATE     TIME    ACCESS   SET  READ WRITE CMP MGEMENT
DATASET NAME                             VOLUME  VOLUME  USER ID  COMPLETE COMPLETE   DATE    AGE BYTES BYTES PCT  CLASS

OSEM560.COMPAT56.BIN                     SMS528  HSM000  **HSM*** 02/10/02  5:09:53 02/04/02    6  642K  644K   0 SMP
GSA3.OP.RMMBK.BKP.RMMDB.G2452V00         SMS502  HSM000  **HSM*** 02/10/02 16:06:33 02/10/02    0 18.1M 18.1M   0 STD10YR
GSA4.AW.B8050.FIL.AW0BEEM                SMS506  HSM000  **HSM*** 02/10/02 16:07:06 02/10/02    0 1.93M 1.93M   0 STD10YR
GSA4.LG.B8050.FIL.LG0BMBR                SMS506  HSM000  **HSM*** 02/10/02 16:07:10 02/10/02    0 1.66M 1.66M   0 STD10YR
GSA4.SE.B8050.FIL.SE0BMBR                SMS502  HSM000  **HSM*** 02/10/02 16:11:02 02/10/02    0 13.5M 13.5M   0 STD10YR
GSA3.OP.RMMBK.BKP.RMMDB.G2453V00         SMS507  HSM000  **HSM*** 02/11/02  2:08:13 02/11/02    0 18.1M 18.1M   0 STD10YR
GSA2.PD.D2001.FIL.FLAT                   SMS505  HSM000  SPJRM    02/11/02 11:09:25 02/11/02    0  574K 94.0K  84 STD10YR
GSA7.LB.V0900.FIL.TESTFILE               SMS508  HSM000  **HSM*** 02/11/02 16:07:47 02/11/02    0 3.96M 3.96M   0 STD10YR
GSA2.SE.D2001.FIL.DOWNIRS                SMS508  HSM000  **HSM*** 02/11/02 16:08:06 02/11/02    0  767K  124K  84 STD10YR
GSA4.AI.B0902.FIL.LASTWRK                SMS506  HSM000  **HSM*** 02/12/02 17:06:04 02/12/02    0 1.34M 1.34M   0 STD10YR
GSA3.OP.SMFDM.BKP.SMF.G0003V00           SMS507  HSM000  **HSM*** 02/12/02 21:01:50 02/12/02    0 16.2M 16.2M   0 STD10YR
GSA7.IW.K0210.BKP.IWEEMST.G0069V00       SMS507  HSM000  **HSM*** 02/12/02 21:01:56 02/12/02    0 16.2M 16.2M   0 STD10YR
GSA7.LM.K0170.BKP.LMEEMST                SMS507  HSM000  **HSM*** 02/12/02 21:02:00 02/12/02    0 11.8M 11.8M   0 STD10YR
GSA7.FN.K0170.BKP.FNEEMST                SMS518  HSM000  **HSM*** 02/12/02 21:02:43 02/12/02    0 5.08M 5.08M   0 STD10YR
GSA7.LB.V0900.FIL.PRINTFIL               SMS518  HSM000  **HSM*** 02/12/02 21:02:46 02/12/02    0 4.87M 4.87M   0 STD10YR
GSA4.AI.B0941.FIL.ENRLBEN                SMS518  HSM000  **HSM*** 02/12/02 21:02:50 02/12/02    0 3.74M 3.75M   0 STD10YR
GSA2.ZZ.C1002.FIL.LTRTRANS.G3376V00      SMS518  HSM000  **HSM*** 02/12/02 21:02:54 02/12/02    0 2.53M  952K  63 STD10YR
GSA2.ZZ.C0000.BKP.QLMPSTG.G2657V00       SMS507  HSM000  **HSM*** 02/12/02 21:03:51 02/12/02    0 3.76M 3.05M  19 STD10YR
GSA4.OL.B0940.FIL.MBRINFO                SMS507  HSM000  **HSM*** 02/12/02 21:04:02 02/12/02    0 5.78M 5.78M   0 STD10YR
```

Figure 79. REPORT-01 MIGRATION DETAIL (Primary - ML1)

The report contains the following data:

- Dataset Name
- The primary DASD volume the dataset was migrated from
- The DFHSM ML1 DASD volume the dataset was migrated to
- The userid requesting the migration. This will usually be **HSM**, indicating that the dataset was migrated because it met your current automatic migration criteria. If some other ID is listed, it is the ID of the user who specifically requested the dataset to be migrated.
- The date the migration request was completed.
- The time the migration request was completed.
- The date the dataset was last referenced. Remember, this date is not necessarily the date the dataset was last updated.
- The dataset age in days. It is the difference between the migration completed date and the last referenced date.
- The number of bytes read.
- The number of bytes written by DFHSM.
- The compression percentage achieved by DFHSM, assuming that you've activated DFHSM data compression. Files smaller than 2K will always result in DFHSM writing a 2K file. If you are not

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already using DFHSM's Small Dataset Packing feature, you should seriously consider doing so if you have many such small files.

DFSMS Management Class

Report-02 MIGRATION DELAY SUMMARY (Primary - ML1)

This report presents a summary, by dataset size, of delays in migrating datasets. Delays usually occur when all defined DFHSM migration tasks are currently busy. Unless the average delay seems overly long, do not be too concerned with the values reported. If the average delays do seem overly long, you might want to consider allowing more concurrent DFHSM migration tasks.

```
HSM OPTIMIZER  6.1                        MIGRATION DELAY SUMMARY (PRIMARY - ML1)                                    PAGE   2
REPORT: 02 FORMAT: 02                                02/01/02 - 03/31/02                    REPORT TIME:  8:36  DATE:  3/18/02
```

DATASET SIZE	NUMBER OF REQUESTS	PERCENT OF TOTAL REQUESTS	TOTAL WAIT TIME	PERCENT OF TOTAL WAIT TIME	AVERAGE WAIT TIME	TOTAL BYTES READ	TOTAL BYTES WRITTEN	AVERAGE PERCENT COMPRESSION	TOTAL CPU TIME
25.0K	45	4	0:03:52	2	0:00:05	49.9K	92.0K	0	0:00:21.89
50.0K	31	2	0:02:16	1	0:00:04	1.25M	132K	90	0:00:14.83
75.0K	14	1	0:01:22	1	0:00:06	840K	524K	38	0:00:07.04
100K	16	1	0:01:20	1	0:00:05	1.39M	414K	71	0:00:07.97
250K	52	4	0:04:22	3	0:00:05	8.16M	2.56M	69	0:00:26.50
500K	43	3	0:03:51	2	0:00:05	15.3M	2.81M	82	0:00:24.27
750K	43	3	0:09:09	6	0:00:13	25.9M	9.17M	65	0:00:26.88
1024K	52	4	0:05:07	3	0:00:06	46.0M	17.3M	62	0:00:34.60
1.50M	116	9	0:11:17	7	0:00:06	140M	97.0M	31	0:01:17.24
2.00M	83	6	0:08:13	5	0:00:06	147M	98.8M	33	0:00:56.27
3.00M	91	7	0:09:29	6	0:00:06	226M	175M	23	0:01:00.55
4.00M	76	6	0:07:51	5	0:00:06	270M	195M	28	0:00:51.28
5.00M	70	5	0:07:40	5	0:00:07	311M	229M	26	0:00:46.82
7.50M	115	9	0:12:22	8	0:00:06	685M	616M	10	0:01:15.52
10.0M	99	8	0:13:58	9	0:00:08	885M	794M	10	0:01:05.33
20.0M	285	22	0:40:50	26	0:00:09	4.25G	4.08G	4	0:03:10.89
30.0M	42	3	0:08:10	5	0:00:12	917M	862M	6	0:00:30.05
40.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
50.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
75.0M	1	0	0:00:26	0	0:00:26	74.1M	74.1M	0	0:00:00.66
100M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
OVER	4	0	0:05:48	4	0:01:27	1.45G	1.45G	0	0:00:03.52
TOTAL	1,278		2:37:23			9.37G	8.63G		0:13:42.11

Figure 80. REPORT-02 MIGRATION DELAY SUMMARY (Primary - ML1)

The migration delay summary report contains the following data:

- Dataset size.
- The number of migration requests for the dataset size.
- The percentage of the total migration requests this dataset size represents.
- The total wait time for these datasets.
- The percent of the total wait time datasets of this size represent.
- The average wait time for each individual request of this dataset size.
- The total bytes read.
- The total bytes written to ML1 storage.
- The average compression achieved.
- The total CPU time used for datasets of this size.

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Report-03 MIGRATION AGE SUMMARY (Primary - ML1)

This report presents a summary, by dataset age, of all datasets migrated during the reporting period.

This report will help you pinpoint problems with your current aging strategy, if any. For example, a report may show 45 requests for datasets that have not been referenced within 50 days. It may also show 2,487 requests for a dataset age of 2. If the total bytes read for the age 50 datasets is fairly large, when compared to the total bytes read for the age 2 datasets, you may be holding such datasets on primary storage for too long a period.

HSM OPTIMIZER 6.1 MIGRATION AGE SUMMARY (PRIMARY - ML1) PAGE 3
REPORT: 03 FORMAT: 03 02/01/02 - 03/31/02 REPORT TIME: 8:36 DATE: 3/18/02

DATASET AGE	NUMBER OF REQUESTS	PERCENT OF REQUESTS	CUMULATIVE REQUESTS	CUMULATIVE PERCENT	TOTAL BYTES READ	TOTAL BYTES WRITTEN	TOTAL CPU TIME
1	1,251	98	1,251	98	9.33G	8.61G	0:13:24.36
2	0	0	1,251	98	0.00K	0.00K	0:00:00.00
3	8	1	1,259	99	944K	144K	0:00:03.95
4	1	0	1,260	99	5.83M	5.83M	0:00:00.68
5	0	0	1,260	99	0.00K	0.00K	0:00:00.00
6	5	0	1,265	99	2.57M	2.58M	0:00:02.06
7	0	0	1,265	99	0.00K	0.00K	0:00:00.00
8	1	0	1,266	99	110K	112K	0:00:00.45
9	0	0	1,266	99	0.00K	0.00K	0:00:00.00
10	6	0	1,272	100	17.0M	7.11M	0:00:06.35
15	3	0	1,275	100	4.26M	620K	0:00:02.09
20	1	0	1,276	100	97.2K	74.0K	0:00:00.48
25	0	0	1,276	100	0.00K	0.00K	0:00:00.00
30	2	0	1,278	100	8.47M	446K	0:00:01.69
40	0	0	1,278	100	0.00K	0.00K	0:00:00.00
50	0	0	1,278	100	0.00K	0.00K	0:00:00.00
60	0	0	1,278	100	0.00K	0.00K	0:00:00.00
70	0	0	1,278	100	0.00K	0.00K	0:00:00.00
80	0	0	1,278	100	0.00K	0.00K	0:00:00.00
90	0	0	1,278	100	0.00K	0.00K	0:00:00.00
100	0	0	1,278	100	0.00K	0.00K	0:00:00.00
125	0	0	1,278	100	0.00K	0.00K	0:00:00.00
150	0	0	1,278	100	0.00K	0.00K	0:00:00.00
175	0	0	1,278	100	0.00K	0.00K	0:00:00.00
200	0	0	1,278	100	0.00K	0.00K	0:00:00.00
250	0	0	1,278	100	0.00K	0.00K	0:00:00.00
300	0	0	1,278	100	0.00K	0.00K	0:00:00.00
350	0	0	1,278	100	0.00K	0.00K	0:00:00.00
400	0	0	1,278	100	0.00K	0.00K	0:00:00.00
450	0	0	1,278	100	0.00K	0.00K	0:00:00.00
500	0	0	1,278	100	0.00K	0.00K	0:00:00.00
600	0	0	1,278	100	0.00K	0.00K	0:00:00.00
700	0	0	1,278	100	0.00K	0.00K	0:00:00.00
800	0	0	1,278	100	0.00K	0.00K	0:00:00.00
900	0	0	1,278	100	0.00K	0.00K	0:00:00.00
1000	0	0	1,278	100	0.00K	0.00K	0:00:00.00
1250	0	0	1,278	100	0.00K	0.00K	0:00:00.00
1500	0	0	1,278	100	0.00K	0.00K	0:00:00.00
1750	0	0	1,278	100	0.00K	0.00K	0:00:00.00
2000	0	0	1,278	100	0.00K	0.00K	0:00:00.00
OVER	0	0	1,278	100	0.00K	0.00K	0:00:00.00
TOTAL	1,278		1,278		9.37G	8.63G	0:13:42.11

Figure 81. REPORT-03 MIGRATION AGE SUMMARY (Primary - ML1)

The Migration Age Summary Report contains the following data:

- The dataset age in days.
- The number of migration requests for the dataset age.
- The percentage of the total requests this age represents.
- Cumulative requests.
- A cumulative percentage.
- Total bytes read.
- Total bytes written.
- Total CPU time used for these requests.

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Report-04 MIGRATION DETAIL (ML1 - ML2)

This report presents a listing of all datasets migrated from DFHSM ML1 storage to ML2 storage (this is usually tape in most installations).

```
HSM OPTIMIZER  6.1                          MIGRATION DETAIL (ML1 - ML2)                                  PAGE   4
REPORT: 04 FORMAT: 01                             01/16/02 - 02/13/02                  REPORT TIME: 13:00  DATE:  2/14/02

                                                                                    LAST   DATA
                                  FROM     TO                    DATE     TIME    ACCESS   SET  READ WRITE CMP MGEMENT
DATASET NAME                      VOLUME   VOLUME  USER ID     COMPLETE COMPLETE  DATE     AGE BYTES BYTES PCT  CLASS

GSA5.LB.P0301.FIL.LB1PSSN         HSM000   031230  **HSM***  01/30/02  4:55:40 01/29/02    1 4.01M 4.01M   0 STD10YR
GSA5.LB.P0301.FIL.PPSORT          HSM000   031230  **HSM***  01/30/02  4:55:49 01/29/02    1 10.8M 10.8M   0 STD10YR
GSA5.LB.P0302.BKP.FICHE.G0004V00  HSM000   031230  **HSM***  01/30/02  4:55:51 01/07/02   23 1.02M 1.02M   0 STD10YR
GSA5.LB.P0302.BKP.FICHE.G0005V00  HSM000   031230  **HSM***  01/30/02  4:55:53 01/29/02    1 1.02M 1.02M   0 STD10YR
GSA5.LB.P0360.FIL.CKAFP           HSM000   031230  **HSM***  01/30/02  4:56:02 01/29/02    1 10.8M 10.8M   0 STD10YR
GSA5.LC.P0101.BKP.LC1PPEN.G0031V00 HSM000  031230  **HSM***  01/30/02  4:56:05 01/14/02   16 1.93M 1.93M   0 STD10YR
GSA5.LC.P5030.BKP.LC1PPTR.G0796V00 HSM000  031230  **HSM***  01/30/02  4:56:34 01/29/02    1 14.7M 14.7M   0 STD10YR
GSA5.OI.A5150.FIL.OI1ADET         HSM000   031230  **HSM***  01/30/02  4:56:37 01/07/02   23 1.61M 1.61M   0 STD10YR
GSA5.OI.P0201.BKP.OI1PPEN         HSM000   031230  **HSM***  01/30/02  4:56:39 01/22/02    8 1.29M 1.29M   0 STD10YR
GSA5.OI.P5000.BKP.OI1PPTR.G0034V00 HSM000  031230  **HSM***  01/30/02  4:56:51 01/24/02    6 13.7M 13.7M   0 STD10YR
GSA5.OI.P5030.BKP.OI1PPTR.G0972V00 HSM000  031232  **HSM***  01/30/02  4:59:35 01/29/02    1 13.7M 13.7M   0 STD10YR
GSA5.OT.P0301.FIL.OT1PSSN         HSM000   031232  **HSM***  01/30/02  4:59:39 01/23/02    7 4.82M 4.82M   0 STD10YR
GSA5.OT.P0375.FIL.VHAFP           HSM000   031232  **HSM***  01/30/02  4:59:51 01/23/02    7 11.9M 11.9M   0 STD10YR
GSA5.OT.P5092.FIL.FED1099.G0002V00 HSM000  031232  **HSM***  01/30/02  4:59:54 01/28/02    2 1.80M 1.80M   0 STD10YR
GSA5.OU.P2260.BKP.OU1PPTR         HSM000   031232  **HSM***  01/30/02  4:59:58 01/11/02   19 3.69M 3.69M   0 STD10YR
GSA5.PH.P0360.FIL.CKAFP           HSM000   031232  **HSM***  01/30/02  5:00:04 01/23/02    7 4.39M 4.39M   0 STD10YR
GSA5.SW.P5030.BKP.SW1PPTR.G0689V00 HSM000  031233  **HSM***  01/30/02  5:06:39 01/29/02    1 13.1M 13.1M   0 STD10YR
GSA5.SY.P2260.BKP.SY1PPTR         HSM000   031233  **HSM***  01/30/02  5:06:45 01/22/02    8 5.08M 5.08M   0 STD10YR
GSA5.SY.P2260.BKP.SY1P0201        HSM000   031233  **HSM***  01/30/02  5:06:50 01/28/02    2 5.03M 5.03M   0 STD10YR
GSA5.UA.P5030.BKP.UA1PPTR.G0838V00 HSM000  031233  **HSM***  01/30/02  5:07:03 01/25/02    5 14.7M 14.7M   0 STD10YR
GSA5.UA.P5030.BKP.UA1PPTR.G0841V00 HSM000  031233  **HSM***  01/30/02  5:07:14 01/29/02    1 14.7M 14.7M   0 STD10YR
GSA5.WS.P0304.FIL.WSALPHA         HSM000   031233  **HSM***  01/30/02  5:07:29 01/24/02    6 1.66M 1.66M   0 STD10YR
GSA5.WS.P2260.FIL.SORTED          HSM000   031233  **HSM***  01/30/02  5:07:44 01/11/02   19 18.7M 18.7M   0 STD10YR
GSA5.WS.P5030.BKP.WS1PPTR.G0934V00 HSM000  031233  **HSM***  01/30/02  5:07:58 01/22/02    8 19.0M 19.0M   0 STD10YR
GSA5.WS.P5092.FIL.FED1099.G0003V00 HSM000  031233  **HSM***  01/30/02  5:08:14 01/23/02    7  184K  184K   0 STD10YR
```

Figure 82. REPORT-04 MIGRATION DETAIL (ML1 - ML2)

The report contains the following data:

- Dataset Name
- The primary DASD volume the dataset was migrated from
- The DFHSM ML1 DASD volume the dataset was migrated to
- The userid requesting the migration. This will usually be **HSM**, indicating that the dataset was migrated because it met your current automatic migration criteria. If some other ID is listed, it is the ID of the user who specifically requested the dataset to be migrated.
- The date the migration request was completed.
- The time the migration request was completed.
- The date the dataset was last referenced. Remember, this date is not necessarily the date the dataset was last updated.
- The dataset age in days. It is the difference between the migration completed date and the last referenced date.
- The number of bytes read.
- The number of bytes written by DFHSM.
- The compression percentage achieved by DFHSM, assuming that you've activated DFHSM data compression. Files smaller than 2K will always result in DFHSM writing a 2K file. If you are not already using DFHSM's Small Dataset Packing feature, you should seriously consider doing so if you have many such small files.
- DFSMS Management Class for this dataset.

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Report-05 MIGRATION DELAY SUMMARY (ML1 - ML2)

This report presents a summary, by dataset size, of all datasets migrated from DFHSM ML1 storage to ML2 storage and the wait time associated with the migration requests.

If most of your migration activity seems to be concentrated in datasets of small to medium size, you might want to investigate the Migration Detail report, paying particular attention to datasets of small size. Migrating small datasets really doesn't buy that much especially if they must be recalled in a short period of time.

HSM OPTIMIZER 6.1 MIGRATION DELAY SUMMARY (ML1 - ML2) PAGE 4
REPORT: 05 FORMAT: 02 02/01/02 - 03/31/02 REPORT TIME: 8:36 DATE: 3/18/02

DATASET SIZE	NUMBER OF REQUESTS	PERCENT OF TOTAL REQUESTS	TOTAL WAIT TIME	PERCENT OF TOTAL WAIT TIME	AVERAGE WAIT TIME	TOTAL BYTES READ	TOTAL BYTES WRITTEN	AVERAGE PERCENT COMPRESSION	TOTAL CPU TIME
25.0K	58	6	0:01:01	0	0:00:01	560K	560K	0	0:00:02.38
50.0K	29	3	0:02:27	1	0:00:05	1002K	1002K	0	0:00:01.50
75.0K	30	3	0:00:35	0	0:00:01	1.82M	1.82M	0	0:00:02.09
100K	15	2	0:00:17	0	0:00:01	1.36M	1.36M	0	0:00:01.26
250K	38	4	0:43:30	11	0:01:09	6.09M	6.09M	0	0:00:03.34
500K	28	3	0:02:60	1	0:00:06	10.4M	10.4M	0	0:00:02.78
750K	14	2	0:00:26	0	0:00:02	8.52M	8.52M	0	0:00:01.42
1024K	26	3	0:00:47	0	0:00:02	22.8M	22.8M	0	0:00:02.86
1.50M	77	9	0:10:36	3	0:00:08	91.1M	91.1M	0	0:00:09.22
2.00M	44	5	0:01:56	0	0:00:03	76.4M	76.4M	0	0:00:06.06
3.00M	65	7	0:13:44	3	0:00:13	159M	159M	0	0:00:10.83
4.00M	41	5	0:05:17	1	0:00:08	140M	140M	0	0:00:07.92
5.00M	34	4	0:05:31	1	0:00:10	150M	150M	0	0:00:08.35
7.50M	87	10	0:33:01	8	0:00:23	520M	520M	0	0:00:24.74
10.0M	66	7	0:24:10	6	0:00:22	592M	592M	0	0:00:25.99
20.0M	204	23	1:55:35	29	0:00:34	3.02G	3.02G	0	0:02:01.95
30.0M	34	4	0:29:45	7	0:00:53	742M	742M	0	0:00:28.30
40.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
50.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
75.0M	1	0	0:05:57	1	0:05:57	74.1M	74.1M	0	0:00:02.78
100M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
OVER	4	0	1:41:08	25	0:25:17	1.45G	1.45G	0	0:00:50.27
TOTAL	895		6:38:41			7.01G	7.01G		0:05:14.04

Figure 83. REPORT-05 MIGRATION DELAY SUMMARY (ML1 - ML2)

The Migration Delay Summary Report contains the following data:

- The dataset size.
- Number of requests.
- Percent of total requests.
- Total wait time.
- Percent of total wait time.
- Average wait time.
- Total bytes read.
- Total bytes written.
- Average percent compression.
- Total CPU time.

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Report-06 MIGRATION AGE SUMMARY (ML1 - ML2)

This report presents a summary, by dataset age, of all datasets migrated from DFHSM ML1 storage to ML2 storage.

This report will help you pinpoint problems with your current aging strategy, if any. For example, a report may show 45 requests for datasets that have not been referenced within 50 days. It may also show 2,487 requests for a dataset age of 2. If the total bytes read for the age 50 datasets is fairly large, when compared to the total bytes read for the age 2 datasets, you may be holding such datasets on primary storage for too long a period.

If the bulk of your requests are concentrated at low aging factors, either your current DFHSM aging is very aggressive or your DASD is limited and you must continually migrate. You should also take a close look at your ARCCMDxx member or your ACS parameters and determine whether an excessive number of datasets are being excluded from the migration process. Such datasets limit the amount of primary storage under DFHSM management, and probably cause excessive migration for the remaining datasets.

```
HSM OPTIMIZER  6.1                          MIGRATION AGE SUMMARY (ML1 - ML2)                                    PAGE   5
REPORT: 06 FORMAT: 03                              02/01/02 - 03/31/02                  REPORT TIME:  8:36  DATE:  3/18/02

                          NUMBER       PERCENT                                  TOTAL      TOTAL      TOTAL
                DATASET     OF           OF       CUMULATIVE     CUMULATIVE     BYTES      BYTES       CPU
                  AGE     REQUESTS     REQUESTS     REQUESTS       PERCENT       READ     WRITTEN      TIME

                    1        315          35           315            35        3.47G      3.47G    0:02:26.53
                    2        121          14           436            49         778M       778M    0:00:35.13
                    3        104          12           540            60         631M       631M    0:00:29.68
                    4         39           4           579            65         353M       353M    0:00:16.20
                    5         65           7           644            72         494M       494M    0:00:21.92
                    6         21           2           665            74        59.4M      59.4M    0:00:03.21
                    7         20           2           685            77        47.5M      47.5M    0:00:02.68
                    8         24           3           709            79        80.6M      80.6M    0:00:04.32
                    9         27           3           736            82         151M       151M    0:00:07.17
                   10          0           0           736            82        0.00K      0.00K    0:00:00.00
                   15        125          14           861            96         887M       887M    0:00:39.44
                   20         26           3           887            99         132M       132M    0:00:06.84
                   25          0           0           887            99        0.00K      0.00K    0:00:00.00
                   30          0           0           887            99        0.00K      0.00K    0:00:00.00
                   40          8           1           895           100        7.01M      7.01M    0:00:00.92
                   50          0           0           895           100        0.00K      0.00K    0:00:00.00
                   60          0           0           895           100        0.00K      0.00K    0:00:00.00
                   70          0           0           895           100        0.00K      0.00K    0:00:00.00
                   80          0           0           895           100        0.00K      0.00K    0:00:00.00
                   90          0           0           895           100        0.00K      0.00K    0:00:00.00
                  100          0           0           895           100        0.00K      0.00K    0:00:00.00
     ---          ---                  ---              ---             ---                ---
                  450          0           0           895           100        0.00K      0.00K    0:00:00.00
                  500          0           0           895           100        0.00K      0.00K    0:00:00.00
                  600          0           0           895           100        0.00K      0.00K    0:00:00.00
                  700          0           0           895           100        0.00K      0.00K    0:00:00.00
                  800          0           0           895           100        0.00K      0.00K    0:00:00.00
                  900          0           0           895           100        0.00K      0.00K    0:00:00.00
                 1000          0           0           895           100        0.00K      0.00K    0:00:00.00
                 1250          0           0           895           100        0.00K      0.00K    0:00:00.00
                 1500          0           0           895           100        0.00K      0.00K    0:00:00.00
                 1750          0           0           895           100        0.00K      0.00K    0:00:00.00
                 2000          0           0           895           100        0.00K      0.00K    0:00:00.00
                 OVER          0           0           895           100        0.00K      0.00K    0:00:00.00

                TOTAL        895                       895                      7.01G      7.01G    0:05:14.04
```

Figure 84. REPORT-06 MIGRATION AGE SUMMARY (ML1 - ML2)

The Migration Age Summary Report contains the following data:

- The dataset age in days.
- The number of migration requests for the dataset age.
- The percentage of the total requests this are represents.
- Cumulative requests.
- A cumulative percentage.
- Total bytes read.

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- Total bytes written.
- Total CPU Time.

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Report-07 MIGRATION DETAIL (PRIMARY - ML2)

This report presents a listing of all datasets migrated from DFHSM storage directly to ML2 storage (this is usually tape in most installations). It presents the same information shown for migration from primary to ML1 storage. Such migration is usually explicitly requested since the normal migration path is from primary to ML1 to ML2. Datasets on this report would be likely candidates for the Optimizer's Direct-to-ML2 support.

```
HSM OPTIMIZER  6.1                          MIGRATION DETAIL (PRIMARY - ML2)                                PAGE  30
REPORT: 07 FORMAT: 01                              02/10/02 - 02/12/02                  REPORT TIME: 12:14  DATE:  2/13/02

                                                                                    LAST   DATA
                                      FROM     TO                    DATE     TIME  ACCESS   SET  READ WRITE CMP MGEMENT
DATASET NAME                          VOLUME   VOLUME  USER ID       COMPLETE COMPLETE DATE     AGE BYTES BYTES PCT  CLASS

GSA2.ZZ.D8509.FIL.VCHRS.G3245V00      SMS507   029656  **HSM*** 02/12/02 21:13:40 02/01/02   11 0.84K 0.84K   0 STD10YR
GSA2.ZZ.D8406.FIL.FIYRECON.G2963V00   SMS507   029656  **HSM*** 02/12/02 21:13:43 02/01/02   11 0.84K 0.84K   0 STD10YR
GSA4.XI.B1014.FIL.LOSELIG             SMS507   029656  **HSM*** 02/12/02 21:13:46 02/01/02   11 55.5K 55.5K   0 STD10YR
GSA2.ZZ.D8406.FIL.SNWRECON.G1570V00   SMS507   029656  **HSM*** 02/12/02 21:13:50 02/01/02   11 16.5K 16.5K   0 STD10YR
GSA2.ZZ.M0406.FIL.FIBRECON.G3308V00   SMS507   029656  **HSM*** 02/12/02 21:13:53 02/05/02    7 0.84K 0.84K   0 STD10YR
GSA2.ZZ.D8406.FIL.USBRECON.G1014V00   SMS507   029656  **HSM*** 02/12/02 21:13:56 02/02/02   10 7.44K 7.44K   0 STD10YR
GSA2.PI.X3002.FIL.PIXWLF.G1225V00     SMS507   029656  **HSM*** 02/12/02 21:13:59 02/02/02   10 0.84K 0.84K   0 STD10YR
GSA2.ZZ.M0406.FIL.CITRECON.G3304V00   SMS507   029656  **HSM*** 02/12/02 21:14:02 02/01/02   11 0.84K 0.84K   0 STD10YR
GSA2.ZZ.M0406.FIL.WLFCTL.G2010V00     SMS507   029656  **HSM*** 02/12/02 21:14:05 02/01/02   11 2.52K 2.52K   0 STD10YR
GSA2.ZZ.C3502.FIL.LOUISVL.G1326V00    SMS507   029656  **HSM*** 02/12/02 21:14:08 02/03/02    9 43.7K 43.7K   0 STD10YR
GSA2.ZZ.M0406.FIL.FRERECON.G0202V00   SMS507   029656  **HSM*** 02/12/02 21:14:11 02/05/02    7 14.8K 14.8K   0 STD10YR
GSA5.BK.P0315.FIL.BKRECON             SMS507   029656  **HSM*** 02/12/02 21:14:14 01/28/02   15 55.5K 55.5K   0 STD10YR
GSA2.ZZ.D8406.FIL.BOARECON.G2182V00   SMS507   029656  **HSM*** 02/12/02 21:14:17 02/02/02   10 0.84K 0.84K   0 STD10YR
GSA2.ZZ.D8406.FIL.FINRECON.G2186V00   SMS507   029656  **HSM*** 02/12/02 21:14:20 02/02/02   10 0.84K 0.84K   0 STD10YR
GSA2.ZZ.D8406.FIL.WLFRECON.G1976V00   SMS507   029656  **HSM*** 02/12/02 21:14:23 02/02/02   10 2.52K 2.52K   0 STD10YR
GSA2.ZZ.M0406.FIL.UBSRECON.G2954V00   SMS507   029656  **HSM*** 02/12/02 21:14:26 02/02/02   10 0.84K 0.84K   0 STD10YR
GSAC.Z0.I1010.FIL.SELJRNL.G2153V00    SMS507   029656  **HSM*** 02/12/02 21:14:29 02/02/02   10 55.5K 55.5K   0 TEST
GSA7.MA.K8520.FIL.MTDMAINT.G0460V00   SMS507   029656  **HSM*** 02/12/02 21:14:32 02/04/02    8 0.84K 0.84K   0 STD10YR
GSA2.TD.R2001.FIL.FLAT                SMS507   029656  **HSM*** 02/12/02 21:14:58 01/28/02   15 15.5K 15.5K   0 STD10YR
GSA2.ZZ.M0406.FIL.LSBRECON.G2350V00   SMS518   029656  **HSM*** 02/12/02 22:03:38 01/29/02   14 0.84K 0.84K   0 STD10YR
GSA7.PP.K1790.FIL.UPKMSTR             SMS563   031611  **HSM*** 02/12/02 22:06:39 02/12/02    0 95.1M 95.1M   0 STD10YR
GSA4.AI.B8050.FIL.AI0BMBR             SMS563   031611  **HSM*** 02/12/02 22:07:19 02/10/02    2 79.6M 79.6M   0 STD10YR
ATP3.LB.BABPA.FIL.ER.HISTORY.L18      SMS560   029593* **HSM*** 02/12/02 22:08:32 02/12/02    0  399M  399M   0 STDMTLY
                                      SMS559   031208  **HSM*** 02/12/02 23:03:19 02/11/02    1 1.55M 1.55M   0 STD10YR
                                      SMS559   031276  **HSM*** 02/12/02 23:03:45 02/11/02    1 16.0M 16.0M   0 STD10YR
GSA5.UA.A0890.BKP.UA1APEN             SMS503   031612  **HSM*** 02/12/02 23:09:11 02/09/02    3 20.2M 20.2M   0 STD10YR
GSA4.PL.B8050.FIL.PL0BMBR             SMS503   031612  **HSM*** 02/12/02 23:09:29 02/10/02    2 32.8M 32.8M   0 STD10YR
GSA5.PP.A0890.BKP.PP1APEN             SMS503   031612  **HSM*** 02/12/02 23:09:40 02/09/02    3 18.4M 18.4M   0 STD10YR
GSA1.Z0.I9991.FIL.CNTLM               SMS503   031612  **HSM*** 02/12/02 23:09:45 02/09/02    3 23.4M 23.4M   0 STD10YR
GSA5.AI.P5035.BKP.AI1PPTR.G0160V00    SMS559   014583  **HSM*** 02/12/02 23:13:07 02/11/02    1  119M  119M   0 STD10YR
GSA5.PJ.A0890.BKP.PJ1APEN             SMS559   014583  **HSM*** 02/12/02 23:13:29 02/09/02    3 37.6M 37.6M   0 STD10YR

               TOTAL RECORDS:     1,059

                                        *  DATASET EXISTS ON MULTIPLE TAPE VOLUMES
```

Figure 85. REPORT-07 MIGRATION DETAIL (PRIMARY - ML2)

The report contains the following data:

- Dataset Name
- The primary DASD volume the data was migrated from.
- The tape volume the dataset was migrated to.
- The user ID requesting the migration. This will usually be **HSM***, indicating that the dataset was migrated because it met your current automatic migration criteria. If some other ID is listed, it is the ID of the user who specifically requested the dataset to be migrated.
- The date the migration request was completed.
- The time the migration request was completed.
- The date the dataset was last referenced. Remember, this date is not necessarily the date the dataset was last updated.
- The dataset age in days. It is the difference between the migration completed date and the last referenced date.
- The number of bytes read.

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- The number of bytes written by DFHSM.
- The DFSMS Management Class of the dataset.

Report-08 MIGRATION DELAY SUMMARY (PRIMARY - ML2)

This report presents a summary, by dataset size, of all datasets migrated from DFHSM primary storage to ML2 storage.

HSM OPTIMIZER 6.1 — MIGRATION DELAY SUMMARY (PRIMARY - ML2) — PAGE 6
REPORT: 08 FORMAT: 02 — 02/01/02 - 03/31/02 — REPORT TIME: 8:36 DATE: 3/18/02

DATASET SIZE	NUMBER OF REQUESTS	PERCENT OF TOTAL REQUESTS	TOTAL WAIT TIME	PERCENT OF TOTAL WAIT TIME	AVERAGE WAIT TIME	TOTAL BYTES READ	TOTAL BYTES WRITTEN	AVERAGE PERCENT COMPRESSION	TOTAL CPU TIME
25.0K	3,381	24	5:16:35	5	0:00:06	13.7M	13.7M	0	0:27:30.16
50.0K	801	6	1:16:30	1	0:00:06	31.8M	31.8M	0	0:06:27.06
75.0K	1,430	10	2:22:49	2	0:00:06	77.6M	77.6M	0	0:11:40.36
100K	138	1	0:14:28	0	0:00:06	11.8M	11.8M	0	0:01:05.26
250K	1,408	10	2:04:09	2	0:00:05	203M	203M	0	0:10:55.18
500K	1,117	8	1:30:13	1	0:00:05	399M	399M	0	0:08:46.86
750K	478	3	1:09:60	1	0:00:09	294M	294M	0	0:03:45.88
1024K	363	3	0:35:33	1	0:00:06	311M	311M	0	0:02:52.92
1.50M	625	4	1:03:40	1	0:00:06	775M	775M	0	0:04:43.13
2.00M	324	2	0:44:02	1	0:00:08	568M	568M	0	0:02:26.64
3.00M	506	4	1:09:48	1	0:00:08	1.23G	1.23G	0	0:04:13.98
4.00M	312	2	0:56:30	1	0:00:11	1.07G	1.07G	0	0:02:46.30
5.00M	327	2	1:07:44	1	0:00:12	1.44G	1.44G	0	0:02:38.94
7.50M	476	3	2:13:34	2	0:00:17	2.79G	2.79G	0	0:04:11.24
10.0M	327	2	2:06:50	2	0:00:23	2.80G	2.80G	0	0:02:54.47
20.0M	835	6	9:07:21	9	0:00:39	11.9G	11.9G	0	0:08:41.34
30.0M	245	2	4:55:47	5	0:01:12	5.96G	5.96G	0	0:03:03.84
40.0M	165	1	3:31:30	3	0:01:17	5.36G	5.36G	0	0:02:24.93
50.0M	192	1	5:14:53	5	0:01:38	8.16G	8.16G	0	0:04:42.27
75.0M	238	2	9:16:57	9	0:02:20	14.3G	14.3G	0	0:04:43.34
100M	173	1	12:42:59	12	0:04:25	15.1G	15.1G	0	0:03:55.10
OVER	273	2	34:35:39	33	0:07:36	58.1G	58.1G	0	0:21:36.71
TOTAL	14,134		103:17:31			130G	130G		2:26:05.91

Figure 86. REPORT-08 MIGRATION DELAY SUMMARY (PRIMARY - ML2)

The migration delay summary report contains the following data:

- Dataset size.
- The number of migration requests for the dataset size.
- The percentage of the total migration requests this dataset size represents.
- The total wait time for these files.
- The percent of the total wait time datasets of this size represent.
- The average wait time for each individual request of this dataset size.
- The total bytes read.
- The total bytes written to ML2 storage.
- The average compression achieved.
- The total CPU time required to migrate the datasets.

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Report-09 MIGRATION AGE SUMMARY (PRIMARY - ML2)

This report presents a summary, by dataset age, of all datasets migrated from DFHSM primary storage to ML2 storage.

This report will help you pinpoint problems with your current aging strategy, if any. For example, a report may show 45 requests for datasets that have not been referenced within 50 days. It may also show 2,487 requests for a dataset age of 2. If the total bytes read for the age 50 datasets is fairly large, when compared to the total bytes read for the age 2 datasets, you may be holding such datasets on primary storage for too long a period.

If the bulk of your requests are concentrated at low aging factors, either your current DFHSM aging is very aggressive or your DASD is limited and you must continually migrate. You should also take a close look at your ARCCMDxx member or your ACS parameters and determine whether an excessive number of datasets are being excluded from the migration process. Such datasets limit the amount of primary storage under DFHSM management, and probably cause excessive migration for the remaining datasets.

HSM OPTIMIZER 6.1 MIGRATION AGE SUMMARY (PRIMARY - ML2) PAGE 7
REPORT: 09 FORMAT: 03 02/01/02 - 03/31/02 REPORT TIME: 8:36 DATE: 3/18/02

DATASET AGE	NUMBER OF REQUESTS	PERCENT OF REQUESTS	CUMULATIVE REQUESTS	CUMULATIVE PERCENT	TOTAL BYTES READ	TOTAL BYTES WRITTEN	TOTAL CPU TIME
1	918	6	918	6	44.8G	44.8G	0:09:35.59
2	462	3	1,380	10	12.4G	12.4G	0:04:09.38
3	447	3	1,827	13	15.5G	15.5G	0:07:48.29
4	451	3	2,278	16	10.6G	10.6G	0:05:01.25
5	316	2	2,594	18	5.78G	5.78G	0:03:15.63
6	2,813	20	5,407	38	12.0G	12.0G	0:34:54.97
7	1,280	9	6,687	47	5.20G	5.20G	0:12:18.53
8	794	6	7,481	53	4.64G	4.64G	0:07:04.55
9	573	4	8,054	57	2.44G	2.44G	0:05:17.48
10	617	4	8,671	61	1.97G	1.97G	0:05:21.72
15	2,395	17	11,066	78	9.02G	9.02G	0:20:26.27
20	1,274	9	12,340	87	1.61G	1.61G	0:11:15.68
25	404	3	12,744	90	455M	455M	0:03:37.99
30	274	2	13,018	92	14.6M	14.6M	0:02:09.04
40	278	2	13,296	94	2.17G	2.17G	0:02:33.53
50	243	2	13,539	96	96.9M	96.9M	0:01:54.70
60	105	1	13,644	97	349M	349M	0:00:49.40
70	95	1	13,739	97	2.89M	2.89M	0:00:46.48
80	116	1	13,855	98	3.13M	3.13M	0:00:57.36
90	68	0	13,923	99	1.22M	1.22M	0:00:35.17
100	48	0	13,971	99	1.53M	1.53M	0:00:25.04
125	43	0	14,014	99	14.5M	14.5M	0:00:22.48
150	21	0	14,035	99	54.5M	54.5M	0:00:25.68
175	12	0	14,047	99	43.3M	43.3M	0:00:24.15
200	17	0	14,064	100	771K	771K	0:00:09.68
250	8	0	14,072	100	63.6M	63.6M	0:00:32.21
300	1	0	14,073	100	309K	309K	0:00:00.37
350	12	0	14,085	100	109M	109M	0:00:32.86
1750	0	0	14,134	100	0.00K	0.00K	0:00:00.00
2000	0	0	14,134	100	0.00K	0.00K	0:00:00.00
OVER	0	0	14,134	100	0.00K	0.00K	0:00:00.00
TOTAL	14,134		14,134		130G	130G	2:26:05.91

Figure 87. REPORT-09 MIGRATION AGE SUMMARY (PRIMARY - ML2)

The Migration Age Summary Report contains the following data:

- The dataset age in days.
- The number of migration requests for the dataset age.
- The percentage of the total requests this are represents.
- Cumulative requests.
- A cumulative percentage.
- Total bytes read.
- Total bytes written.

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- Total CPU Time.

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Report-10 RECALL DETAIL (ML1 - PRIMARY)

This report is a listing of all datasets recalled from DFHSM ML1 storage to primary storage for the requested period. It presents the same information shown for migration from primary to ML1 storage.

Again, look for an excessive number of recalls for datasets that were migrated for a short period of time. Datasets that remained migrated for a relatively long period of time might be likely candidates for migration directly to ML2 storage. This will free space on ML1 storage, allowing more frequently referenced datasets to remain on ML1 storage and give better service times for dataset recall.

```
HSM OPTIMIZER  6.1                          RECALL DETAIL (ML1 - PRIMARY)                                          PAGE  33
REPORT: 10 FORMAT: 01                              02/10/02 - 02/12/02                    REPORT TIME: 12:14  DATE:  2/13/02

                                                                                  LAST   DATA
                                          FROM     TO              DATE     TIME    ACCESS   SET  READ WRITE CMP MGEMENT
DATASET NAME                             VOLUME  VOLUME  USER ID  COMPLETE COMPLETE   DATE    AGE BYTES BYTES PCT  CLASS

OSEM560.COMPAT56.BIN                     HSM000  SMS528   *H*S*M* 02/10/02  5:09:56 02/04/02    0  644K  642K   0 SMP
GSA7.LB.V0900.FIL.TESTFILE               HSM000  SMS563  AEDMF    02/12/02 13:50:28 02/12/02    0 3.91M 3.90M   0 STD10YR
GSA5.PH.P5092.FIL.FED1099.G0001V00       HSM000  SMS563  PCALX    02/12/02 15:00:46 01/31/02   12  454K 2.49M  82 STD10YR
GSA3.OP.SMFDM.BKP.SMF.G0003V00           HSM000  SMS505  GNLPROD  02/12/02 22:00:53 02/12/02    0 16.2M 16.2M   0 STD10YR
GSA5.ZZ.P0403.FIL.MTDCHG.G0631V00        HSM000  SMS566  GNLPROD  02/12/02 23:37:12 02/12/02    0 2.89M 2.89M   0 STD10YR

              TOTAL RECORDS:         5
```

Figure 88. REPORT-10 RECALL DETAIL (ML1 - PRIMARY)

The Recall Detail Report contains the following data:

- Dataset Name
- The DFHSM ML1 DASD volume the dataset was recalled from
- The primary DASD volume the dataset was recalled to
- The userid requesting the recall.
- The date the recall request was completed.
- The time the recall request was completed.
- The last access date of the dataset.
- The dataset age.
- The number of bytes read.
- The number of bytes written.
- The compression percentage.
- The DFSMS Management class of the dataset.

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Report-11 RECALL DELAY SUMMARY (ML1 - PRIMARY)

This report presents a summary by dataset size, of delays in recalling datasets. Delays usually occur when all defined DFHSM recall tasks are currently busy. Unless the average delay seems overly long, do not be too concerned with the values reported. If the average delays do seem overly long, you might want to consider allowing more concurrent DFHSM recall tasks.

HSM OPTIMIZER 6.1 RECALL DELAY SUMMARY (ML1 - PRIMARY) PAGE 8
REPORT: 11 FORMAT: 04 02/01/02 - 03/31/02 REPORT TIME: 8:36 DATE: 3/18/02

DATASET SIZE	NUMBER OF REQUESTS	PERCENT OF TOTAL REQUESTS	TOTAL WAIT TIME	PERCENT OF TOTAL WAIT TIME	AVERAGE WAIT TIME	TOTAL BYTES READ	TOTAL BYTES WRITTEN	AVERAGE PERCENT COMPRESSION	TOTAL CPU TIME
25.0K	22	12	0:12:48	20	0:00:35	44.0K	18.5K	0	0:00:16.85
50.0K	2	1	0:00:11	0	0:00:06	14.0K	92.2K	85	0:00:01.35
75.0K	4	2	0:00:40	1	0:00:10	96.0K	234K	59	0:00:02.31
100K	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
250K	2	1	0:00:09	0	0:00:05	118K	285K	59	0:00:01.19
500K	1	1	0:00:05	0	0:00:05	146K	277K	47	0:00:00.77
750K	10	5	0:01:56	3	0:00:12	4.47M	5.60M	20	0:00:05.56
1024K	9	5	0:01:13	2	0:00:08	4.99M	7.90M	37	0:00:07.22
1.50M	16	8	0:02:15	3	0:00:08	15.4M	18.4M	16	0:00:11.94
2.00M	13	7	0:02:26	4	0:00:11	15.4M	23.1M	33	0:00:09.41
3.00M	19	10	0:02:55	4	0:00:09	38.7M	48.7M	21	0:00:14.82
4.00M	9	5	0:01:49	3	0:00:12	25.1M	31.8M	21	0:00:06.49
5.00M	8	4	0:01:24	2	0:00:10	32.6M	36.3M	10	0:00:06.53
7.50M	12	6	0:07:05	11	0:00:35	64.6M	75.0M	14	0:00:09.84
10.0M	13	7	0:16:57	26	0:01:18	107M	112M	4	0:00:10.90
20.0M	45	24	0:12:00	18	0:00:16	644M	685M	6	0:00:37.38
30.0M	6	3	0:01:43	3	0:00:17	128M	128M	0	0:00:05.27
40.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
50.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
75.0M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
100M	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
OVER	0	0	0:00:00	0	0:00:00	0.00K	0.00K	0	0:00:00.00
TOTAL	191		1:05:36			1.06G	1.15G		0:02:27.83

Figure 89. REPORT-11 RECALL DELAY SUMMARY (ML1 - PRIMARY)

The recall Delay Summary Report contains the following data:

- Dataset size.
- The number of recall requests for the dataset size.
- The percentage of the total recall requests this dataset size represents.
- The total wait time for this size datasets.
- The percent of total wait time for these datasets.
- The average unit time for each individual request of this dataset size.
- The total bytes read.
- The total bytes written to ML1 storage.
- The average compression achieved.
- The total CPU time to recall these datasets.

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Report-12 RECALL AGE SUMMARY (ML1 - PRIMARY)

This report presents a summary, by dataset age, of all datasets recalled from DFHSM ML1 storage to primary storage.

HSM OPTIMIZER 6.1 RECALL AGE SUMMARY (ML1 - PRIMARY) PAGE 9
REPORT: 12 FORMAT: 03 02/01/02 - 03/31/02 REPORT TIME: 8:36 DATE: 3/18/02

DATASET AGE	NUMBER OF REQUESTS	PERCENT OF REQUESTS	CUMULATIVE REQUESTS	CUMULATIVE PERCENT	TOTAL BYTES READ	TOTAL BYTES WRITTEN	TOTAL CPU TIME
1	157	82	157	82	964M	1.01G	0:02:01.33
2	12	6	169	88	52.0M	52.9M	0:00:09.77
3	7	4	176	92	11.9M	12.6M	0:00:05.35
4	3	2	179	94	19.2M	28.7M	0:00:02.47
5	0	0	179	94	0.00K	0.00K	0:00:00.00
6	3	2	182	95	4.35M	4.38M	0:00:02.05
7	5	3	187	98	3.14M	4.83M	0:00:03.69
8	1	1	188	98	22.7M	22.7M	0:00:00.78
9	1	1	189	99	1.07M	1.07M	0:00:00.81
10	0	0	189	99	0.00K	0.00K	0:00:00.00
15	2	1	191	100	3.88M	9.00M	0:00:01.58
20	0	0	191	100	0.00K	0.00K	0:00:00.00
25	0	0	191	100	0.00K	0.00K	0:00:00.00
30	0	0	191	100	0.00K	0.00K	0:00:00.00
40	0	0	191	100	0.00K	0.00K	0:00:00.00
50	0	0	191	100	0.00K	0.00K	0:00:00.00
60	0	0	191	100	0.00K	0.00K	0:00:00.00
70	0	0	191	100	0.00K	0.00K	0:00:00.00
80	0	0	191	100	0.00K	0.00K	0:00:00.00
90	0	0	191	100	0.00K	0.00K	0:00:00.00
100	0	0	191	100	0.00K	0.00K	0:00:00.00
125	0	0	191	100	0.00K	0.00K	0:00:00.00
150	0	0	191	100	0.00K	0.00K	0:00:00.00
175	0	0	191	100	0.00K	0.00K	0:00:00.00
200	0	0	191	100	0.00K	0.00K	0:00:00.00
250	0	0	191	100	0.00K	0.00K	0:00:00.00
300	0	0	191	100	0.00K	0.00K	0:00:00.00
350	0	0	191	100	0.00K	0.00K	0:00:00.00
400	0	0	191	100	0.00K	0.00K	0:00:00.00
450	0	0	191	100	0.00K	0.00K	0:00:00.00
500	0	0	191	100	0.00K	0.00K	0:00:00.00
600	0	0	191	100	0.00K	0.00K	0:00:00.00
700	0	0	191	100	0.00K	0.00K	0:00:00.00
800	0	0	191	100	0.00K	0.00K	0:00:00.00
900	0	0	191	100	0.00K	0.00K	0:00:00.00
1000	0	0	191	100	0.00K	0.00K	0:00:00.00
1250	0	0	191	100	0.00K	0.00K	0:00:00.00
1500	0	0	191	100	0.00K	0.00K	0:00:00.00
1750	0	0	191	100	0.00K	0.00K	0:00:00.00
2000	0	0	191	100	0.00K	0.00K	0:00:00.00
OVER	0	0	191	100	0.00K	0.00K	0:00:00.00
TOTAL	191		191		1.06G	1.15G	0:02:27.83

Figure 90. REPORT-12 RECALL AGE SUMMARY (ML1 - PRIMARY)

The following data is presented:

- The dataset age in days.
- The number of recall requests for the dataset age.
- The percentage of the total requests this age represents.
- Cumulative requests.
- A cumulative percentage.
- Total bytes read.
- Total bytes written.
- Total CPU time needed to recall these datasets.

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Report-13 RECALL DETAIL (ML2 - PRIMARY)

This report is a listing of all datasets recalled from DFHSM ML2 storage to primary storage for the requested period.

Again, look for an excessive number of recalls for datasets that were migrated for a short period of time. Datasets that remained migrated for a relatively long period of time might be likely candidates for migration directly to ML2 storage. This will free space on ML1 storage, allowing more frequently referenced datasets to remain on ML1 storage and give better service times for dataset recall.

```
HSM OPTIMIZER  6.1                        RECALL DETAIL (ML2 - PRIMARY)                                  PAGE  37
REPORT: 13 FORMAT: 01                            02/10/02 - 02/12/02                  REPORT TIME: 12:14  DATE:  2/13/02

                                                                                    LAST   DATA
                                  FROM     TO                      DATE     TIME    ACCESS   SET  READ WRITE CMP MGEMENT
DATASET NAME                      VOLUME   VOLUME  USER ID  COMPLETE COMPLETE   DATE     AGE BYTES BYTES PCT  CLASS

GSA5.SP.P5035.BKP.SP1PPTR.G0150V00 026044  SMS572  AEKEW    02/11/02 17:45:17 01/17/02   11 0.00K 31.9M   0 STD10YR
GSA1.Z0.I6102.FIL.TIMEDATA.G0153V00 031494 SMS558  GNLPROD  02/11/02 23:25:40 02/04/02    1 0.00K  275K   0 STD10YR
GSA1.Z0.I0403.FIL.MTDCHG.G1676V00 022454  SMS501  GNLPROD  02/12/02  0:22:18 02/09/02    1 0.00K 11.9M   0 STD10YR
GSA4.LB.B0307.FIL.MTDCHG.G0028V00 025498  SMS501  GNLPROD  02/12/02  0:43:12 02/09/02    1 0.00K  519K   0 STD10YR
GSA5.CT.P5090.BKP.CT1PPTR         024649  SMS504  AEKEW    02/12/02  9:44:25 01/19/99 1105 0.00K 1.44M   0 STD10YR
GSA5.AI.P5090.BKP.AI1PPTR         029451  SMS504  AEKEW    02/12/02  9:45:41 02/11/02    0 0.00K  119M   0 STD10YR
GSA5.IC.P5090.BKP.IC1PPTR         023239  SMS563  AEKEW    02/12/02  9:46:44 01/26/99 1095 0.00K  329K   0 STD10YR
GSA2.ZZ.M0406.FIL.UBCRECON.G1450V00 025498 SMS563  SPJRM    02/12/02  9:47:21 02/06/02    0 0.00K 40.1K   0 STD10YR
GSA5.KC.P5090.BKP.KC1PPTR         028837  SMS563  AEKEW    02/12/02  9:48:22 12/30/99  644 0.00K 0.82K   0 STD10YR
GSA5.OI.P5090.BKP.OI1PPTR         023114  SMS563  AEKEW    02/12/02  9:49:28 01/27/99 1104 0.00K 3.69M   0 STD10YR
GSA5.PU.P5090.BKP.PU1PPTR         028008  SMS504  AEKEW    02/12/02 10:00:30 12/30/99  676 0.00K 0.82K   0 STD10YR
GSA5.XL.P5090.BKP.XL1PPTR         028837  SMS563  AEKEW    02/12/02 10:13:11 12/30/99  644 0.00K 0.82K   0 STD10YR
GSA4.AI.B0941.FIL.ENRLBEN         023313  SMS504  AEJHT    02/12/02 10:16:19 02/08/02    0 0.00K 2.73M   0 STD10YR
GSA5.FN.L2001.FIL.FED1099.G0017V00 019068  SMS563  SPJRM    02/12/02 11:08:34 01/24/02   12 0.00K 55.5K   0 STD10YR
GSAE.LB.F0000.DBS.LB2FNTR         031567  SMS563  AESVB    02/12/02 12:05:38 01/30/02    0 0.00K  627K   0 TEST
GSAE.LB.F0000.DBS.LB2FATR         031607  SMS563  TESTUSR  02/12/02 12:07:02 01/30/02    4 0.00K 1.71K   0 TEST
GSAE.LB.F0000.DBS.LB2FGTR         012567  SMS504  AESVB    02/12/02 12:07:40 01/30/02    7 0.00K  783K   0 TEST
GSA4.AI.B0902.FIL.AI0BHST.G0049V00 026744* SMS512  AEOLP    02/12/02 12:27:27 01/01/02   41 0.00K  214M   0 STD10YR
ATP3.LB.D0400.FIL.TOOTH           031464  SMS504  APJBW    02/12/02 12:28:44 02/06/02    3 0.00K  119M   0 STDMTLY
GSA4.AI.B0902.FIL.AI0BHST.G0050V00 023170* SMS510  AEOLP    02/12/02 12:29:56 01/31/02    6 0.00K  217M   0 STD10YR
GSA4.AI.B080B.FIL.GENACTG.G0056V00 022057  SMS563  AEOLP    02/12/02 12:41:49 01/31/02    1 0.00K 7.06M   0 STD10YR
GSA5.TC.P0301.FIL.TCALPHA         025821  SMS563  AEKEW    02/12/02 12:53:19 01/23/02   10 0.00K  165K   0 STD10YR
GSA4.AI.B0943.FIL.AI0BTRN         019255  SMS503  AEJHT    02/12/02 14:19:09 11/09/01   92 0.00K  119M   0 STD10YR
GSA7.PP.K1790.FIL.UPKMSTR         026482  SMS563  AECBS    02/12/02 15:09:01 02/09/02    2 0.00K 95.1M   0 STD10YR
GSA4.PP.B1006.FIL.PP0BELG.G0041V00 031566 SMS502  AEJHT    02/12/02 16:15:05 02/08/02    0 0.00K 9.09M   0 STD10YR
GSA5.BK.P5035.BKP.BK1PPTR.G0114V00 019508 SMS566  AEKEW    02/12/02 16:34:06 02/11/02    0 0.00K 8.45M   0 STD10YR
GSA5.CY.P5035.BKP.CY1PPTR.G0132V00 019242 SMS503  AEKEW    02/12/02 16:43:05 01/23/02   18 0.00K 16.7M   0 STD10YR
GSA5.IC.P5035.BKP.IC1PPTR.G0163V00 025512 SMS505  AEKEW    02/12/02 17:20:20 01/10/02   12 0.00K 1.44M   0 STD10YR
ATP3.LB.BABPA.FIL.ER.HISTORY.G06  030824  SMS505  AEOLP    02/12/02 21:27:04 01/29/02   13 0.00K 7.14M   0 STDMTLY

                                  *  DATASET EXISTS ON MULTIPLE TAPE VOLUMES
```

Figure 91. REPORT-13 RECALL DETAIL (ML2 - PRIMARY)

The Recall Detail Report contains the following data:

- Dataset Name
- The DFHSM ML2 tape volume the dataset was recalled from.
- The primary DASD volume the dataset was recalled to.
- The userid requesting the recall.
- The date the recall request was completed.
- The time the recall request was completed.
- The last access date of the dataset.
- The dataset age.
- The number of bytes read.
- The number of bytes written.
- The compression percentage.
- The DFSMS Management class of the dataset.

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Report-14 RECALL DELAY SUMMARY (ML2 - PRIMARY)

This report presents a summary by dataset size, of delays in recalling datasets. Delays usually occur when waiting for a tape mount to occur.

HSM OPTIMIZER 6.1 — RECALL DELAY SUMMARY (ML2 - PRIMARY) — PAGE 10
REPORT: 14 FORMAT: 04 — 02/01/02 - 03/31/02 — REPORT TIME: 8:36 DATE: 3/18/02

DATASET SIZE	NUMBER OF REQUESTS	PERCENT OF TOTAL REQUESTS	TOTAL WAIT TIME	PERCENT OF TOTAL WAIT TIME	AVERAGE WAIT TIME	TOTAL BYTES READ	TOTAL BYTES WRITTEN	AVERAGE PERCENT COMPRESSION	TOTAL CPU TIME
25.0K	91	6	6:14:14	7	0:04:07	0.00K	311K	0	0:01:08.72
50.0K	106	7	5:20:25	6	0:03:01	0.00K	3.90M	0	0:01:19.42
75.0K	81	5	3:18:48	4	0:02:27	0.00K	4.46M	0	0:01:04.40
100K	21	1	1:00:19	1	0:02:52	0.00K	1.83M	0	0:00:16.02
250K	180	12	8:39:25	9	0:02:53	0.00K	26.5M	0	0:02:22.77
500K	160	10	6:58:30	7	0:02:37	0.00K	57.4M	0	0:02:03.15
750K	88	6	4:19:59	5	0:02:57	0.00K	53.9M	0	0:01:10.22
1024K	74	5	3:56:51	4	0:03:12	0.00K	63.7M	0	0:01:02.90
1.50M	128	8	5:59:10	6	0:02:48	0.00K	156M	0	0:01:45.80
2.00M	56	4	3:34:14	4	0:03:50	0.00K	97.9M	0	0:00:46.84
3.00M	62	4	2:43:34	3	0:02:38	0.00K	154M	0	0:00:54.48
4.00M	49	3	2:42:34	3	0:03:19	0.00K	168M	0	0:00:46.59
5.00M	52	3	3:07:03	3	0:03:36	0.00K	229M	0	0:00:55.23
7.50M	54	4	3:06:45	3	0:03:28	0.00K	339M	0	0:00:50.56
10.0M	40	3	2:24:60	3	0:03:37	0.00K	344M	0	0:00:38.62
20.0M	111	7	10:48:09	12	0:05:50	0.00K	1.58G	0	0:02:24.46
30.0M	33	2	2:04:19	2	0:03:46	0.00K	753M	0	0:00:40.55
40.0M	15	1	1:05:19	1	0:04:21	0.00K	496M	0	0:00:19.71
50.0M	15	1	0:42:46	1	0:02:51	0.00K	669M	0	0:00:39.62
75.0M	27	2	1:56:44	2	0:04:19	0.00K	1.72G	0	0:01:19.72
100M	25	2	2:27:28	3	0:05:54	0.00K	2.14G	0	0:04:05.84
OVER	70	5	10:35:41	11	0:09:05	0.00K	15.2G	0	0:07:52.83
TOTAL	1,538		93:07:17			0.00K	24.2G		0:34:28.45

Figure 92. REPORT-14 RECALL DELAY SUMMARY (ML2 - PRIMARY)

The Recall Delay Summary Report contains the following data:

- Dataset size.
- The number of recall requests for the dataset size.
- The percentage of the total recall requests this dataset size represents.
- The total wait time for this size datasets.
- The percent of total wait time for these datasets.
- The average unit time for each individual request of this dataset size.
- The total bytes read.
- The total bytes written to ML1 storage.
- The average compression achieved.
- The total CPU time to recall these datasets.

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Report-15 RECALL AGE SUMMARY (ML2 - PRIMARY)

This report presents a summary, by dataset age, of all datasets recalled from DFHSM ML2 storage to primary storage.

HSM OPTIMIZER 6.1 — RECALL AGE SUMMARY (ML2 - PRIMARY) — PAGE 11
REPORT: 15 FORMAT: 03 — 02/01/02 - 03/31/02 — REPORT TIME: 8:36 DATE: 3/18/02

DATASET AGE	NUMBER OF REQUESTS	PERCENT OF REQUESTS	CUMULATIVE REQUESTS	CUMULATIVE PERCENT	TOTAL BYTES READ	TOTAL BYTES WRITTEN	TOTAL CPU TIME
1	206	13	206	13	0.00K	6.22G	0:07:55.16
2	75	5	281	18	0.00K	1.94G	0:01:53.30
3	65	4	346	22	0.00K	1.13G	0:00:55.52
4	65	4	411	27	0.00K	566M	0:01:23.31
5	55	4	466	30	0.00K	1.26G	0:01:45.98
6	50	3	516	34	0.00K	670M	0:00:41.75
7	48	3	564	37	0.00K	583M	0:01:15.96
8	33	2	597	39	0.00K	574M	0:00:27.31
9	39	3	636	41	0.00K	1.03G	0:00:31.90
10	38	2	674	44	0.00K	317M	0:00:31.35
15	206	13	880	57	0.00K	2.99G	0:05:01.35
20	155	10	1,035	67	0.00K	1.50G	0:03:36.50
25	118	8	1,153	75	0.00K	1.14G	0:01:34.06
30	75	5	1,228	80	0.00K	710M	0:01:03.19
40	63	4	1,291	84	0.00K	149M	0:01:02.31
50	44	3	1,335	87	0.00K	2.81G	0:00:41.23
60	18	1	1,353	88	0.00K	105M	0:00:21.08
70	15	1	1,368	89	0.00K	61.3M	0:00:18.11
80	5	0	1,373	89	0.00K	76.3M	0:00:09.44
90	7	0	1,380	90	0.00K	87.6M	0:00:09.28
100	9	1	1,389	90	0.00K	189M	0:00:07.36
125	16	1	1,405	91	0.00K	47.7M	0:00:19.77
150	10	1	1,415	92	0.00K	95.2M	0:00:21.50
175	16	1	1,431	93	0.00K	261M	0:00:18.08
200	12	1	1,443	94	0.00K	92.1M	0:00:13.42
250	10	1	1,453	94	0.00K	288M	0:00:09.25
300	15	1	1,468	95	0.00K	111M	0:00:12.75
350	7	0	1,475	96	0.00K	38.6M	0:00:05.84
400	13	1	1,488	97	0.00K	69.3M	0:00:10.45
450	6	0	1,494	97	0.00K	10.9M	0:00:06.49
500	3	0	1,497	97	0.00K	8.54M	0:00:04.75
600	3	0	1,500	98	0.00K	2.57M	0:00:03.84
700	11	1	1,511	98	0.00K	16.3M	0:00:12.60
800	12	1	1,523	99	0.00K	4.26M	0:00:11.62
900	1	0	1,524	99	0.00K	2.29M	0:00:02.52
1000	3	0	1,527	99	0.00K	7.37M	0:00:02.29
1250	5	0	1,532	100	0.00K	6.25M	0:00:03.75
1500	0	0	1,532	100	0.00K	0.00K	0:00:00.00
1750	2	0	1,534	100	0.00K	5.69M	0:00:01.49
2000	0	0	1,534	100	0.00K	0.00K	0:00:00.00
OVER	4	0	1,538	100	0.00K	98.1M	0:00:22.59
TOTAL	1,538		1,538		0.00K	25.1G	0:34:28.45

Figure 93. REPORT-15 RECALL AGE SUMMARY (ML2 - PRIMARY)

The following data is presented:

- The dataset age in days.
- The number of recall requests for the dataset age.
- The percentage of the total requests this age represents.
- Cumulative requests.
- A cumulative percentage.
- Total bytes read.
- Total bytes written.
- Total CPU time needed to recall these datasets.

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Report-16 DFHSM DASD VOLUME SUMMARY

The DFHSM Volume Report shows the activity of all the volumes under DFHSM control.

HSM OPTIMIZER 6.1 — DFHSM DASD VOLUME SUMMARY — PAGE 2
REPORT: 16 FORMAT: 08 — 02/01/02 - 03/31/02 — REPORT TIME: 16:08 DATE: 3/18/02

		- PERCENT - USED			FRAGMENT INDEX			-- MIGRATION -		--- RECALL ---		--- BACKUP ---		--- RECOVER --		-------- VOLUME DUMP ---------			
VOLSER	TYPE	AVG	MIN	MAX	AVG	MIN	MAX	DATASET COUNT	ELPSD TIME	DATASET COUNT	ELPSD TIME	DATASET COUNT	ELPSD TIME	DATASET COUNT	ELPSD TIME	DUMP COUNT	ELPSD TIME	LAST DUMP DATE	LAST DUMP TIME
HSM000	M	40	4	91	166	39	392	2,179	8:07	183	0:50	864	5:02	0	0:00				
MVSRSF	P	99	99	99	207	207	207	0	0:00	0	0:00	541	3:17	0	0:00	3	1:41	03/10/02	10:58:43
MVSRS0	P	97	97	97	9	9	9	0	0:00	0	0:00	544	3:24	0	0:00	5	2:55	03/10/02	10:13:22
MVSRS2	P	96	96	96	26	26	26	0	0:00	0	0:00	0	0:00	0	0:00				
MVSRS3	P	99	99	99	6	6	6	0	0:00	0	0:00	544	2:59	0	0:00	5	2:49	03/10/02	10:46:08
MVSRS5	P	99	99	99	16	16	16	0	0:00	0	0:00	544	2:43	0	0:00	2	1:07	03/10/02	10:25:58
MVSRS6	P	97	96	99	122	16	168	0	0:00	0	0:00	547	2:42	0	0:00	4	2:08	03/10/02	11:16:48
PAGE00	P	0	0	0	0	0	0	0	0:00	0	0:00	0	0:00	0	0:00	1	0:24	03/03/02	11:03:06
PAGE03	P	79	79	79	0	0	0	0	0:00	0	0:00	10	0:50	0	0:00	2	0:34	03/10/02	11:16:10
SMS402	P	91	91	91	534	533	535	0	0:00	0	0:00	270	2:45	0	0:00	3	1:43	03/10/02	9:33:13
SMS403	P	1	1	1	114	114	114	0	0:00	0	0:00	0	0:00	0	0:00				
SMS501	P	69	44	85	275	135	458	1,262	9:10	188	1:15	1,811	28:51	3	0:03				
SMS502	P	69	49	86	378	234	564	1,235	9:37	151	1:15	3,749	47:27	0	0:00				
SMS503	P	70	58	84	352	144	518	1,266	9:18	135	0:38	3,478	35:08	4	0:11				
SMS504	P	69	52	85	290	118	463	1,156	7:50	234	1:18	3,178	27:44	2	0:04				
SMS505	P	70	55	90	324	143	541	1,492	8:54	255	0:57	3,443	34:52	1	0:02				
SMS506	P	75	60	85	272	164	390	956	5:26	60	0:16	2,240	27:32	0	0:00				
SMS507	P	72	61	81	349	187	509	1,008	6:19	46	0:28	2,474	25:06	0	0:00				
SMS508	P	74	53	87	247	131	431	1,069	6:58	79	0:15	1,875	30:10	0	0:00				
SMS510	P	62	24	98	91	43	297	8	0:49	4	0:26	68	6:16	0	0:00				
SMS511	P	60	47	97	130	103	285	5	0:19	0	0:00	75	9:27	0	0:00				
SMS513	P	56	3	96	103	0	203	8	1:03	6	1:08	22	2:29	0	0:00				
SMS517	P	63	57	96	99	77	146	1	0:02	0	0:00	70	11:02	0	0:00				
SMS518	P	72	55	89	576	487	713	963	6:29	107	0:31	2,288	29:08	0	0:00				
SMS520	P	78	74	80	326	274	347	5	0:02	1	0:00	130	3:01	0	0:00				
SMS521	P	80	77	82	343	333	366	18	0:02	0	0:00	119	2:59	0	0:00				
SMS522	P	78	76	83	238	232	251	7	0:04	0	0:00	245	2:40	0	0:00				
SMS524	P	78	75	79	272	266	281	1	0:01	0	0:00	102	1:22	0	0:00				
SMS525	P	80	79	80	340	325	360	10	0:04	0	0:00	146	2:33	1	0:05				
SMS527	P	56	50	61	137	120	163	4	0:04	1	0:01	229	3:14	0	0:00				
SMS532	P	95	95	95	212	211	214	0	0:00	0	0:00	136	1:22	0	0:00	4	2:43	03/10/02	9:52:03
SMS558	P	71	56	84	551	431	657	767	5:47	196	0:47	2,354	20:52	1	0:04				

Figure 94. REPORT-16 DFHSM DASD VOLUME SUMMARY

The report contains the following data:

- The DASD volume serial number.
- The type of volume: P represents a primary volume; M represents a migration volume (it might be a Level-2 volume if you do not use tape for ML2 volumes).
- The next three columns present information concerning the percentage of use during the reporting period. Average, minimum and maximum values are reported. These values can assist you in determining what threshold values should be used for the volume.
- The next three columns report fragmentation index values. These values will assist you in determining the appropriate fragmentation index factors to apply to the Optimizer's defragmentation levels.
- The next two columns present migration statistics: the number of datasets migrated from the volume during the reporting period, and the elapsed time to do the migrations.
- Recall statistics are presented in the next two columns: the number of datasets recalled to the volume, and the elapsed time for the recalls.
- Backup statistics are presented next: the number of backups that occurred on the volume for the reporting period, and the elapsed time for the backups.
- Recover statistics are presented: the number of datasets recovered, and the elapsed time for the recoveries.
- The final four columns contain entries if you are using the volume dump feature of DFHSM for the volume. The entries are: the number of times the volume was dumped during the reporting period; the elapsed time for the dump operations; and the date and time of the last dump operation.

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Report-17 PRIMARY DATASET ACTIVITY REPORT

The Primary Dataset Activity Report list the datasets that are thrashing. By specifying a Data Set movement index, only datasets that exceed that value will be included on the report. The index is calculated as:

```
DMIndex = total migrations + total recalls / 30
```

Note: Total Migrations and Total Recalls are calculated from thirty days preceding the Report Ending Date.

The minimum retention date for the HSM Optimizer Report Database should be two months, but the recommended retention date is three months, so that the dataset movement index will include enough data to be of value. The report is sorted in descending order by dataset movement index.

HSM OPTIMIZER 6.1 — PRIMARY DATASET ACTIVITY REPORT — PAGE 43
REPORT: 17 FORMAT: 06 — 02/10/02 - 02/12/02 — REPORT TIME: 12:14 DATE: 2/13/02

DATASET NAME	SIZE	MOVEMENTS PER DAY	- MIGRATION -- PAST 7 DAYS	PAST 30 DAYS	PREV 30 DAYS	--- RECALL --- PAST 7 DAYS	PAST 30 DAYS	PREV 30 DAYS	--- BACKUP --- PAST 7 DAYS	PAST 30 DAYS	PREV 30 DAYS	-- RECOVERY -- PAST 7 DAYS	PAST 30 DAYS	PREV 30 DAYS
ATP3.LB.BABPA.FIL.ELIG.MASTER.L17	110M	0.700	0	12	4	0	10	4	0	0	1	0	0	0
CICSEM.SPDAW.SOURCE	532K	0.533	0	8	0	0	8	0	1	5	0	0	0	0
ATP3.LB.D0400.FIL.TOOTH	119M	0.433	4	7	0	3	6	0	0	1	0	0	0	0
ATP3.LB.BABPA.FIL.CLM1	94.2M	0.433	1	7	2	1	6	2	0	0	1	0	0	0
ATP3.LB.BABPA.FIL.CLM2	100M	0.400	0	6	1	0	6	0	0	0	1	0	0	0
ATP3.LB.BABPA.FIL.ACUM.XTRACT.L19	207M	0.400	0	6	4	0	6	2	0	0	1	0	0	0
ATP3.LB.BABPA.FIL.CLM4	101M	0.400	1	6	1	1	6	0	0	0	1	0	0	0
ATP3.LB.BABPA.FIL.PELIG1.SEQ.L20	289M	0.367	1	5	3	2	6	2	1	3	1	0	0	0
GSA2.ZZ.M5002.BIL.BILLS01	255M	0.333	0	5	9	0	5	7	1	3	1	0	1	1
GSA3.OP.SMFDM.BKP.SMF.G0001V00	21.4M	0.333	0	5	2	0	5	2	0	0	0	0	0	0
ATP3.LB.BABPA.FIL.ER.HISTORY.L18	399M	0.300	1	5	3	1	4	3	0	2	1	0	0	0
GSA4.LB.V9999.FIL.LB0BVAC	76.5M	0.267	0	4	2	0	4	0	0	3	8	0	0	0
GSA4.LB.B9310.FIL.LB0BHST	392M	0.267	0	5	4	0	4	0	1	5	4	0	0	0
GSA4.CY.B4113.FIL.ADJBILL	2.19M	0.233	0	4	0	0	3	0	0	1	1	0	0	0
GSA3.OP.SMFDM.BKP.SMF.G0002V00	22.6M	0.233	0	3	2	0	4	2	0	0	0	0	0	0
GSA2.ZZ.M5024.FIL.BILLS.G0036V00	836K	0.200	0	3	0	1	3	0	0	0	1	0	0	0
GSA4.LB.V9150.FIL.LB0BCHK	1.77M	0.200	1	3	0	1	3	0	0	5	2	0	0	0
GSA2.FH.R0102.FIL.FEE	130M	0.200	0	3	0	1	3	0	1	1	2	0	0	0
ATP3.LB.BABPA.FIL.VAC.CHECK.HISTY.L02	7.56M	0.200	0	4	0	0	3	0	0	0	1	0	0	0
ATP3.LB.BABPA.FIL.MEMB.MSTR.L15	22.7M	0.167	1	2	1	1	3	1	0	0	1	0	0	0
GSA5.LB.A2092.FIL.LB1APEN	102M	0.167	2	4	4	2	2	0	1	3	8	0	0	0
GSA4.LB.B9215.FIL.ACTGERN	14.7M	0.167	0	4	0	0	2	0	0	3	0	0	0	0
GSA2.ZZ.R0996.FIL.IC9PROC	1.14M	0.167	0	1	0	1	4	0	0	0	1	0	0	0
GSA2.ZZ.M5024.FIL.BILLS.G0033V00	928K	0.167	0	2	0	1	3	0	0	1	0	0	0	0
GSA2.ZZ.M5024.FIL.BILLS.G0034V00	836K	0.167	0	2	0	1	3	0	0	1	0	0	0	0
GSA2.ZZ.M5024.FIL.BILLS.G0035V00	836K	0.167	0	2	0	1	3	0	0	1	0	0	0	0
GSA4.AI.B080B.FIL.GENACTG.G0056V00	7.06M	0.133	1	2	0	1	2	0	0	1	0	0	0	0
GSA4.LB.B9107.FIL.XREFIL1	2.90M	0.133	1	2	0	2	2	0	1	1	0	0	0	0
GSA5.AN.P2001.FIL.FED1099.G0016V00	3.42M	0.133	0	1	0	1	3	0	0	1	0	0	0	0
GSA7.FN.K1010.BKP.FNEEMSTB.G0023V00	4.92M	0.133	0	2	0	0	2	0	0	1	0	0	0	0
GSA5.ZZ.P0403.FIL.MTDCHG.G0607V00	3.90M	0.133	0	2	0	0	2	0	0	1	0	0	0	0

Figure 95. REPORT-17 PRIMARY DATASET ACTIVITY REPORT

The following data is presented:

- Dataset Name
- Size
- Movements Per Day
- Migration
  - Past 7 Days
  - Past 30 Days
  - Previous 30 Days
- Recall
  - Past 7 Days

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    - Past 30 Days
    - Previous 30 Days
- Backup
    - Past 7 Days
    - Past 30 Days
    - Previous 30 Days
- Recovery
    - Past 7 Days
    - Past 30 Days
    - Previous 30 Days.

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Report-18 DFHSM ERROR DETAIL REPORT

The DFHSM Error Detail Report lists all the datasets during the reporting period that failed DFHSM processing for one reason or another. The datasets are listed by DFHSM error and reason code.

The type of errors which require investigation include unsupported dataset errors: the dataset may have been created and never opened leaving an unknown DSORG, catalog locate errors (probably a dataset that has been uncataloged but not deleted), or any other error which you do not believe should occur. It is probably worth your time to investigate any such error the first time you produce these reports.

```
HSM OPTIMIZER  6.1                                DFHSM ERROR DETAIL REPORT                                                  PAGE  58
REPORT: 18 FORMAT: 05                                  02/10/02 - 02/12/02                    REPORT TIME: 12:14  DATE:  2/13/02

                    FUNCTION: DAILY BACKUP                     RETURN CODE: 19          REASON CODE:  00

                                ARC1319I DATASET IN USE BY ANOTHER USER OR JOB, BACKUP REJECTED

                                                                FROM        TO
              DATASET NAME                                     VOLUME     VOLUME      USER ID       DATE       TIME

              GSA1.OP.ZDISP.FIL.DISPAUDT.G0708V00              SMS505                **HSM***     02/12/02    2:15:49
              GSA5.XI.P5035.FIL.XIICHKF                        SMS505                **HSM***     02/12/02    2:08:06
              GSA9.ZZ.CICSX.FIL.DFHDMPA                        SMS503                **HSM***     02/12/02    2:15:03
              SPLFY.TRACE                                      SMS513                **HSM***     02/12/02    1:25:59
              SYSX.VCSS.PROD.CKPT                              SYS001                **HSM***     02/10/02   21:30:10
              SYSX.VCSS.TEST.CKPT                              SYS002                **HSM***     02/10/02   21:30:15

                TOTAL ERRORS:         6

              TOTAL DATASETS:         6
```

Figure 96. REPORT-18 DFHSM ERROR DETAIL REPORT

The report contains the following information:

- Heading Information
  - DFHSM Function
  - Function Return Code
  - Function Reason Code
  - DFHSM Error Message
- Dataset Name
- From Volume
- To volume
- User ID
- Date
- Time

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Report-19 DFHSM ERROR SUMMARY REPORT

The DFHSM Error Summary Report lists the total number of errors and the number of datasets that DFHSM could not process for one reason or another. The report is summarized by DFHSM error and reason code.

The types of errors which require investigation include unsupported dataset errors: the dataset may have been created and never opened leaving an unknown DSORG, catalog locate errors (probably a dataset that has been uncataloged but not deleted), or any other error which you do not believe should occur. It is probably worth your time to investigate any such error the first time you produce these reports.

```
HSM OPTIMIZER  6.1                          DFHSM ERROR SUMMARY REPORT                                        PAGE  73
REPORT: 19 FORMAT: 07                            02/10/02 - 02/12/02                  REPORT TIME: 12:14  DATE:  2/13/02

                            RETURN  REASON  ERROR  DATASET
FUNCTION                     CODE    CODE   COUNT   COUNT   MESSAGE

MIGRATE FROM PRIMARY TO ML1    19      01      15       1   ARC1219I DATASET IN USE BY ANOTHER USER OR JOB, MIGRATION REJECTED
    TOTAL                                      15       1

MIGRATE FROM PRIMARY TO ML2    06      00      35       3   ARC1206I DUPLICATE DATA SET NAME IN DFHSM DATA BASE
                               19      05      11       8   ARC1219I DATASET IN USE BY ANOTHER USER OR JOB, MIGRATION REJECTED
                               19      08       1       1   ARC1219I DATASET IN USE BY ANOTHER USER OR JOB, MIGRATION REJECTED
                               58      08      46       5   ARC1258I MIGRATION FAILED FOR DATA SET
                               68     910       1       1   NO MESSAGE FOR THIS CONDITION
    TOTAL                                      94      18

RECALL FROM ML2 TO PRIMARY     02      00       3       2   ARC1102I DATA SET IS NOT MIGRATED/BACKED UP
    TOTAL                                       3       2

DELETE MIGRATED DATASET        02      00      12       3   ARC1202I CATALOG LOCATE ERROR DURING MIGRATION
    TOTAL                                      12       3

DAILY BACKUP                   17      00       1       1   ARC1317I I/O ERROR READING PDS DIRECTORY DURING BACKUP
                               19      00       6       6   ARC1319I DATASET IN USE BY ANOTHER USER OR JOB, BACKUP REJECTED
                               19      12       2       2   ARC1319I DATASET IN USE BY ANOTHER USER OR JOB, BACKUP REJECTED
                               68     799       1       1   NO MESSAGE FOR THIS CONDITION
                               68     910       2       2   NO MESSAGE FOR THIS CONDITION
                               70      13      22      22   ARC1370I AN ERROR OCCURRED WHILE DFHSM WAS PROCESSING AN SMS MANAGED
                                                               DATA SET
                               00      00       1       1   NO MESSAGE FOR THIS CONDITION
    TOTAL                                      35      35

RECYCLE BACKUP VOLUME          16      00       1       1   NO MESSAGE FOR THIS CONDITION
                               31      00       1       1   NO MESSAGE FOR THIS CONDITION
                               69      00       2       2   NO MESSAGE FOR THIS CONDITION
                               00      00       2       2   NO MESSAGE FOR THIS CONDITION
    TOTAL                                       6       6

RECYCLE MIGRATION VOLUME       31      00       2       2   NO MESSAGE FOR THIS CONDITION
                               69      00       1       1   NO MESSAGE FOR THIS CONDITION
                               00      00       2       2   NO MESSAGE FOR THIS CONDITION
    TOTAL                                       5       5

VOLUME DUMP                    08      00       1       1   NO MESSAGE FOR THIS CONDITION
                               16      00       2       1   NO MESSAGE FOR THIS CONDITION
    TOTAL                                       3       2
```

Figure 97. REPORT-19 DFHSM ERROR SUMMARY REPORT

The report contains the following information:

- The DFHSM Function being performed.
- The Return Code
- The Reason Code
- An Error Count
- Number of Datasets having the error
- The DFHSM Error Message

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Report-20 ACTIVITY SUMMARY

The Activity Summary report shows the summary activity for DFHSM processing for the last 24 hours **and** for the report period selected by the Beginning Date for Reports and the Ending Date for Reports.

HSM OPTIMIZER 6.1 — ACTIVITY SUMMARY — PAGE 2
REPORT: 20 FORMAT: 09 — 02/01/02 - 03/31/02 — REPORT TIME: 16:10 DATE: 3/18/02

	LAST 24 DATA HOURS 03/15/02 19:29 -- 03/16/02 19:29				REPORT PERIOD 02/01/02 00:00 -- 03/31/02 23:59			
	TOTAL COUNT	ERROR COUNT	ERROR PERCENT	ELAPSED TIME	TOTAL COUNT	ERROR COUNT	ERROR PERCENT	ELAPSED TIME
MIGRATE								
PRIMARY - ML1	3	0	0	0:00:18	1,395	117	8	2:38:29
PRIMARY - ML2	36	1	3	0:42:48	15,558	1,424	9	106:14:56
ML1 - ML2	0	0	0	0:00:00	895	0	0	6:38:41
TOTAL	39	1	3	0:43:06	17,848	1,541	9	115:32:06
RECALL								
ML1 - PRIMARY	0	0	0	0:00:00	199	8	4	1:06:12
ML2 - PRIMARY	3	0	0	0:07:59	1,579	41	3	93:14:38
TOTAL	3	0	0	0:07:59	1,778	49	3	94:20:50
BACKUP								
DAILY	1,071	49	5	10:00:40	44,617	1,068	2	686:52:28
SPILL	0	0	0	0:00:00	0	0	0	0:00:00
TOTAL	1,071	49	5	10:00:40	44,617	1,068	2	686:52:28
DELETE								
PRIMARY	0	0	0	0:00:00	0	0	0	0:00:00
MIGRATED	275	0	0	2:02:12	15,198	3,275	22	21:50:41
TOTAL	275	0	0	2:02:12	15,198	3,275	22	21:50:41
RECYCLE								
MIGRATE VOLUME	0	0	0	0:00:00	8,355	8	0	37:24:19
BACKUP VOLUME	0	0	0	0:00:00	9,981	23	0	34:03:31
TOTAL	0	0	0	0:00:00	18,336	31	0	71:27:49
RECOVER	0	0	0	0:00:00	25	8	32	0:59:08
DUMP	0	0	0	0:00:00	68	11	16	21:00:03
RESTORE	0	0	0	0:00:00	0	0	0	0:00:00

Figure 98. REPORT-20 ACTIVITY SUMMARY

The report contains the following data:

- DFHSM Function
- Last 24 House
  - Total Count
  - Error Count
  - Error Percent
  - Elapsed Time
- Reporting Period
  - Total Count
  - Error Count
  - Error Percent
  - Elapsed Time

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Report-21 MIGRATED DATASET SUMMARY

This report lists all migration activity by days aged. It shows summary information for all datasets migrated to ML1 storage, and datasets migrated to ML2 storage.

HSM OPTIMIZER 6.1 — MIGRATED DATASET SUMMARY — PAGE 2
REPORT: 21 FORMAT: 10 — 02/11/02 - 02/13/02 — REPORT TIME: 9:02 DATE: 2/14/02

	---- MIGRATION LEVEL 1 ----			---- MIGRATION LEVEL 2 ----		
DAYS	DATASETS	AVERAGE SIZE	TOTAL SIZE	DATASETS	AVERAGE SIZE	TOTAL SIZE
1	2	3.32M	6.63M	758	11.4M	8.48G
2	0	0.00K	0.00K	497	6.95M	3.37G
3	0	0.00K	0.00K	379	3.57M	1.32G
4	0	0.00K	0.00K	139	5.43M	754M
5	0	0.00K	0.00K	90	22.2M	1.96G
6	0	0.00K	0.00K	223	8.20M	1.79G
7	0	0.00K	0.00K	137	10.7M	1.43G
8	0	0.00K	0.00K	231	12.4M	2.81G
9	0	0.00K	0.00K	202	13.3M	2.63G
10	0	0.00K	0.00K	112	4.51M	504M
15	6	2.72M	16.3M	3,203	3.29M	10.2G
20	0	0.00K	0.00K	1,614	4.84M	7.64G
25	0	0.00K	0.00K	689	6.46M	4.34G
30	0	0.00K	0.00K	872	7.82M	6.66G
40	0	0.00K	0.00K	1,029	9.60M	9.65G
50	0	0.00K	0.00K	893	12.9M	11.2G
60	0	0.00K	0.00K	1,172	6.29M	7.20G
70	0	0.00K	0.00K	790	7.12M	5.49G
80	0	0.00K	0.00K	742	10.2M	7.40G
90	0	0.00K	0.00K	481	6.31M	2.96G
100	0	0.00K	0.00K	679	8.77M	5.82G
125	0	0.00K	0.00K	1,586	7.56M	11.7G
150	0	0.00K	0.00K	1,896	6.81M	12.6G
175	0	0.00K	0.00K	1,255	8.68M	10.6G
200	0	0.00K	0.00K	1,714	6.13M	10.2G
250	0	0.00K	0.00K	2,768	7.70M	20.8G
300	0	0.00K	0.00K	2,612	6.42M	16.3G
350	0	0.00K	0.00K	2,367	7.20M	16.6G
400	0	0.00K	0.00K	3,039	6.01M	17.8G
450	0	0.00K	0.00K	2,030	6.06M	12.0G
500	0	0.00K	0.00K	2,709	6.32M	16.7G
600	0	0.00K	0.00K	3,658	4.64M	16.5G
700	0	0.00K	0.00K	4,806	5.52M	25.9G
800	3	6.53M	19.5M	4,527	4.11M	18.1G
900	0	0.00K	0.00K	4,238	4.34M	17.9G
1000	0	0.00K	0.00K	5,391	4.62M	24.3G
1250	0	0.00K	0.00K	9,512	3.62M	33.6G
1500	0	0.00K	0.00K	8,025	2.96M	23.1G
1750	0	0.00K	0.00K	6,722	2.43M	15.9G
2000	0	0.00K	0.00K	4,025	1.93M	7.57G
OVER	0	0.00K	0.00K	4,882	3.11M	14.8G
TOTAL	11	3.86M	42.5M	92,694	4.94M	447G

Figure 99. REPORT-21 MIGRATED DATASET SUMMARY

The report contains:

- Age in Days
- Migration Level 1 Information
  - Number of Datasets
  - Average Dataset Size
  - Total Size of Datasets Migrated
- Migration Level 2 Information
  - Number of Datasets
  - Average Dataset Size
  - Total Size of Datasets Migrated

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Report-22 DATASET BACKUP SUMMARY

This report presents a summary, by dataset age, of DFHSM backup activity for the reporting period. Since you may specify that multiple versions of a backed up dataset be retained, summaries are presented for versions 1 through 4, and for retained versions of 5 or greater.

If you have many datasets that have been retained for more than a year or two, you might want to investigate how many of these datasets are still valid. Deleting a dataset does not automatically delete a DFHSM backup copy of the dataset.

```
HSM OPTIMIZER  6.1                              DATASET BACKUP SUMMARY                                          PAGE   3
REPORT: 22 FORMAT: 11                             02/11/02 - 02/13/02                  REPORT TIME:  9:02  DATE:  2/14/02

          ---- TOTAL ----      ---- VER 1 ----      ---- VER 2 ----      ---- VER 3 ----      ---- VER 4 ----      ---- VER 5+ ---

 DAYS     DATASETS   SIZE      DATASETS   SIZE      DATASETS   SIZE      DATASETS   SIZE      DATASETS   SIZE      DATASETS   SIZE

    1        1,636  18.3G         1,454  14.7G           182  3.59G             0  0.00K             0  0.00K             0  0.00K
    2        1,168  9.81G           933  5.85G           101  1.45G           134  2.51G             0  0.00K             0  0.00K
    3            0  0.00K             0  0.00K             0  0.00K             0  0.00K             0  0.00K             0  0.00K
    4            8   970M             8   970M             0  0.00K             0  0.00K             0  0.00K             0  0.00K
    5        1,743  10.5G         1,391  7.38G           150   441M            91  1.37G           111  1.42G             0  0.00K
    6        1,519  8.32G         1,157  4.84G           114   485M            52   278M            96  1.66G           100  1.08G
    7        1,240  7.09G           966  4.59G            65   971M            76   140M            39   174M            94  1.24G
    8          750  7.51G           558  4.88G            57   155M            49   257M            20   202M            66  2.03G
    9        2,040  7.62G         1,649  4.22G           211  2.08G            42  50.7M            92  34.4M            46  1.23G
   10            0  0.00K             0  0.00K             0  0.00K             0  0.00K             0  0.00K             0  0.00K
   15        4,982  30.2G         4,275  20.5G           194  4.77G           299  3.13G            70   363M           144  1.49G
   20        2,746  16.0G         2,358  9.88G           146  1.09G           113  2.23G            78  1.80G            51  1.06G
   25        5,890  25.0G         3,156  10.3G           651  4.22G           640  3.04G           823  4.89G           620  2.56G
   30        5,206  26.3G         4,441  16.0G           167  2.53G           133  2.59G           144  2.02G           321  3.17G
   40        5,900  33.0G         5,032  18.6G           377  2.90G           155  2.71G           114  2.77G           222  6.02G
   50        7,392  26.7G         5,955  20.3G         1,226  4.52G            78  1.07G            58   390M            75   364M
   60        5,081  18.9G         4,278  14.8G           636  3.23G            74   596M            64   138M            29   180M
   70        6,181  23.5G         5,372  16.4G           230  1.15G           390  3.18G           105  1.40G            84  1.43G
   80        6,713  23.4G         5,186  16.6G           138   966M         1,179  4.31G            98   811M           112   819M
   90        4,353  13.2G         3,756  10.5G            31   260M           488  1.56G            51   307M            27   579M
  100        5,776  18.1G         5,278  15.4G            82   260M           107   961M           248  1.18G            61   422M
  125       13,611  48.9G        11,527  35.8G           178  2.44G           104   855M         1,627  6.83G           175  2.99G
  150       15,363  46.7G        13,242  36.9G           178  1.19G           101  1.53G           117  1.34G         1,725  5.75G
  175       12,660  35.1G        12,185  31.3G           179  2.46G            80   194M            58   452M           158   714M
  200       12,754  35.9G        12,363  29.7G           174  1.94G            87  1.41G            62   927M            68  1.95G
  250       25,284  74.9G        24,504  64.8G           319  4.60G           221  2.90G           122  1.43G           118  1.15G
  --           --     --           --     --            --     --            --     --            --     --            --     --
  700       50,807  90.4G        50,464  87.9G           275  2.10G            33   201M             6  23.1M            29   267M
  800       45,449  71.9G        45,156  71.0G           180   651M            61  86.1M             8  4.61M            44   115M
  900        9,234  38.0G         9,168  37.3G            54   534M             3   168M             2   496K             7  5.56M
 1000        7,318  32.6G         7,251  32.5G            46  33.6M             6  8.51M             5  8.14M            10  12.8M
 1250       13,543  49.8G        13,447  49.2G            54   544M            12  18.9M             5   583K            25  61.7M
 1500        8,612  27.6G         8,490  24.9G            40   536M            16  28.2M            18  31.7M            48  2.12G
 1750        7,883  18.6G         7,452  18.0G            44  82.7M            13  8.83M            16  1.16M           358   587M
 2000        5,496  12.0G         5,460  11.9G            17   164M             2  1.18M             3  2.23M            14  12.0M
 OVER

TOTAL      489,375  1.30T       461,410  1.11T         9,853  71.5G         6,211  44.2G         5,258  37.4G         6,643  47.2G
```

Figure 100. REPORT-22 DATASET BACKUP SUMMARY

The report contains the following data:

- Dataset Age in Days
- Total
  - Datasets
  - Size
- Backup Version 1 through Version 4
  - Datasets
  - Size
- Backup Versions 5 and above
  - Datasets

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- Size

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Report-23 PRIMARY VOLUMES

This report presents a list of all DFHSM primary volumes. The list is presented in serial number sequence.

```
HSM OPTIMIZER  6.1                                        PRIMARY VOLUMES                                                                  PAGE  19
REPORT: 23 FORMAT: 12                                    02/11/02 - 02/13/02                      REPORT TIME:  9:02  DATE:  2/14/02

                          THRSHLD      AUTO                                                                                  RELEAS-
VOLSER  DEVICE  MGT AGE  LOW  HI  SMS RCL  PROCESS   DATE    TIME CLASS   ORGANIZATION COUNT  ALLOC   USED  PCT  ABLE   PCT   FREE

SYS001  3390    MIG   0    0 100   NO YES  MIGRATE 00/00/00  0:00           DSORG=PS       7  36.7M  36.7M  100  0.00K    0
                                           BACKUP  02/10/02 21:28           DSORG=PSU      2  14.0M  14.0M  100  0.00K    0
                                           DUMP    02/03/02 11:08 OFFSITE   DSORG=PO       3  14.4M  7.90M   55  5.49M   38
                                           DUMP    02/03/02 11:08 ONSITE    DSORG=VS       7  17.4M  17.4M  100  0.00K    0
                                                                            TOTAL         19  82.7M  76.1M   92  5.49M    7   732M

SYS002  3390    MIG   0    0 100   NO YES  MIGRATE 00/00/00  0:00           DSORG=PS       4  17.0M  17.0M  100  0.00K    0
                                           BACKUP  02/10/02 21:30           DSORG=PSU      1  1.01M  1.01M  100  0.00K    0
                                           DUMP    02/10/02 11:03 OFFSITE   TOTAL          5  18.0M  18.0M  100  0.00K    0   790M
                                           DUMP    02/10/02 11:03 ONSITE

SYS003  3390    MIG   0    0 100   NO YES  MIGRATE 00/00/00  0:00           DSORG=PS       4  35.2M  35.2M  100  0.00K    0
                                           BACKUP  02/10/02 21:30           DSORG=PSU      1  12.6M  12.6M  100  0.00K    0
                                           DUMP    02/10/02 11:04 OFFSITE   DSORG=DA       1   861K   861K  100  0.00K    0
                                           DUMP    02/10/02 11:04 ONSITE    TOTAL          6  48.6M  48.6M  100  0.00K    0   760M

TMM000  3390    MIG   0    1   1  YES  NO  MIGRATE 07/10/97  4:45           TOTAL          0  0.00K  0.00K    0  0.00K    0  0.00K
                                           BACKUP  07/10/97  0:40
                                           DUMP    00/00/00 00:00

TMM001  3390    MIG   0    1   1  YES  NO  MIGRATE 07/10/97  4:45           TOTAL          0  0.00K  0.00K    0  0.00K    0  0.00K
                                           BACKUP  07/10/97  0:40
                                           DUMP    00/00/00 00:00

TMM002  3390    MIG   0    1   1  YES  NO  MIGRATE 07/10/97  4:45           TOTAL          0  0.00K  0.00K    0  0.00K    0  0.00K
                                           BACKUP  07/10/97  0:41
                                           DUMP    00/00/00 00:00

TMM003  3390    MIG   0    1   1  YES  NO  MIGRATE 07/10/97  4:45           TOTAL          0  0.00K  0.00K    0  0.00K    0  0.00K
                                           BACKUP  07/10/97  0:41
                                           DUMP    00/00/00 00:00

TMM004  3390    MIG   0    1   1  YES  NO  MIGRATE 07/10/97  4:45           TOTAL          0  0.00K  0.00K    0  0.00K    0  0.00K
                                           BACKUP  07/10/97  0:41
                                           DUMP    00/00/00 00:00

TMM005  3390    MIG   0    1   1  YES  NO  MIGRATE 07/10/97  4:45           TOTAL          0  0.00K  0.00K    0  0.00K    0  0.00K
                                           BACKUP  07/10/97  0:41
                                           DUMP    00/00/00 00:00

TOTAL                                                                       DSORG=PS    6669  25.2G  20.9G   83  1.21G    5
                                                                            DSORG=PSU      6  31.0M  31.0M  100  0.00K    0
                                                                            DSORG=PO    4927  44.6G  31.1G   70  6.98G   16
                                                                            DSORG=DA       8  40.5M  40.5M  100  0.00K    0
                                                                            DSORG=VS    3205  44.7G  44.7G  100  0.00K    0
                                                                            TOTAL      14815   114G  96.9G   85  8.19G    7  56.0G
```

Figure 101. REPORT-23 PRIMARY VOLUMES

The data presented is:

- The DASD volume serial number.
- The DASD device type.
- The management technique used by DFHSM on the volume.
- The age in days that DFHSM uses to determine migration eligibility for datasets on the volume.
- The low and high thresholds used by DFHSM to determine when to do migration on the volume, and how many datasets to remove from the volume. These values are expressed as percentages of total data capacity of the volume.
- A list of each process done on the volume, followed by the date and time the process was last completed within the reporting period. For volume dumps, there is an indication if the dump process resulted in an onsite or offsite dump.
- The organization column lists the various dataset organizations processed by DFHSM. If the organization is ???, these datasets cannot be processed by DFHSM.

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- The number of datasets of each organization on the volume.
- The specified allocation size for each category of dataset organization on the volume. This is followed by the amount of the allocation actually used, the percentage actually used, the amount of storage that could be released and the percentage releasable.
- The total free storage on the volume.

If a volume contains DSORGs indicated as ???, you should investigate the volume for datasets that have been allocated but never opened.

You might also consider using the DFHSM compress option for PDS datasets, if such datasets indicate a high percentage of free space. Many PDS datasets are allocated with a large primary allocation so that they will not run out of room. If you use the DFHSM compress option, you can use a primary allocation that will hold the normal contents of the dataset, and specify a secondary allocation to handle expansion. During DFHSM migration volume processing, these datasets will be migrated, then recalled with a new allocation contain the contents within a primary allocation. This will free any unused space within the dataset. The secondary allocation will still handle expansion (to keep from fragmenting the file, consider using a secondary allocation at least as large as the primary allocation).

If you use the compress option, be sure that you set the number of extents appropriately. MVS systems consider 5 extents to be a primary allocation. Therefore, set the number of extents to at least 6.

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Report-24 PRIMARY VOLUME DETAIL

This report presents a list of all DFHSM primary volumes. The list is presented in volume serial number sequence.

```
HSM OPTIMIZER  6.1                          PRIMARY VOLUME DETAIL                                    PAGE 313
REPORT: 24 FORMAT: 13                          02/11/02 - 02/13/02                 REPORT TIME:  9:02  DATE:  2/14/02

VOLSER DATASET NAME                          CREATE   EXPIRE   REF DATE TYPE ALLOC  USED  RLSE XT ORG RCFM LRECL BLKSZ SMS SC

SMS585 GSA5.AI.L0000.DBS.AI1LPTH.DATA        02/14/02 02/22/12 02/14/02 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.AI.L0000.DBS.AI1LPTH.INDEX       02/14/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.CM.P0000.DBS.CM1PGTR.DATA        02/13/02 02/21/12 02/13/02 CYL  5.05M 5.05M 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.CM.P0000.DBS.CM1PGTR.INDEX       02/13/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.IC.A0000.DBS.IC1ANDX.DATA        02/09/02 02/17/12 02/13/02 TRK   344K  344K 0.00K  5 VS  U        0  4096  Y  PR
SMS585 GSA5.IC.A0000.DBS.IC1ANDX.INDEX       02/09/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.IC.P0000.DBS.IC1PPEN.DATA        02/09/02 02/17/12 02/14/02 TRK  1.01M 1.01M 0.00K  2 VS  U        0  4096  Y  PR
SMS585 GSA5.IC.P0000.DBS.IC1PPEN.INDEX       02/09/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.OU.A0000.DBS.OU1ANDX.DATA        02/09/02 02/17/12 02/14/02 TRK   287K  287K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.OU.A0000.DBS.OU1ANDX.INDEX       02/09/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.PF.P0000.DBS.PF1PNME.DATA        02/14/02 02/22/12 02/14/02 TRK   114K  114K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.PF.P0000.DBS.PF1PNME.INDEX       02/14/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.PJ.P0000.DBS.PJ1PATR.DATA        02/13/02 02/21/12 02/13/02 CYL  6.73M 6.73M 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.PJ.P0000.DBS.PJ1PATR.INDEX       02/13/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.XL.P0000.DBS.XL1PNDX.INDEX       02/14/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.ZZ.P0000.DBS.PENPTYP.DATA        02/13/02 02/21/12 02/13/02 TRK   172K  172K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA5.ZZ.P0000.DBS.PENPTYP.INDEX       02/13/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA7.OM.K0000.DBS.OMEEAIX.DATA        02/05/02 02/13/12 02/14/02 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA7.OM.K0000.DBS.OMEEAIX.INDEX       02/05/02 00/00/00 00/00/00 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA7.PI.K0000.DBS.PIEEMST.DATA        01/25/02 02/02/12 02/14/02 CYL   225M  225M 0.00K  7 VS  U        0  4096  Y  PR
SMS585 GSA7.PI.K0000.DBS.PIEEMST.INDEX       01/25/02 00/00/00 00/00/00 TRK   344K  344K 0.00K  3 VS  U        0  4096  Y  PR
SMS585 GSA7.PP.K0000.DBS.PPEEMST.DATA        02/13/02 02/21/12 02/14/02 CYL  62.2M 62.2M 0.00K 18 VS  U        0  4096  Y  PR
SMS585 GSA7.PP.K0000.DBS.PPEEMST.INDEX       02/13/02 00/00/00 00/00/00 TRK   114K  114K 0.00K  2 VS  U        0  4096  Y  PR
SMS585 SYS1.VTOCIX.SMS585                    07/16/01 00/00/00 00/00/00 TRK  2.47M 2.47M 0.00K  1 PS  F     2048  2048  Y
SMS585 SYS1.VVDS.VSMS585                     12/13/01 00/00/00 00/00/00 TRK   574K  574K 0.00K  1 VS           0  4096  Y  PR
```

Figure 102. REPORT-24 PRIMARY VOLUME DETAIL

The data presented is:

- The volume serial number.
- The dataset name.
- The creation, expiration, and last referenced date of the dataset.
- The type of physical allocation on the device.
- The number of bytes allocated, and the number of bytes actually used.
- The number of bytes that could be released.
- The number of extents used by the file.
- The organization, record format, logical record size, and block size of the dataset.
- Whether or not DFSMS is used to manage the dataset.
- The security on the dataset. Note that all VSAM files will indicate a security of PR. Any non VSAM files with a security indicate that OS password protection applies to the file. This might indicate an error if your installation uses an external security manager.

  Possible values:

  RF RACF discrete profile

  PR OS password to read

  PW OS password to write

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Report-25 PRIMARY VOLUME DATE REFERENCE DETAIL

This report presents a list of all datasets on primary volumes in reference date order. The date starts with the oldest reference date to most current. It presents the same data as the Primary Volume Detail report.

If this report indicates a fair number of large datasets on primary datasets with fairly old reference dates, there might be a problem with your ARCCMDxx specifications. Datasets not frequently referenced should not be occupying primary volume space. Such space could probably be put to better use by your installation.

The report format will be the same as the Primary Volume Detail Report.

```
HSM OPTIMIZER  6.1                    PRIMARY VOLUME DATE REFERENCE DETAIL                                    PAGE 273
REPORT: 25 FORMAT: 13                          02/11/02 - 02/13/02                  REPORT TIME:  9:39  DATE:  2/14/02

VOLSER DATASET NAME                          CREATE   EXPIRE  REF DATE TYPE ALLOC  USED  RLSE XT ORG RCFM LRECL BLKSZ SMS SC

SMS585 GSA4.PI.B0000.DBS.PI0BNRL.DATA      01/20/02 01/28/12 02/14/02 CYL  4.20M 4.20M 0.00K  2 VS  U        0  4096  Y  PR
SMS585 GSA4.PL.B0000.DBS.PL0BILL.DATA      01/29/02 02/06/12 02/14/02 TRK  8.63M 8.63M 0.00K 18 VS  U        0  4096  Y  PR
SMS585 GSA4.PU.B0000.DBS.PU0BNRL.DATA      01/20/02 01/28/12 02/14/02 TRK   918K  918K 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA4.SE.B0000.DBS.SE0BHST.DATA      01/29/02 02/06/12 02/14/02 CYL  63.0M 63.0M 0.00K  1 VS  U        0  4096  Y  PR
SMS585 GSA4.SP.B0000.DBS.SP0BERM.DATA      02/03/02 02/11/12 02/14/02 CYL   861K  861K 0.00K  1 VS  U        0  4096  Y  PR
SMS900 CATALOG.MASTER                      09/07/95 00/00/00 02/14/02 CYL  2.52M 2.52M 0.00K  1 VS  U        0  4096  Y  PR
SMS900 CATALOG.SYSTEMS                     09/01/95 09/09/05 02/14/02 CYL  11.7M 11.7M 0.00K 14 VS  U        0  4096  Y  PR
SMS900 CATALOG.TEST                        09/01/95 09/09/05 02/14/02 CYL  6.73M 6.73M 0.00K  4 VS  U        0  4096  Y  PR
SMS900 SYSX.ATPA.ISPMLIB                   11/25/97 00/00/00 02/14/02 CYL   861K  172K 0.00K  1 PO  FB      80  6160  Y
SMS900 SYSX.ATPA.ISPSLIB                   11/25/97 00/00/00 02/14/02 CYL   861K  114K 0.00K  1 PO  FB      80  6160  Y
SMS900 SYSX.ATPA.PLILINK                   06/05/97 00/00/00 02/14/02 TRK  1.07M 1.07M 0.00K  1 PO  U        0 32760  Y
SMS900 SYSX.NETVIEW.CNM02.DSILIST          06/08/00 00/00/00 02/14/02 CYL   861K 0.00K 0.00K  1 PO  FB      80  6160  Y
SMS900 SYSX.NETVIEW.CNM02.DSIPRF           06/08/00 00/00/00 02/14/02 CYL   861K 0.00K 0.00K  1 PO  FB      80  3920  Y
SMS900 SYSX.NETVIEW.CNM02.SEZLPNLU         06/08/00 00/00/00 02/14/02 CYL   861K 0.00K 0.00K  1 PO  FB      80  3920  Y
SMS900 SYSX.OSEM.VER55.TEST.PARMLIB        11/16/00 00/00/00 02/14/02 BLK  2.07M 0.00K 0.00K  2 PO  FB      80 32720  Y
SMS900 SYSX.OSEM.VER56.ISPCLIB             01/31/02 00/00/00 02/14/02 CYL  10.0M 0.00K 0.00K  3 PO  FB      80 23440  Y
SMS900 SYSX.OSEM.VER56.ISPPLIB             01/31/02 00/00/00 02/14/02 CYL  4.20M 0.00K 0.00K  1 PO  FB      80 23440  Y
SMS900 SYSX.OSEM.VER56.TEST.IPL.REPORT     01/31/02 00/00/00 02/14/02 BLK   516K  516K 0.00K  9 PS  VBA    125  8192  Y
SMS900 SYSX.OSEM.VER56.TEST.PARMLIB        01/31/02 00/00/00 02/14/02 BLK   459K 0.00K 0.00K  1 PO  FB      80 32720  Y
SMS900 SYS1.SMARTSMS.LOADLIB               07/22/99 00/00/00 02/14/02 TRK  4.20M 4.09M  114K  5 PO  U        0 32760  Y
SMS901 CATALOG.PROD                        09/01/95 00/00/00 02/14/02 CYL  62.2M 62.2M 0.00K 27 VS  U        0  4096  Y  PR
SMS901 SYSX.OPER.JCL                       08/28/98 00/00/00 02/14/02 CYL  29.4M 24.7M 4.20M  1 PO  FB      80  6160  Y
SYS000 SMS.ATPA.ACDS.DATA                  12/14/92 12/31/99 02/14/02 TRK  1.01M 1.01M 0.00K  1 VS  U        0  4096  N  PR
SYS000 SMS.ATPA.COMMDS.DATA                01/08/92 12/31/99 02/14/02 TRK  57.4K 57.4K 0.00K  1 VS  U        0  4096  N  PR
SYS000 SMS.ATPA.SCDS.DATA                  01/08/92 12/31/99 02/14/02 TRK  1.01M 1.01M 0.00K  1 VS  U        0  4096  N  PR
SYS000 SYS1.ATPA.PROCLIB                   09/08/95 00/00/00 02/14/02 CYL  6.73M 6.39M 0.00K  1 PO  FB      80 23440  N
SYS000 SYS1.ATPA.PROD.PROCLIB              09/07/95 00/00/00 02/14/02 CYL  2.52M  114K 1.68M  1 PO  FB      80 27920  N
SYS000 SYS1.ATPA.TEST.PROCLIB              09/07/95 00/00/00 02/14/02 CYL  2.52M  114K 1.68M  1 PO  FB      80 27920  N
SYS000 SYS1.BRODCAST                       09/08/95 00/00/00 02/14/02 CYL  4.20M 4.20M 0.00K  1 DA  F      129   129  N
SYS000 SYS1.JESPARMS                       08/13/87 00/00/00 02/14/02 CYL  2.52M 1.46M  861K  1 PO  FB      80  3120  N
SYS000 SYS1.PARMLIB                        09/08/95 00/00/00 02/14/02 CYL  1.68M 1.68M 0.00K  1 PO  FB      80 27920  N
SYS000 SYS1.PROD.HASPINDX                  02/12/96 00/00/00 02/14/02 CYL   861K  861K 0.00K  1 PS  F     4096  4096  N
SYS000 SYS1.PROD.LOGREC                    09/08/95 00/00/00 02/14/02 CYL  1.68M 1.68M 0.00K  1 PSU U        0  1944  N
SYS000 SYS1.TEST.HASPINDX                  02/12/96 00/00/00 02/14/02 CYL   861K  861K 0.00K  1 PS  F     4096  4096  N
SYS000 SYS1.UADS                           09/08/95 00/00/00 02/14/02 CYL   861K 57.4K 0.00K  1 PO  FB      172  1720  N
SYS001 SYSX.VCSS.PROD.JSA                  09/28/95 00/00/00 02/14/02 BLK   746K  746K 0.00K  1 PS  U        0  6200  N
SYS001 SYSX.VCSS.TEST.JSA                  09/29/95 00/00/00 02/14/02 BLK   746K  746K 0.00K  1 PS  U        0  6200  N
SYS001 SYS1.RACF                           09/21/95 00/00/00 02/14/02 CYL  12.6M 12.6M 0.00K  1 PSU F     4096  4096  N
SYS001 SYS1.V23.PLILINK                    12/13/93 00/00/00 02/14/02 CYL  5.89M 5.55M 0.00K  1 PO  U        0 32760  N
```

Figure 103. REPORT-25 PRIMARY VOLUME DATE REFERENCE DETAIL

The data presented is:

- The volume serial number.
- The dataset name.
- The creation, expiration, and last referenced date of the dataset.
- The type of physical allocation on the device.
- The number of bytes allocated, and the number of bytes actually used.
- The number of bytes that could be released.
- The number of extents used by the file.
- The organization, record format, logical record size, and block size of the dataset.

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- Whether or not DFSMS is used to manage the dataset.
- The security on the dataset. Note that all VSAM files will indicate a security of PR. Any non VSAM files with a security indicate that OS password protection applies to the file. This might indicate an error if your installation uses an external security manager.

  Possible values:

  RF RACF discrete profile

  PR OS password to read

  PW OS password to write

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Report-26 MIGRATED DATASET DETAIL (MCDS Sorted by DSN)

This report presents a list of all datasets migrated in dataset name order. The information presented is contained in the DFHSM Migration Control Data Set.

```
HSM OPTIMIZER  6.1                    MIGRATED DATASET DETAIL - DSN SEQUENCE                                PAGE 466
REPORT: 26 FORMAT: 14                          02/11/02 - 02/13/02                  REPORT TIME:  9:39  DATE:  2/14/02

                                  PRIM   ------ MIGRATION ------  CREATE    EXPIRE     DS    ------- SMS CLASSES --------
---------- DATASET NAME ---------- VOLUME   DATE      TIME     LVL  DATE      DATE     SIZE    MGMT       STOR       DATA

GSA7.PP.K1010.BKP.PPEEMSTA.G0100V00  SMS504  02/11/02  15:05:13   2  02/07/02  00/00/00  43.9M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1010.BKP.PPEEMSTB.G0100V00  SMS502  01/05/02  20:11:15   2  01/03/02  00/00/00  43.8M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1010.BKP.PPEEMSTB.G0101V00  SMS572  02/13/02  14:21:00   2  02/05/02  00/00/00  45.0M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1010.BKP.PPEEMSTB.G0102V00  SMS505  02/13/02  13:08:39   2  02/07/02  00/00/00  45.0M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K155T.FIL.ZZKFINDH           SMS503  01/15/02  16:12:14   2  01/03/02  00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K155T.FIL.ZZKFINDL           SMS572  01/31/02   6:05:18   2  01/03/02  00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1550.BKP.PPEEMST.G0192V00   SMS566  01/15/02  20:17:32   2  01/03/02  00/00/00  44.3M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1550.BKP.PPEEMST.G0193V00   SMS503  01/05/02  19:11:03   2  01/03/02  00/00/00  44.3M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1550.BKP.PPEEMST.G0194V00   SMS506  01/12/02   5:00:45   2  01/11/02  00/00/00  44.5M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1550.BKP.PPEEMST.G0195V00   SMS518  01/14/02  19:08:24   2  01/11/02  00/00/00  44.5M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1550.BKP.PPEEMST.G0196V00   SMS508  02/14/02   4:13:36   2  02/13/02  00/00/00  43.9M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1570.BKP.PPEEMST.G0038V00   SMS566  01/15/02  20:17:05   2  01/07/02  00/00/00  44.5M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1570.FIL.PPEEMST.G0036V00   SMS558  01/30/02  17:11:43   2  07/05/01  00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1570.FIL.PPEEMST.G0039V00   SMS566  02/01/02   5:14:16   2  08/22/01  00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1570.FIL.PPEEMST.G0040V00   SMS563  01/30/02  19:18:56   2  10/29/01  00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K1570.FIL.PPEEMST.G0042V00   SMS504  01/28/02  19:34:42   2  11/07/01  00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K8520.FIL.MTDMAINT.G0455V00  SMS508  02/08/02   0:13:50   2  01/29/02  00/00/00   110K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K8520.FIL.MTDMAINT.G0457V00  SMS508  02/11/02  16:08:16   2  01/31/02  00/00/00   110K  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K9915.BKP.PPEEMST            SMS507  02/14/02   3:16:11   2  02/13/02  00/00/00  44.1M  STD10YR   STANDARD  COMPSEQ
GSA7.PP.K9999.BKP.PPNOTES            SMS558  01/30/02  17:18:40   2  12/07/01  00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K0758.FIL.BANKFAX            SMS508  02/08/02   0:15:28   2  01/30/02  00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K0900.BKP.SDEEMST.G0007V00   SMS558  01/30/02   4:36:39   2  01/02/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K0900.BKP.SDEEMST.G0008V00   SMS506  01/19/02   5:02:55   2  01/02/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K0900.BKP.SDEEMST.G0009V00   SMS518  01/19/02  22:16:19   2  01/16/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1000.BKP.SDPAYRL.G0007V00   SMS506  01/02/02  23:10:33   2  01/02/02  00/00/00  1.18M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1000.BKP.SDPAYRL.G0008V00   SMS505  02/05/02   5:05:51   2  01/16/02  00/00/00  1.18M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1010.BKP.SDANNUAL.G0010V00  SMS505  01/21/02   5:00:27   2  01/02/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1010.BKP.SDANNUAL.G0011V00  SMS501  01/28/02   4:54:48   2  01/16/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1010.BKP.SDEEMSTA.G0009V00  SMS507  01/14/02   5:12:30   2  01/02/02  00/00/00  1.28M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1010.BKP.SDEEMSTA.G0010V00  SMS518  01/19/02  22:16:10   2  01/16/02  00/00/00  1.28M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1010.BKP.SDEEMSTB.G0010V00  SMS563  01/29/02  23:07:26   2  01/02/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K1010.BKP.SDEEMSTB.G0011V00  SMS558  02/09/02  23:01:22   2  01/16/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K2010.FIL.BKP1099.G0001V00   SMS506  02/05/02  18:05:50   2  01/30/02  00/00/00  55.1K  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K2010.FIL.FED1099.G0001V00   SMS508  02/08/02   0:17:09   2  01/30/02  00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA7.SD.K8520.FIL.MTDMAINT.G0461V00  SMS518  02/12/02  21:08:58   2  02/02/02  00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
```

Figure 104. REPORT-26 MIGRATED DATASET DETAIL (MCDS Sorted by DSN)

The dataset presented is:

- Dataset Name
- Primary Volume - the disk volume where the dataset resided before migration.
- Migration Date
- Migration Time
- Migration Level
- Creation Date
- Expiration Date
- Dataset Size
- SMS Management Class
- SMS Storage Class
- SMS Data Class

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Report-27 BACKED UP DATASET DETAIL (BCDS Sorted by DSN With XREF)

This report presents a list of datasets which have been backed up in dataset name order with a cross-reference showing the current location of the dataset.

```
HSM OPTIMIZER  6.1                    DATASET BACKUP DETAIL - DSN SEQUENCE                                PAGE 186
REPORT: 27 FORMAT: 15                          02/11/02 - 02/13/02                  REPORT TIME:  9:39  DATE:  2/14/02

                                        PRIM  CUR ----- BACKUP -----   CREATE    EXPIRE     DS   ------- SMS CLASSES --------
---------- DATASET NAME ----------     VOLUME LOC   DATE      TIME      DATE      DATE     SIZE    MGMT      STOR      DATA

                                       SMS522  D  02/08/02  2:33:21  10/20/00  00/00/00  1.19M  SMP       STANDARD
SYS1R.SMPTLOGA                         SMS524  D  01/18/02  2:08:10  10/20/00  00/00/00  0.63K  SMP       STANDARD
SYS1R.SORTLIB                          SMS522  D  01/18/02  2:08:51  10/20/00  00/00/00   223K  SMP       STANDARD
SYS1R.SORTLPA                          SMS520  D  02/06/02  3:02:03  10/20/00  00/00/00   789K  SMP       STANDARD
SYS1R.SVCLIB                           SMS522  D  01/18/02  2:10:10  10/20/00  00/00/00  8.18K  SMP       STANDARD
SYS1R.SWITCH.LINKLIB                   SMS525  D  01/09/02  2:28:49  08/24/01  00/00/00   330K  SMP       STANDARD
                                       SMS525  D  01/26/02  2:42:11  08/24/01  00/00/00   334K  SMP       STANDARD
SYS1R.SWITCH.SOURCE                    SMS524  D  01/09/02  2:28:23  08/24/01  00/00/00   527K  SMP       STANDARD
                                       SMS524  D  01/26/02  2:36:33  08/24/01  00/00/00   533K  SMP       STANDARD
SYS1R.TCPPARMS                         SMS523  D  01/18/02  2:20:52  10/20/00  00/00/00   173K  SMP       STANDARD
SYS1R.TMON.INSTLIB                     SMS528  D  02/08/02  3:24:22  12/07/00  00/00/00   902K  SMP       STANDARD
SYS1R.TMON.LMKLOAD                     SMS525  D  02/08/02  2:51:16  12/14/00  00/00/00  3.00M  SMP       STANDARD
SYS1R.TMON.LMKSAMP                     SMS527  D  02/08/02  2:59:59  12/14/00  00/00/00  3.61M  SMP       STANDARD
SYS1R.TMON.TCEINST                     SMS523  D  02/08/02  2:35:28  12/14/00  00/00/00  13.1K  SMP       STANDARD
SYS1R.TMON.TCELOAD                     SMS522  D  02/09/02  2:38:50  12/14/00  00/00/00  4.37M  SMP       STANDARD
SYS1R.TMON.TCESAMP                     SMS520  D  02/09/02  2:35:47  12/14/00  00/00/00  2.26M  SMP       STANDARD
SYS1R.TMON.USEREXIT.LOAD               SMS524  D  02/08/02  2:32:10  12/18/00  00/00/00  3.89K  SMP       STANDARD
SYS1R.VPS.LINKLIB                      SMS521  D  01/12/02  2:06:18  11/13/00  00/00/00  3.74M  SMP       STANDARD  PDS
SYS1R.VTAMLIB                          SMS524  D  02/08/02  2:35:52  10/20/00  00/00/00  9.63M  SMP       STANDARD
SYS1R.VTAMLST                          SMS529  D  01/19/02  2:59:37  10/20/00  00/00/00  4.45K  SMP       STANDARD
SYS1S.SHASLINK                         SMS529  D  02/09/02  2:43:44  11/01/01  00/00/00  1.78M  SMP       STANDARD
SYS1S.SHASMAC                          SMS525  D  01/12/02  2:08:59  08/23/01  00/00/00  20.6M  SMP       STANDARD  PDSE
USFTUN1.FTP4.CO.B9102.FIL.RDY.ELIG     SMS558  D  02/14/02  2:58:17  02/13/02  00/00/00  13.1K  TSO       STANDARD  COMPSEQ
USFTUN1.FTP4.CO.B9102.FIL.RDY.MELIG    SMS558  X  01/12/02  1:52:14            00/00/00  13.1K  TSO       STANDARD  COMPSEQ
USFTUN1.FTP4.GE.B0620.FIL.RDY.HIPAA    SMS506  X  01/09/02  1:26:56            00/00/00  13.1K  TSO       STANDARD  COMPSEQ
USFTUN1.FTP4.GE.B9102.FIL.RDY.ELIG     SMS566  X  01/09/02  2:15:44            00/00/00  13.1K  TSO       STANDARD  COMPSEQ
USFTUN1.FTP4.GE.B9202.FIL.RDY.MBRS     SMS559  X  01/09/02  2:11:37            00/00/00  13.1K  TSO       STANDARD  COMPSEQ
                                       SMS506  X  02/05/02  1:37:31            00/00/00  13.1K  TSO       STANDARD  COMPSEQ
USFTUN1.GSA5.OT.P0308.FIL.OT1PHLD      SMS508  X  01/01/02  1:57:23            00/00/00  1.14M  TSO       STANDARD  COMPSEQ
                                       SMS559  X  01/09/02  2:11:28            00/00/00  1.14M  TSO       STANDARD  COMPSEQ
                                       SMS566  M  02/05/02  2:53:01  02/02/02  00/00/00  1.14M  TSO       STANDARD  COMPSEQ

                    TOTAL DATASETS:     38,587     TOTAL SIZE:    216G
```

Figure 105. REPORT-27 BACKED UP DATASET DETAIL (BCDS Sorted by DSN With XREF)

The data presented is:

- Dataset Name
- Primary Volume - the disk volume where the dataset resided before it was either backed up or migrated.
- Current Location - this is the cross-reference information. This information is collect ed by reading the catalog for each dataset. The codes have the following meanings:

  compact,tsize=3.

  D Dataset resides on disk.

  M Dataset has been migrated.

  X Dataset has been deleted.

- Backup Date
- Backup Time
- Creation Date
- Expiration Date
- Dataset Size
- SMS Management Class

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- SMS Storage Class
- SMS Data Class

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Report-28 MIGRATED DATASET DETAIL (MCDS Sorted by Date)

This report presents a list of all datasets which have been migrated. The information presented is from the Migration Control Data Set sorted by date migrated.

```
HSM OPTIMIZER  6.1                        MIGRATED DATASET DETAIL - DATE SEQUENCE                                  PAGE 383
REPORT: 28 FORMAT: 14                              02/11/02 - 02/13/02                  REPORT TIME:  9:39  DATE:  2/14/02

                                          PRIM   ------ MIGRATION ------  CREATE    EXPIRE     DS   ------- SMS CLASSES --------
--------------- DATASET NAME ---------------- VOLUME   DATE      TIME    LVL  DATE      DATE     SIZE   MGMT      STOR      DATA

GSA4.OI.B1033.FIL.PBHELIG                    SMS566  02/14/02  5:26:39   2  01/31/02  00/00/00   438K  STD10YR   STANDARD  COMPSEQ
GSA5.PH.P5030.BKP.PH1PPTR.G0335V00           SMS563  02/14/02  5:27:49   2  02/01/02  00/00/00  40.5M  STD10YR   STANDARD  COMPSEQ
SPJRT.VER55.EXPR.QUERY                       SMS572  02/14/02  5:28:06   2  01/31/02  00/00/00   242K  TSO       STANDARD  COMPSEQ
GSA4.XI.B4120.FIL.AFP.LABELS                 SMS572  02/14/02  5:28:09   2  01/31/02  00/00/00  34.9K  STD10YR   STANDARD  COMPSEQ
GSA4.UA.B4165.FIL.UA1BERM                    SMS572  02/14/02  5:28:12   2  01/31/02  00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA4.PH.B4175.FIL.PH0BERM.G0017V00           SMS572  02/14/02  5:28:16   2  01/31/02  00/00/00   548K  STD10YR   STANDARD  COMPSEQ
GSA4.AI.B0801.FIL.ACTGRPT                    SMS572  02/14/02  5:28:19   2  01/30/02  00/00/00   493K  STD10YR   STANDARD  COMPSEQ
GSA4.LC.B0801.FIL.ACTGRPT                    SMS572  02/14/02  5:28:23   2  01/31/02  00/00/00   384K  STD10YR   STANDARD  COMPSEQ
GSA4.SY.B1015.FIL.AFP.LABELS                 SMS572  02/14/02  5:28:26   2  01/31/02  00/00/00  38.4K  STD10YR   STANDARD  COMPSEQ
SPHGR.OSEM.VER55.GEN2.ISPPLIB                SMS572  02/14/02  5:28:31   2  08/06/01  00/00/00  3.28M  TSO       STANDARD  PDSE
GSA5.CK.P5035.BKP.CK1PPEN.G0109V00           SMS572  02/14/02  5:28:34   2  01/31/02  00/00/00   329K  STD10YR   STANDARD  COMPSEQ
GSA4.WI.B080B.FIL.GENACTG.G0053V00           SMS572  02/14/02  5:28:38   2  01/31/02  00/00/00   712K  STD10YR   STANDARD  COMPSEQ
SPHGR.OSEM.VER56.QATESTS                     SMS572  02/14/02  5:28:43   2  10/01/01  00/00/00  1.45M  TSO       STANDARD  PDSE
GSA4.CD.B0810.FIL.L101YTD.G0089V00           SMS572  02/14/02  5:28:46   2  01/31/02  00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
GSA4.PT.B4125.FIL.UNPBILL                    SMS572  02/14/02  5:28:49   2  01/31/02  00/00/00   329K  STD10YR   STANDARD  COMPSEQ
GSA5.CD.A5130.FIL.CD1ADET                    SMS572  02/14/02  5:28:55   2  02/02/02  00/00/00  5.19M  STD10YR   STANDARD  COMPSEQ
GSA5.CY.P0101.FIL.CYPNOTE.G0032V00           SMS572  02/14/02  5:28:58   2  02/02/02  00/00/00   428K  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.D8509.BKP.VCHRN.G2703V00             SMS572  02/14/02  5:29:02   2  02/02/02  00/00/00   931K  STD10YR   STANDARD  COMPSEQ
SPKAS.OSEM.VER55.MANUAL.G0002V00             SMS572  02/14/02  5:29:12   2  01/18/01  00/00/00  2.49M  TSO       STANDARD  PDS
GSA5.CT.Q0700.FIL.MSTBK                      SMS572  02/14/02  5:29:15   2  02/02/02  00/00/00   438K  STD10YR   STANDARD  COMPSEQ
GSA3.Z0.I1010.FIL.SELJRNL.G2179V00           SMS572  02/14/02  5:29:19   2  02/02/02  00/00/00  1.23M  STD10YR   STANDARD  COMPSEQ
GSA5.CK.P5030.BKP.CK1PPTR.G0604V00           SMS572  02/14/02  5:29:22   2  02/02/02  00/00/00  1.34M  STD10YR   STANDARD  COMPSEQ
GSA4.BE.B9120.BKP.BE0BMBR.G0051V00           SMS572  02/14/02  5:29:26   2  02/02/02  00/00/00  2.26M  STD10YR   STANDARD  COMPSEQ
GSA4.BS.B9120.BKP.BS0BMBR.G0052V00           SMS572  02/14/02  5:29:38   2  02/02/02  00/00/00  12.6M  STD10YR   STANDARD  COMPSEQ
GSA4.TY.B9120.BKP.TY0BMBR.G0051V00           SMS572  02/14/02  5:29:42   2  02/02/02  00/00/00  2.67M  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.C1002.FIL.MEDTRANS.G3382V00          SMS572  02/14/02  5:29:47   2  02/02/02  00/00/00  3.42M  STD10YR   STANDARD  COMPSEQ
GSA2.AI.M7090.FIL.BOEHM.FLAT                 SMS572  02/14/02  5:29:50   2  02/03/02  00/00/00  1.00M  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M3509.FIL.LOGCHK.G3394V00            SMS572  02/14/02  5:29:54   2  02/02/02  00/00/00  3.16M  STD10YR   STANDARD  COMPSEQ
GSA2.NB.M7090.FIL.BOEHM.G0079V00             SMS572  02/14/02  5:29:57   2  02/03/02  00/00/00  43.5K  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.C3502.FIL.PORTLAND.G1054V00          SMS572  02/14/02  5:29:59   2  02/03/02  00/00/00   301K  STD10YR   STANDARD  COMPSEQ
GSA2.BS.M7090.FIL.BOEHM.G0077V00             SMS572  02/14/02  5:30:04   2  02/03/02  00/00/00  1.00M  STD10YR   STANDARD  COMPSEQ
GSA2.CI.M7090.FIL.BOEHM.G0077V00             SMS572  02/14/02  5:30:06   2  02/03/02  00/00/00   256K  STD10YR   STANDARD  COMPSEQ

MIGRATION LEVEL 1:     TOTAL DATASETS:          8     TOTAL SIZE:    22.9M
MIGRATION LEVEL 2:     TOTAL DATASETS:     10,608     TOTAL SIZE:    69.0G
```

Figure 106. REPORT-28 MIGRATED DATASET DETAIL (MCDS Sorted by Date)

The data presented is:

- Dataset Name
- Primary Volume - the disk volume where the dataset resided before migration.
- Migration Date
- Migration Time
- Migration Level
- Creation Date
- Expiration Date
- Dataset Size
- SMS Management Class
- SMS Storage Class
- SMS Data Class

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Report-29 BACKED UP DATASET DETAIL (BCDS Sorted by Date With XREF)

This report presents a list of all datasets backed up in backup date order. The information presented is from the Backup Control Data Set.

```
HSM OPTIMIZER  6.1                    DATASET BACKUP DETAIL - DATE SEQUENCE                              PAGE  98
REPORT: 29 FORMAT: 15                        02/11/02 - 02/13/02                  REPORT TIME:  9:39  DATE:  2/14/02

                                          PRIM  CUR ----- BACKUP -----   CREATE    EXPIRE     DS   ------- SMS CLASSES --------
---------------- DATASET NAME ----------- VOLUME LOC   DATE      TIME     DATE      DATE     SIZE    MGMT      STOR      DATA

GSA4.OI.B0305.FIL.MTDCHG.G2677V00        SMS558  X  02/14/02  3:10:28             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA4.XF.B0305.FIL.MTDCHG.G2542V00        SMS558  X  02/14/02  3:10:30             00/00/00   165K  STD10YR   STANDARD  COMPSEQ
GSA4.AW.B0403.FIL.MTDCHG.G4069V00        SMS558  X  02/14/02  3:10:33             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA4.BE.B0403.FIL.MTDCHG.G1397V00        SMS558  X  02/14/02  3:10:34             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA4.GE.B0403.FIL.MTDCHG.G0873V00        SMS558  X  02/14/02  3:10:36             00/00/00   876K  STD10YR   STANDARD  COMPSEQ
GSA4.BS.B0410.FIL.MTDCHG.G1245V00        SMS558  X  02/14/02  3:10:38             00/00/00   274K  STD10YR   STANDARD  COMPSEQ
GSA4.CY.B0410.FIL.MTDCHG.G1280V00        SMS558  X  02/14/02  3:10:40             00/00/00   110K  STD10YR   STANDARD  COMPSEQ
GSA4.PT.B0410.FIL.MTDCHG.G1206V00        SMS558  X  02/14/02  3:10:41             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA4.SE.B0410.FIL.MTDCHG.G1250V00        SMS558  X  02/14/02  3:10:43             00/00/00   110K  STD10YR   STANDARD  COMPSEQ
GSA4.WI.B0410.FIL.MTDCHG.G1262V00        SMS558  X  02/14/02  3:10:44             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSAA.ZZ.CICST.DBS.DFHGCD                 SMS558  D  02/14/02  3:10:46  10/03/01   00/00/00  2.12M  SMP       STANDARD  VSAM
GSA5.AI.P5035.BKP.AI1PPTR.G0163V00       SMS518  M  02/14/02  3:11:31  02/13/02   00/00/00   122M  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.D8509.FIL.JCHECK.TOPC            SMS508  X  02/14/02  3:11:47             00/00/00  1.87M  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M3509.FIL.LOGCHK.G3402V00        SMS508  X  02/14/02  3:11:49             00/00/00  7.59M  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M0406.FIL.FRERECON.G0208V00      SMS508  X  02/14/02  3:11:55             00/00/00  13.1K  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M0406.FIL.BOARECON.G2234V00      SMS508  X  02/14/02  3:11:57             00/00/00  0.84K  STD10YR   STANDARD  COMPSEQ
GSA5.XL.P5035.FIL.XLVOID.G0151V00        SMS508  X  02/14/02  3:11:58             00/00/00  54.2K  STD10YR   STANDARD  COMPSEQ
GSA5.KC.P5035.FIL.KCSSN                  SMS508  X  02/14/02  3:12:01             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA5.PP.P5035.FIL.PPSSN                  SMS508  X  02/14/02  3:12:02             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA5.PU.P5035.FIL.PUSSN                  SMS508  X  02/14/02  3:12:03             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA5.TC.P5035.FIL.TCSSN                  SMS508  X  02/14/02  3:12:05             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA5.UA.P5035.FIL.UASSN                  SMS508  X  02/14/02  3:12:06             00/00/00  55.5K  STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M2296.FIL.FAX.OUT                SMS508  X  02/14/02  3:12:08             00/00/00  36.1K  STD10YR   STANDARD  COMPSEQ
GSA4.PL.B1300.FIL.PL0BMBR                SMS508  M  02/14/02  3:12:09  02/14/02   00/00/00  32.8M  STD10YR   STANDARD  COMPSEQ
GSA1.Z0.I1199.FIL.UPSLABEL               SMS508  X  02/14/02  3:12:31             00/00/00  43.6K  STD10YR   STANDARD  COMPSEQ
GSAE.ZZ.P0000.DBS.PENPTBL                SMS508  D  02/14/02  3:12:48  12/21/01   12/22/02   783K  TEST      STANDARD  COMPKSDS
SPJR6.ISPF.EXPR.ISPPROF                  SMS518  X  02/14/02  3:17:57             00/00/00   137K  TSO       STANDARD  PDSE
SPKAS.OSEM.VER55.CNTL.G0002V00           SMS518  X  02/14/02  3:18:01             00/00/00   842K  TSO       STANDARD  PDS
GSAE.LB.A0000.DBS.LB1APEN                SMS518  D  02/14/02  3:18:09  02/12/02   02/13/03   446M  TEST      STANDARD  COMPKSDS
GSA9.ZZ.CICSZ.FIL.DFHDMPB                SMS518  X  02/14/02  3:32:06             00/00/00  32.9K  SMP       STANDARD  COMPSEQ
GSAA.ZZ.CICST.FIL.DFHDMPB                SMS518  X  02/14/02  3:32:08             00/00/00  32.9K  SMP       STANDARD  COMPSEQ

                     TOTAL DATASETS:     38,587     TOTAL SIZE:    216G
```

Figure 107. REPORT-29 BACKED UP DATASET DETAIL (BCDS Sorted by Date With XREF)

The data presented is:

- Dataset Name
- Primary Volume - the disk volume where the dataset resided before it was either backed up or migrated.
- Current Location - this is the cross-reference information. This information is collect ed by reading the catalog for each dataset. The codes have the following meanings:

  compact,tsize=3.

  D Dataset resides on disk.

  M Dataset has been migrated.

  X Dataset has been deleted.

- Backup Date
- Backup Time
- Creation Date
- Expiration Date
- Dataset Size
- SMS Management Class

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- SMS Storage Class
- SMS Data Class

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Report-30 BACKED UP DATASET DETAIL (BCDS Sorted by DSN No XREF)

This report presents a list of all datasets backed up in dataset name order. The information presented is from the Backup Control Data Set.

HSM OPTIMIZER 6.1 — BCDS DETAIL - DSN SEQUENCE — PAGE 813
REPORT: 30 FORMAT: 16 — 02/11/02 - 02/13/02 — REPORT TIME: 9:39 DATE: 2/14/02

DATASET NAME	GEN	PRIM VOLUME	BACKUP DATE	BACKUP TIME	EXPIRE DATE	DS SIZE	SMS CLASSES MGMT	SMS CLASSES STOR	SMS CLASSES DATA
	27	SMS522	02/08/02	2:33:21	00/00/00	1.19M	SMP	STANDARD	
SYS1R.SMPTLOGA	11	SMS524	01/18/02	2:08:10	00/00/00	0.63K	SMP	STANDARD	
SYS1R.SORTLIB	11	SMS522	01/18/02	2:08:51	00/00/00	223K	SMP	STANDARD	
SYS1R.SORTLPA	12	SMS520	02/06/02	3:02:03	00/00/00	789K	SMP	STANDARD	
SYS1R.SVCLIB	11	SMS522	01/18/02	2:10:10	00/00/00	8.18K	SMP	STANDARD	
SYS1R.SWITCH.LINKLIB	9	SMS525	01/09/02	2:28:49	00/00/00	330K	SMP	STANDARD	
	10	SMS525	01/26/02	2:42:11	00/00/00	334K	SMP	STANDARD	
SYS1R.SWITCH.SOURCE	9	SMS524	01/09/02	2:28:23	00/00/00	527K	SMP	STANDARD	
	10	SMS524	01/26/02	2:36:33	00/00/00	533K	SMP	STANDARD	
SYS1R.TCPPARMS	11	SMS523	01/18/02	2:20:52	00/00/00	173K	SMP	STANDARD	
SYS1R.TMON.INSTLIB	14	SMS528	02/08/02	3:24:22	00/00/00	902K	SMP	STANDARD	
SYS1R.TMON.LMKLOAD	11	SMS525	02/08/02	2:51:16	00/00/00	3.00M	SMP	STANDARD	
SYS1R.TMON.LMKSAMP	12	SMS527	02/08/02	2:59:59	00/00/00	3.61M	SMP	STANDARD	
SYS1R.TMON.TCEINST	11	SMS523	02/08/02	2:35:28	00/00/00	13.1K	SMP	STANDARD	
SYS1R.TMON.TCELOAD	13	SMS522	02/09/02	2:38:50	00/00/00	4.37M	SMP	STANDARD	
SYS1R.TMON.TCESAMP	13	SMS520	02/09/02	2:35:47	00/00/00	2.26M	SMP	STANDARD	
SYS1R.TMON.USEREXIT.LOAD	10	SMS524	02/08/02	2:32:10	00/00/00	3.89K	SMP	STANDARD	
SYS1R.VPS.LINKLIB	14	SMS521	01/12/02	2:06:18	00/00/00	3.74M	SMP	STANDARD	PDS
SYS1R.VTAMLIB	12	SMS524	02/08/02	2:35:52	00/00/00	9.63M	SMP	STANDARD	
SYS1R.VTAMLST	11	SMS529	01/19/02	2:59:37	00/00/00	4.45K	SMP	STANDARD	
SYS1S.SHASLINK	4	SMS529	02/09/02	2:43:44	00/00/00	1.78M	SMP	STANDARD	
SYS1S.SHASMAC	5	SMS525	01/12/02	2:08:59	00/00/00	20.6M	SMP	STANDARD	PDSE
USFTUN1.FTP4.CO.B9102.FIL.RDY.ELIG	14	SMS558	02/14/02	2:58:17	00/00/00	13.1K	TSO	STANDARD	COMPSEQ
USFTUN1.FTP4.CO.B9102.FIL.RDY.MELIG	1	SMS558	01/12/02	1:52:14	00/00/00	13.1K	TSO	STANDARD	COMPSEQ
USFTUN1.FTP4.GE.B0620.FIL.RDY.HIPAA	4	SMS506	01/09/02	1:26:56	00/00/00	13.1K	TSO	STANDARD	COMPSEQ
USFTUN1.FTP4.GE.B9102.FIL.RDY.ELIG	4	SMS566	01/09/02	2:15:44	00/00/00	13.1K	TSO	STANDARD	COMPSEQ
USFTUN1.FTP4.GE.B9202.FIL.RDY.MBRS	8	SMS559	01/09/02	2:11:37	00/00/00	13.1K	TSO	STANDARD	COMPSEQ
	9	SMS506	02/05/02	1:37:31	00/00/00	13.1K	TSO	STANDARD	COMPSEQ
USFTUN1.GSA5.OT.P0308.FIL.OT1PHLD	12	SMS508	01/01/02	1:57:23	00/00/00	1.14M	TSO	STANDARD	COMPSEQ
	13	SMS559	01/09/02	2:11:28	00/00/00	1.14M	TSO	STANDARD	COMPSEQ
	14	SMS566	02/05/02	2:53:01	00/00/00	1.14M	TSO	STANDARD	COMPSEQ

TOTAL DATASETS: 38,587 TOTAL SIZE: 216G

Figure 108. REPORT-30 BACKED UP DATASET DETAIL (BCDS Sorted by DSN No XREF)

The data presented is:

- Dataset Name
- Generation - this is the DFHSM generation number, not a generation data group level number.
- Primary Volume - the disk volume where the dataset resided before it was either backed up or migrated.
- Backup Date
- Backup Time
- Expiration Date
- Dataset Size
- SMS Management Class
- SMS Storage Class
- SMS Data Class

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Report-31 BACKED UP DATASET DETAIL BY DATE

This report lists the datasets found in the BCDS in backup date sequence.

```
HSM OPTIMIZER  6.1                          BCDS DETAIL - DATE SEQUENCE                                    PAGE 528
REPORT: 31 FORMAT: 16                            02/11/02 - 02/14/02                  REPORT TIME:  9:39  DATE:  2/14/02

                                                  PRIM     ----- BACKUP -----    EXPIRE      DS     ------- SMS CLASSES --------
---------------- DATASET NAME ----------------  GEN  VOLUME     DATE      TIME      DATE      SIZE     MGMT      STOR      DATA

GSA4.OI.B0305.FIL.MTDCHG.G2677V00                1  SMS558   02/14/02  3:10:28   00/00/00  55.5K   STD10YR   STANDARD  COMPSEQ
GSA4.WI.B0410.FIL.MTDCHG.G1262V00                1  SMS558   02/14/02  3:10:44   00/00/00  55.5K   STD10YR   STANDARD  COMPSEQ
GSAA.ZZ.CICST.DBS.DFHGCD                       392  SMS558   02/14/02  3:10:46   00/00/00  2.12M   SMP       STANDARD  VSAM
GSA5.AI.P5035.BKP.AI1PPTR.G0163V00               1  SMS518   02/14/02  3:11:31   00/00/00   122M   STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.D8509.FIL.JCHECK.TOPC                16655  SMS508   02/14/02  3:11:47   00/00/00  1.87M   STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M3509.FIL.LOGCHK.G3402V00                1  SMS508   02/14/02  3:11:49   00/00/00  7.59M   STD10YR   STANDARD  COMPSEQ
GSA5.TC.P5035.FIL.TCSSN                         71  SMS508   02/14/02  3:12:05   00/00/00  55.5K   STD10YR   STANDARD  COMPSEQ
GSA2.ZZ.M2296.FIL.FAX.OUT                      216  SMS508   02/14/02  3:12:08   00/00/00  36.1K   STD10YR   STANDARD  COMPSEQ
GSA1.Z0.I1199.FIL.UPSLABEL                   16656  SMS508   02/14/02  3:12:31   00/00/00  43.6K   STD10YR   STANDARD  COMPSEQ
GSAE.ZZ.P0000.DBS.PENPTBL                      815  SMS508   02/14/02  3:12:48   12/22/02   783K   TEST      STANDARD  COMPKSDS
SPJR6.ISPF.EXPR.ISPPROF                         90  SMS518   02/14/02  3:17:57   00/00/00   137K   TSO       STANDARD  PDSE
SPKAS.OSEM.VER55.CNTL.G0002V00                  85  SMS518   02/14/02  3:18:01   00/00/00   842K   TSO       STANDARD  PDS
GSAE.LB.A0000.DBS.LB1APEN                       21  SMS518   02/14/02  3:18:09   02/13/03   446M   TEST      STANDARD  COMPKSDS
GSA9.ZZ.CICSZ.FIL.DFHDMPB                      254  SMS518   02/14/02  3:32:06   00/00/00  32.9K   SMP       STANDARD  COMPSEQ
GSAA.ZZ.CICST.FIL.DFHDMPB                      266  SMS518   02/14/02  3:32:08   00/00/00  32.9K   SMP       STANDARD  COMPSEQ

                      TOTAL DATASETS:     38,587     TOTAL SIZE:    216G
```

Figure 109. REPORT-31 Backed Up Dataset Detail By Date

The data presented is:

- Dataset Name
- Generation - this is the DFHSM generation number, not a generation data group level number.
- Primary Volume - the disk volume where the dataset resided before it was either backed up or migrated.
- Backup Date
- Backup Time
- Expiration Date
- Dataset Size
- SMS Management Class
- SMS Storage Class
- SMS Data Class

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HSM Optimizer Report Menu

DFHSM generates many statistics which are kept in SMF records and are not generally reported. Since tuning DFHSM can be critical to its successful operation, we have provided a series of reports which use these statistics, and will significantly reduce the tuning effort required for DFSMS, DFHSM, and the HSM Optimizer.

These reports will assist in setting and maintaining your ACS parameters in a DFSMS environment as well.

Reports are generated by selecting **4 HSM Reports** from the OS/EM Extended Functions menu. When you do so, a panel is displayed which presents you with three (3) options.

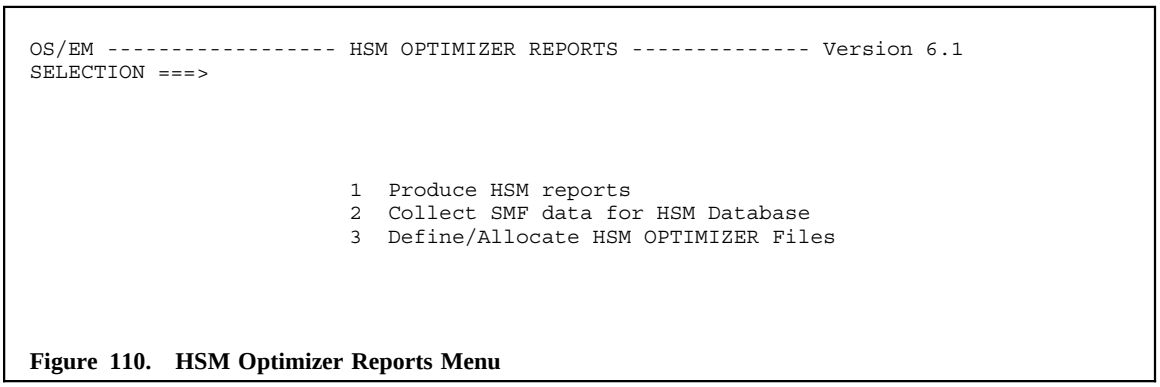

Figure 110. HSM Optimizer Reports Menu

Each of these paths is presented in the following sections:

1 Produce HSM Reports (see “Produce HSM Reports” on page 5-105)

2 Collect SMF Data (see “Collect SMF Data for HSM database” on page 5-107)

This option is used to load HSM data from a file containing the HSM SMF records into the HSM Report database. The database must already have been created by Option 3.

3 Define/Allocate HSM Optimizer Reports Files (see “Define/Allocate HSM Optimizer Files” on page 5-109)

This option is used to define a new HSM Optimizer Report database (either VSAM or QSAM); define the names of the HSM Migration Control Data Set (MCDS), the Backup Control Data Set (BCDS), and SMF record type being produced by DFHSM that is required for building the HSM database.

Each of these options results in a batch job being submitted which does the actual work. A panel allowing you to supply an appropriate JOB statement is presented just before the batch job is submitted.

Note: The JOBCARD information is stored in the user's profile.

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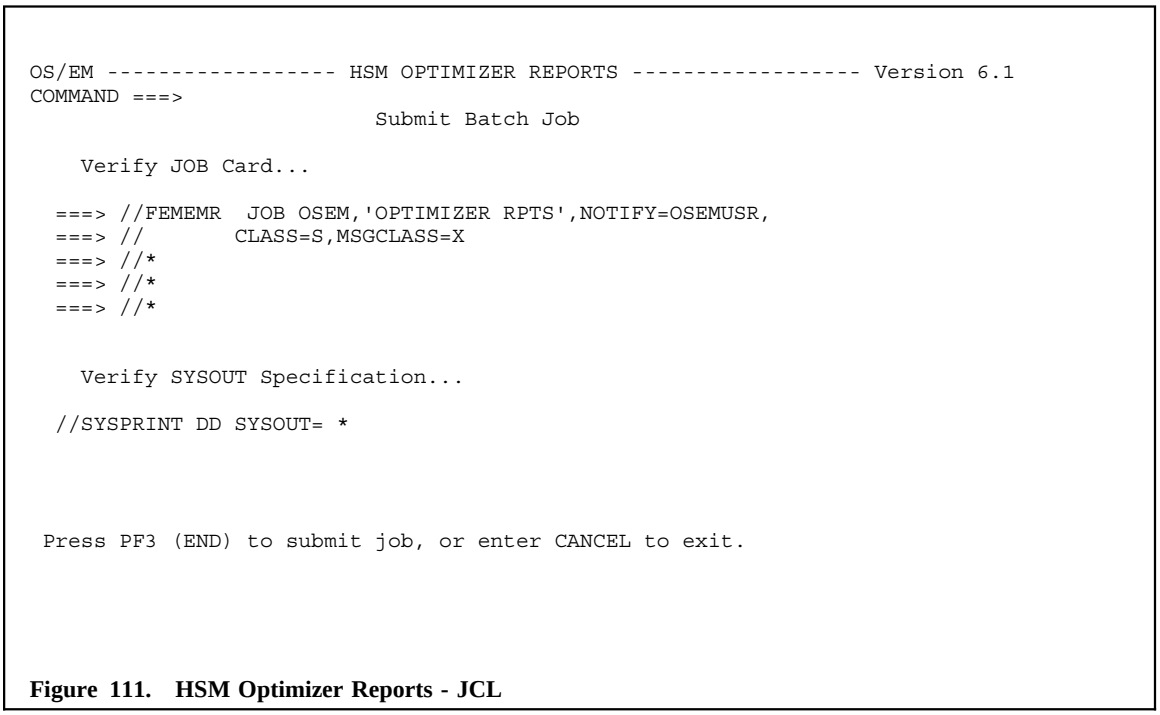

Figure 111. HSM Optimizer Reports - JCL

Field entry is as follows:

1. Verify JOB card

   Enter or update the information for the JOB statement to be used for the batch job which will be submitted.

2. Verify SYSOUT Specification

   Enter or update the SYSPRINT specification that will be used in the batch job which will be submitted.

   Report 00 (which contains control card images), report processing messages, sort messages and other utility messages are directed to SYSPRINT. Reports 1 to 32 are written to dynamically allocated DD statements where the DDNAME is the name of the report.

   Note: The print class used for reports 1 to 32 is taken from the SYSPRINT specification.

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Produce HSM Reports

Once the Define/Allocate (see “Define/Allocate HSM Optimizer Files” on page 5-109) and the Collect SMF Data (see “Collect SMF Data for HSM database” on page 5-107) steps have been completed, you may request reports. Thirty-one (31) reports are produced in sixteen (16) basic formats.

- Report 0 is basically a cover report indicating which reports have been requested within a report run. It is not selectable.

Reports are requested by selecting **4**, **HSM Reports**, from the OS/EM Extended Functions panel. The HSM Optimizer Reports panel (see Figure 112) lets you set the beginning and ending reporting dates, the beginning and ending dates for the MCDS and BCDS reports as well as the data movement index needed for report-17.

The entries you make determine the reports that are generated.

```
OS/EM ------------------ HSM OPTIMIZER REPORTS ------------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

                      Create Reports ===>  NO    (YES/NO)

 Optimizer Report Dates:  Begin: *M-1      End: *M        Use MM/DD/YY or
 MCDS Report Dates:       Begin: *M-1      End: *M        *M or *M-x or
 BCDS Report Dates:       Begin: *M-1      End: *M        *D or *D-x where x
                                                          is 1 to 999
 Dataset Movement Index for Report 17 ===>  0.100

SEL Selected     Report Description
 _    ___     01  Migration Detail        (Primary -> ML1)
 _    ___     02  Migration Delay Summary (Primary -> ML1)
 _    ___     03  Migration Age Summary   (Primary -> ML1)
 _    ___     04  Migration Detail        (ML1 -> ML2)
 _    ___     05  Migration Delay Summary (ML1 -> ML2)
 _    ___     06  Migration Age Summary   (ML1 -> ML2)
 _    ___     07  Migration Detail        (Primary -> ML2)
 _    ___     08  Migration Delay Summary (Primary -> ML2)
 _    ___     09  Migration Age Summary   (Primary -> ML2)
 _    ___     10  Recall Detail           (ML1 -> Primary)
 _    ___     11  Recall Delay Summary    (ML1 -> Primary)
 _    ___     12  Recall Age Summary      (ML1 -> Primary)
```

Figure 112. HSM Optimizer Reports - Select Reports

Field entry is as follows:

1. Beginning/Ending Report Dates

   The Report Beginning/Ending dates can be specified as MM/DD/YY, or optionally by using HSM Optimizer Reports' Dynamic Date specification the user can allow the HSM Optimizer Reports to select the records included on the report based on the current run date and a 'DELTA' specified from the current date.

   If the beginning Date for Reports is specified as '*M' and nothing is entered in the Ending Date for Reports then only records that match the current processing month will be included in the reports. Specifying '*M-1' in the Beginning Date for Reports includes all records from the month prior to the current processing date. Valid values are '*M' thru '*M-999' for both Beginning and Ending dates.

   If the Beginning Date for Reports is specified as '*D-1' the reports will include all records from the Day prior to the current processing date. Valid values are '*D' thru '*D-999' for both Beginning and Ending Report Dates.

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If the Report Beginning/Ending dates are specified as MM/DD/YY, the months, days, and years are coded as two digit numbers.

If neither a beginning nor ending date is specified, the report will contain only the last seven (7) days.

2. Dataset Movement Index for Report 17

   By specifying a Dataset Movement Index, only datasets that exceed that value will be included in the report. See “Report-17 PRIMARY DATASET ACTIVITY REPORT” on page 5-82.

The bottom portion of the panel is scrollable. It lists the 31 available reports in numerical sequence. This information is saved in the OS/EM ISPTLIB library and so is available to anyone selecting reports.

There are two available fields in this section of the panel, **SEL** and **Selected**. The SEL field acts as a toggle, in other words, if the report has not been selected, placing an **S** in the SEL column will change the Selected field to **YES**. If the report has already been selected, placing an S in the SEL column will change the Selected field to blanks.

Note: The RPTRPT member provided in the OS/EM SAMPLIB provides sample JCL for the create HSM Optimizer Reports function and is to be used as an example to create any batch jobs that you may require.

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Collect SMF Data for HSM database

The second step in report generation is to collect the appropriate SMF data. Three fields are required on the panel (see Figure 113): the HSM Database Retention Date, the HSM Report Database name and the SMF Input File Name.

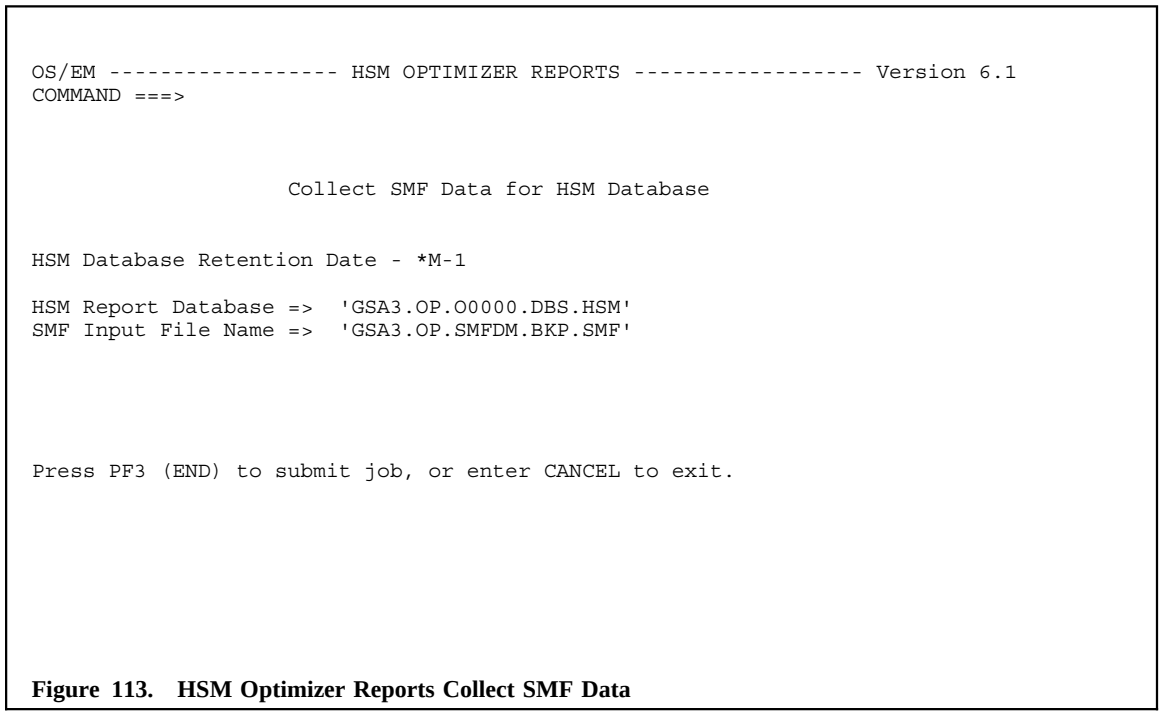

Figure 113. HSM Optimizer Reports Collect SMF Data

Field entry is as follows:

1. Retention Report Dates

   The Report Retention dates can be specified as MM/DD/YY, or optionally by using HSM Optimizer Reports' Dynamic Date specification the user can allow the HSM Optimizer Reports to retain the records included on the HSM Optimizer Reports database on the current run date and a 'DELTA' specified from the current date.

   If the Retention is specified as '*M' then only records that match the current processing month will be retained in the HSM Optimizer Reports database. Specifying '*M-1' in the retention Date for HSM Optimizer Reports database will retain the current and prior months data. Valid values are '*M' thru '*M-999' for the Retention date.

   If the Retention Date for is specified as '*D-1' the HSM Optimizer Reports database will retain the day prior to the current processing date. Valid values are '*D' thru '*D-999' for the retention date.

   If the Report Retention date is specified as MM/DD/YY the months, days, and years are coded as two digit numbers.

   Note: OS/EM recommends that the retention date be specified as at least '*M-2'. This retains the current month plus the two previous months on the HSM Optimizer Reports database. This is required for certain reports to function properly. i.e. Dataset Activity Report.

   If a Retention Date is not specified, the database will contain all records.

2. HSM Report Database Name

   Enter the name of the database created by “Define/Allocate HSM Optimizer Files” on page 5-109.

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3. SMF Input File Name

   The other required information is the name of the SMF file where your installation collects SMF data. This file must have a format produced by the IBM IFASMFDP program.

   Note: The IFASMFDP member provided in the OS/EM SAMPLIB provides sample JCL for the dump SMF files function and is to be used as an example to create any batch jobs that you may require.

The end result of using this panel will be a batch job which will read the specified SMF file and populate the HSM Optimizer Reports database with the requested records. Each time you use the panel, more data is collected, up to the specified retention. For a QSAM database, the effective retention is the number of generations you specified when defining the HSM Optimizer Reports database. For a VSAM database, records are added and updated, as necessary, to keep the database within the desired retention period. This will mean that the database should be reorganized when a catalog listing shows an excessive number of CI and CA splits.

Note: The RPTCOLL member provided in the OS/EM SAMPLIB provides sample JCL for the collect SMF data function and is to be used as an example to create any batch jobs that you may require.

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Define/Allocate HSM Optimizer Files

The HSM Optimizer files must be defined and allocated before any reports can be produced. The panel (see Figure 114) lets you specify these datasets.

```
OS/EM ------------------ HSM OPTIMIZER REPORTS ------------------ Version 6.1
COMMAND ===>
                  Allocate/Define HSM OPTIMIZER Files

               NO   - SUBMIT Job for Initialization

       V   - HSM Database (V=VSAM Q=QSAM)     234  - HSM SMF Record Type

  SMS505   - Volume to Place Database (Required for VSAM)
    3390   - Unit Parameter for Database (3380/3390/3420/3480/3490)

      05   - Number of Generations for QSAM Database (Required for QSAM)

 080000   - Number of Records for Primary Allocation (Required)
 020000   - Number of Records for Secondary Allocation (Required)
                                                                  UPDATE
                - Define HSM OPTIMIZER Datasets                   SPLIT
                                                                  DSNs
Report Database Name   -  'SYSX.OP.O0000.DBS.HSM'
HSM MCDS Dataset Name  -  'SYSX.HSM.MCDS'                          NO
HSM BCDS Dataset Name  -  'SYSX.HSM.BCDS'                          NO
Model DSCB for GDG Dsn -  'SYSX.GDG'
```

Figure 114. HSM Optimizer Reports - Define/Allocate Files

Field entry is as follows:

1. Submit Job for Initialization

   Enter **Y** to submit JOB for creating a VSAM cluster or defining the Generation Dataset Base definition for a QSAM file.

   Enter **N** to not submit a JOB.

2. HSM Optimizer Database

   Enter a **V** or **Q** to define a VSAM cluster or QSAM HSM Report Database.

   The HSM Optimizer database will be a QSAM or VSAM dataset. If you choose QSAM, you must specify:

   - whether the dataset will reside on DASD or tape
   - the number of QSAM datasets that will be retained
   - the number of records for the primary allocation and the number of records for the secondary allocation if you specify DASD for the database
   - the name of a Model DSCB to be used when the Generation Base definition is created.

   If you choose VSAM as the database organization, you must specify:

   - a DASD volume serial number
   - the number of records for the primary allocation and the number of records for the secondary allocation.

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The default number of records for primary and secondary allocation should be adequate for most installations.

Note: You must also specify the names of the DFHSM MCDS and BCDS datasets used in your installation. Information used in some of these reports is gathered from these datasets.

3. HSM SMF Record Type

   Enter the **DFHSM SMF** record number.

   Note: Refer to DFHSM ARCCMDxx member or your DFHSM Storage Administration Reference to determine the SMF record number selected for your installation.

4. Volume

   Enter the **volser** of the volume where the VSAM database is to be allocated.

5. Unit Type

   Enter the **unit type** where the HSM Report Database will be allocated.

6. Number of Generations

   Enter the **number of generations** required for QSAM database.

7. Primary Allocation

   Enter the **primary allocation** specified in number of records.

8. Secondary Allocation

   Enter the **secondary allocation** specified in number of records.

9. Report Database Name

   Enter a **dataset name** for the HSM Optimizer Report Database

10. MCDS Database Name

    Enter the **DFHSM Migration Control Data Set** (MCDS) dataset name.

11. BCDS Database Name

    Enter the **DFHSM Backup Control Data Set** (BCDS) dataset name.

    Note: If either your MCDS or BCDS datasets are split, enter **YES** in the **UPDATE SPLIT DSNs** field. This will present you with another panel to enter the dataset names.

12. Model DSCB for GDG Dataset Name

    Enter the name of a **Model DSCB** if you are allocating a QSAM HSM Optimizer Report database.

Once all the fields on the panel are complete to your satisfaction, ensure the SUBMIT Job for Initialization field is set to Y. The submitted job will either define the GDG Base Definition, or define a VSAM file.

Note: Refer to DFHSM ARCCMDxx member or your DFHSM Storage Administration Reference to determine the SMF record number selected for your installation.

Note: The RPTALLOC member provided in the OS/EM SAMPLIB provides sample JCL for the define HSM Optimizer Reports files function and is to be used as an example to create any batch jobs that you may require.

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ISPF File Prefix Controls

Description

The ISPF File Prefix Controls allow you to specify a specific prefix for ISPF **log**, **list**, and **temporary** dataset allocations.

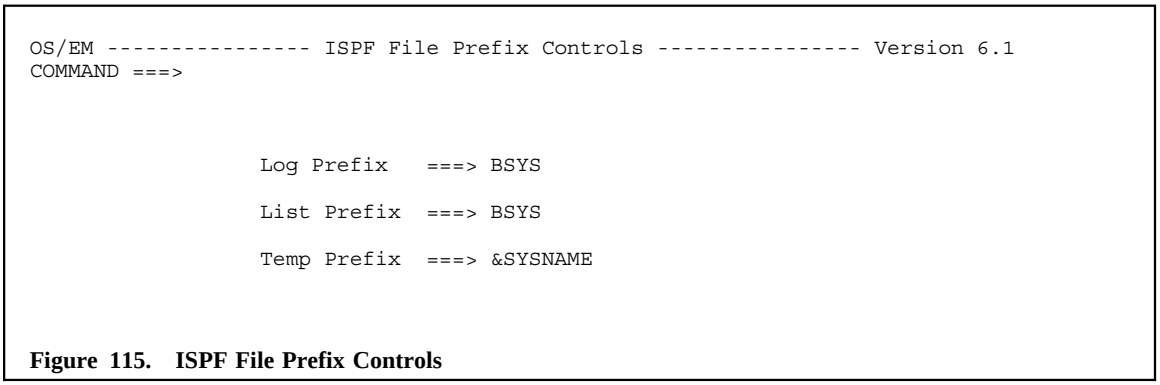

Figure 115. ISPF File Prefix Controls

Field entry is as follows:

- Log Prefix

  Enter the 1 to 8 character prefix to use in the LOG file allocation.

- List Prefix

  Enter the 1 to 8 character prefix to use in LIST file allocations.

- Temp Prefix

  Enter the 1 to 8 character prefix to use in TEMPORARY file allocations.

To disable the prefix for any of the above, simply blank out the field for the file type to be disabled.

System Symbolics may also be entered. If entered, they will be resolved prior to file allocation.

The dataset name constructed will be in the form:

```
userid.prefix.ISPF-specific-suffix
```

Where:

- userid

  The TSO ID of the user

- prefix

  The prefix entered via OS/EM

- ISPF-specific-suffix

  This is controlled by ISPF based on the type of file being allocated.

If this option is enabled by executing the change online it takes effect immediately for all users currently using ISPF and may cause ISPF system errors. Because of this it is suggested that the option only be enabled during an IPL when OS/EM will process the INIT members in the OSEM started task.

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System Requirements

OS/EM provides a version of ISPEXITS to allow it to dynamically load and delete any of the ISPF Installation Wide Exits. IBM provides a default module of this name and if your already run ISPF exits you will have your own version. You must ensure that ISPEXITS is **not** in a STEPLIB in any ISPF logon procedure, otherwise ISPEXITS will be loaded from the STEPLIB and not from the OS/EM load library. Any exit (and associated data area) coded in your ISPEXITS must be defined to OS/EM via the Basic Exit Functions.

In addition, if you have never activated the ISPF Installation Wide Exits, you must enable them by either coding the option on the ISPMTAIL macro or with the ISPCCONF command. See the ISPF Planning and Customizing manual section Tailoring ISPF Defaults for more information.

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JCL Controls

Description

JCL Controls allow installations to control various JCL parameters using an OS/EM table, or utilize an External Security Manager for checking whether Users have access to a particular resource.

Summary of Features

- Account Number controls allow Job Accounting Number(s) to be verified as valid and optionally resource checked, utilizing an External Security Manager to determine that a User has access to that Job Accounting Number
- Convert EZ-PROCLIB to JCLLIB
- JOBCLASS controls cause the External Security Manager to resource check a JOBCLASS for User access
- JOBNAME controls cause MVS Manager to determine if a JOBNAME has access to a JOBCLASS, and/or a certain JOBNAMES are excluded from a JOBCLASS
- Force Open Controls will perform an OPEN on all or selected datasets that are newly allocated by the job but are not opened. This facilitates the release of excess DASD space.
- Virtual Storage controls provide up to 32 different virtual storage controls for region, hiperspace and data space based on JOBCLASS, JOBNAME and Program Name
    - Region Below the line (16 Megabyte)
    - Getmain Below the line (16 Megabyte)
    - Region Above the line (16 Megabyte)
    - Getmain Above the line (16 Megabyte)
    - Memlimit above 2G bar
    - Hiperspace Default Size
    - Hiperspace Total Size
    - Hiperspace Total Spaces
- SYSOUT parameters
- Tape Usage by JOBCLASS specifying Maximum Total Tapes and/or Maximum by type of tape (e.g. 3420, 3480, 3490, VTS and 3590)
- Other JCL Controls
- STEPLIB Controls
- Security Interface to an External Security Manager (e.g. RACF, CA-TOPSECRET, CA-ACF2) to allow access to OS/EM functions

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JCL Control Menu

```
OS/EM ---------------------- JCL CONTROLS ---------------------- Version 6.1
COMMAND ===>

                    1  Account Number Controls           (JES2)
                    2  Convert EZ-Proclib(R) to JCLLIB   (JES2)
                    3  Jobclass/Jobname Controls
                    4  Force Open Controls
                    5  Other JCL Controls                (JES2)
                    6  Steplib Controls
                    7  Sysout Class/Parameters          (JES2)
                    8  Tape Usage Controls
                    9  Virtual Storage Controls

                   10  Specify JES subsystem name used by
                       above options (currently set to JES2)
```

Figure 116. JCL Controls for JES2

Each of these paths is presented in the following sections:

1. Account Number Controls (see “Account Number Controls” on page 5-115)
2. Convert EZ-Proclib(R) to JCLLIB (see “Convert EZ-Proclib(R) to JCLLIB” on page 5-118)
3. Jobclass/Jobname Controls (see “Jobclass/Jobname Controls” on page 5-119)
4. Force Open Controls (see “Force Open Controls” on page 5-125)
5. Other JCL Controls (see “Other JCL Controls” on page 5-127)
6. STEPLIB Controls (see “STEPLIB Controls” on page 5-131)
7. Sysout Class/Parameters (see “Sysout Class/Parameters” on page 5-135)
8. Tape Usage Controls (see “Tape Usage Controls” on page 5-139)
9. Virtual Storage Controls (see “Virtual Storage Controls” on page 5-140)
10. Specify JES2 Subsystem Name (see “Set JES2 Name” on page 8-1)

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Account Number Controls

```
OS/EM ----------------- ACCOUNT NUMBER CONTROLS ----------------- Version 6.1
COMMAND ===>


                            _  Account Field 1
                            _  Account Field 2
                            _  Account Field 3
                            _  Account Field 4
                            _  Account Field 5
                            _  Account Field 6

   Apply Account Number Controls to TSO Users? ===> YES   (Yes/No)
```

Figure 117. Account Number Controls

Account Number Controls allows you to control whether a job will be allowed to execute based upon the values entered in the Job accounting field of the job card or the step execute card.

OS/EM supports up to six sub-parameter Job accounting fields (ACCT1 to ACCT6). To set accounting field control attributes, enter a non-blank character next to the desired account field. The account control edit panel will be displayed (see Figure 118).

If you want the account number controls to validate TSO users at logon time, enter **YES** in the 'Apply Account Number Controls to TSO Users?' field.

```
OS/EM ------------------------ JCL CONTROLS: ACCT1 ------------- Version 6.1
Command ===>                                                 Scroll ===> CSR

   ACCT1 checking is active       ===> YES             (Yes/No)

   ACCT1 values listed below
      or defined to security      ===> CHECK           (Allow/Disallow/Check)
   ACCT1 undefined to security    ===> DISALLOW        (Allow/Disallow)
   Other ACCT1 values             ===> CHECK           (Allow/Disallow/Check)
   ACCT1 format                   ===> CHAR            (CHAR/Numeric)

   Optional security
   Class ===> ________   Resource ==> ____________________________________________

 (CMD = (I)nsert (D)elete (S)elect)
  CMD   ACCT1 / Description
   '    SP$XXX
        SYSTEMS PROGRAMMING ACCOUNT
****************************** Bottom of data ********************************
```

Figure 118. JCL Controls: ACCT1

Field entry is as follows:

1. Account checking active

   Enter **YES** to activate accounting field checking.

   Enter **NO** to deactivate accounting field checking.

2. ACCTx values listed or defined to security

   If you have entered values in the scrollable portion of this panel you may **allow** their use, **disallow** their use, or **security check** the values.

   This field is the **controlling keyword** for this function. If you enter **ALLOW** or **DISALLOW**, you **must** enter items in the scrollable section of this panel, as those will be the items which are to be allowed or disallowed.

   If you have specified **ALLOW**, then the accounting field from the job being checked will be compared to the listed items. If the value is not found, then the **other** values field will determine if the value is allowed. See the **other values** field below for determining the action to be taken if the value is not found.

   If you have specified **DISALLOW**, then the accounting field from the job being checked will be compared to the listed items. If the value is listed, then the account number is disallowed, and the job will receive a JCL error. If the account number is not listed, then the **other** values field will determine if the value is allowed. See the **other values** field below for determining the action to be taken.

   If you have specified **CHECK** and you have listed items in the scrollable portion of the panel, then the accounting field will be compared to those items. If a match is found, then the external security manager is checked to determine if the user submitting the job has access to the value listed.

   If this value is not defined to your security manager, then the **undefined to security** field will determine the action to be taken.

   If this value is not defined in the list, then the **other** values field determines if the value is allowed.

   If you enter **CHECK** and **do not** enter any items in the scrollable portion of the panel, then all accounting field values will be checked against the external security manager and the **undefined to security** field will determine the action to be taken if the resource is not defined.

3. Account number undefined to security

   If you have specified **CHECK** as the controlling keyword, any values that have not been defined to the external security manager will either be allowed or disallowed based on your entry here.

   This entry is ignored if the controlling keyword is ALLOW or DISALLOW.

4. Other Account values

   This field specifies the action to be taken whenever a parameter is not found in the list of values displayed in the scrollable portion of the panel.

   Specifying **ALLOW** means that any parameter which was not found in the list of values will be allowed.

   DISALLOW specifies that the parameter which was not found in the list will be disallowed and the job will fail with a JCL error.

   Specifying **CHECK** will cause the parameter not found in the list to be checked via the external security manager.

5. Account Number Format

   Enter either CHAR or NUMERIC to control how the account number is validated. If NUMERIC is specified, then leading zeros are dropped, whereas CHAR specifies that each character must match exactly.

6. Optional security

   This defines the security profile to be used when CHECK is specified.

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Class The general resource class to be used.

Resource The resource name prefix. The value of general resouce class and, optionally, the resource name. The value of the ACCTx field will be appended to the value in the Resource field.

For example, if the Resource field is set to ACCOUNT1, then the profile that will be checked is ACCOUNT1.value

Notes:

- The Class name must be specified if a Resource name is defined. The class can be any valid general resource class. Do not specify DATASET.
- If the Resource field is left blank, the profile to be checked will be the value of the ACCTx field.
- If both fields are blank, the default resource will be checked - JCL.ACCTx.value in the FACILITY class (IBMFAC for CA-TOPSECRET).
- READ access is required for the resource in order to be able to use the secured ACCTx value.

7. CMD

   To list specific data, use the scrollable portion of the panel. To insert a blank line, enter **I** in the CMD field.

   To delete a line, enter a **D** in the CMD field for the line to be deleted.

   To update a line, enter an **S** in the CMD field and overtype the information to be changed.

8. ACCT#

   Enter the accounting value(s) and/or value mask(s) to be allowed, disallowed or checked by external security.

   See “Appendix B. General Masking” on page B-1 for information about field masking.

9. Description

   Enter any descriptive text (optional).

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Convert EZ-Proclib(R) to JCLLIB

This control will cause OS/EM to convert any **EZ-Proclib(R)** statements to normal IBM **JCLLIB** statements.

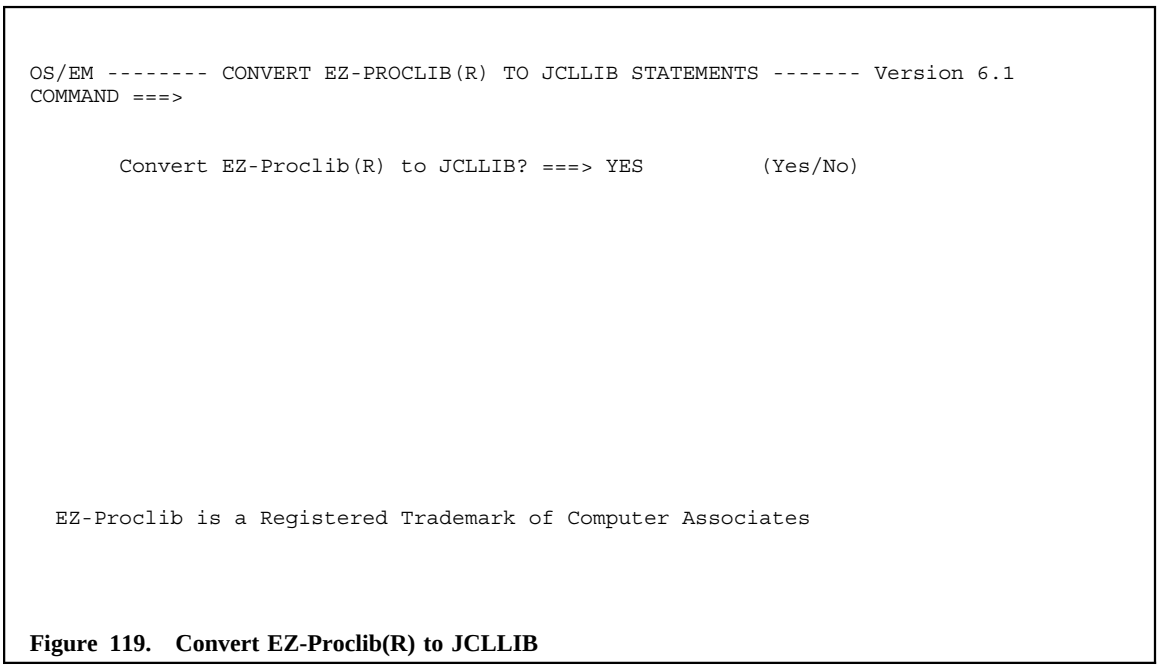

Figure 119. Convert EZ-Proclib(R) to JCLLIB

To enable conversion, enter **YES**. To leave these statements alone, enter **NO**.

Any //PROCLIB DD statements, including concatenations, are commented out and replaced by //PROCLIB JCLLIB ORDER= statements.

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Jobclass/Jobname Controls

Wherever possible, OS/EM optional functions are applied on a job class basis. This means that your installation should have a well-defined set of rules for job class usage. Any rules you develop should account for the following:

- If you run CICS (or any other transaction processing system) as a batch job, you should have separate production and test classes. Typically, the production class(es) will have a higher dispatching priority than almost anything else in the system. The test class(es) will be much lower (give thought to placing these classes at a lower priority than TSO. If these test systems hang, they can lock out your TSO users).

- If you are going to control tape usage for test jobs, you need enough classes defined to handle the various allocation rules you develop. You probably will want to tie job turnaround time to the number of tape devices the job uses. That is, a quick turnaround job such as a compile would normally not require any tape devices. A job that requires three or more tape devices could be given a long turnaround time.

- The number of production job classes should be held to a minimum. It is not the number of job classes that determines how many production jobs can run, but the number of initiators these classes are assigned to.

- However, you should have at least one class reserved for those production jobs that consume excessive resources and single-thread such jobs through this class. We would also recommend that you reserve one production class for those jobs that absolutely need to be executed when they are submitted. Such jobs would be the SMF dump job; and, if your CICS journal is on disk, the job that dumps a full disk journal to tape.

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```
OS/EM ---------------- JOBCLASS/JOBNAME CONTROLS ---------------- Version 6.1
COMMAND ===>

                     1  Enable/Disable Job Class Checking
                     2  Enable/Disable Job Name Checking
```

Figure 120. Jobclass/Jobname Controls

1. Enable/Disable Job Class Checking (See “Job Class checking” on page 5-121)
2. Enable/Disable Job Name Checking (See “Job Name Checking” on page 5-122)

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Job Class checking: This function uses your external security package (RACF, CA-ACF2 or CA-TOPSECRET) to verify user's ability to use a particular jobclass either at submission time, execution time or both.

```
OS/EM --------------------- JOB CLASS CHECK --------------------- Version 6.1
COMMAND ===>


               Job Class Checking is active at:

                   Submit time    ===> YES      (YES/NO)
                     RACF Logging ===> NORMAL   (NONE/NORMAL)

                   Execution time ===> YES      (YES/NO)
                     RACF Logging ===> NONE     (NONE/NORMAL)
```

Figure 121. Job Class Check

Field entry is as follows:

1. Submit time

   Entering **YES** specifies that a check be done to ensure that the user is authorized to submit a job in the jobclass used.

   Entering **NO** disables this option.

2. RACF Logging

   Entering **NORMAL** means that RACF will do normal logging for this check. **NONE** says no RACF logging will be requested.

3. Execution time

   Entering **YES** specifies that a check is done when the job is selected for execution to be sure that the user is authorized to execute a job in the jobclass used.

   Entering **NO** disables this option.

4. RACF Logging

   Same as **2** above.

The command authorization is done by using classname FACILITY for RACF and CA-ACF2, and classname IBMFAC or DATASET for CA-TOPSECRET. The resource name is JOBCLASS.x where 'x' is the desired jobclass. Each jobclass must be properly defined to your security system.

Note: Jobclass resources that are not defined to the External Security system are always allowed.

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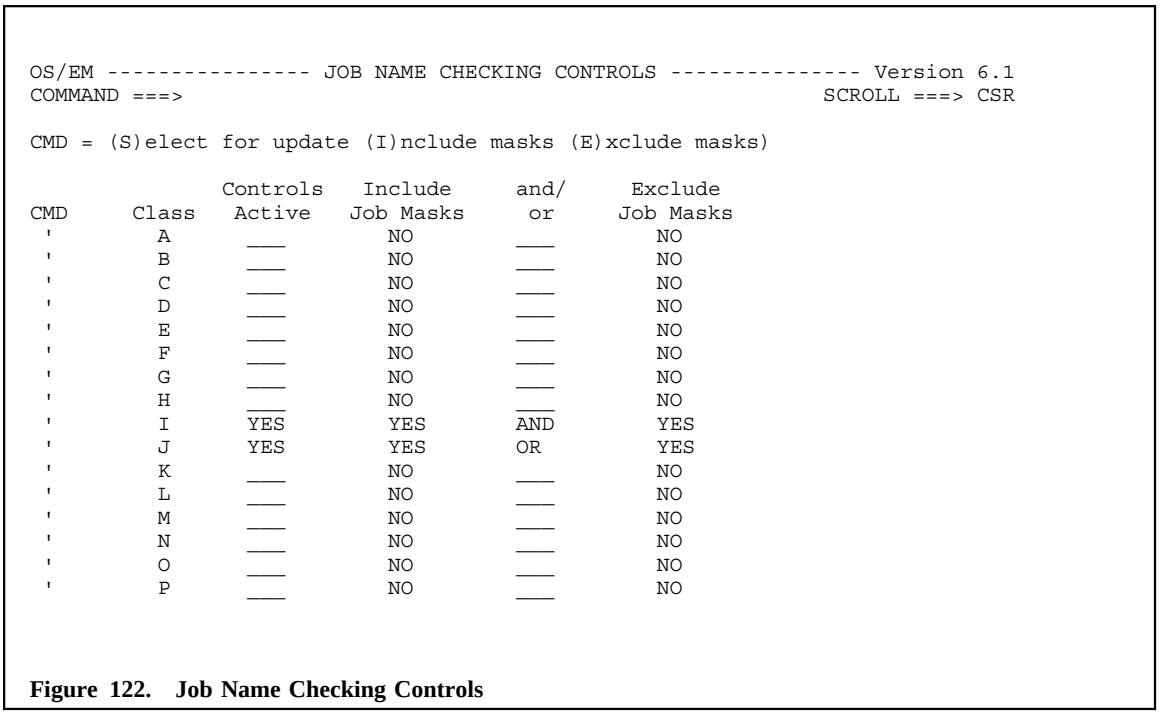
Job Name Checking: This function allows you to control which jobs can execute within a given jobclass. Using job name masks, you can specify that only jobs which match a mask can execute and/or exclude jobs which match a mask.

When you select Job Name Checking Controls, you are presented a scrollable list of job classes.



```
OS/EM ---------------- JOB NAME CHECKING CONTROLS --------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

CMD = (S)elect for update (I)nclude masks (E)xclude masks)

                Controls   Include     and/     Exclude
CMD     Class   Active   Job Masks     or     Job Masks
 '        A       ___        NO        ___        NO
 '        B       ___        NO        ___        NO
 '        C       ___        NO        ___        NO
 '        D       ___        NO        ___        NO
 '        E       ___        NO        ___        NO
 '        F       ___        NO        ___        NO
 '        G       ___        NO        ___        NO
 '        H       ___        NO        ___        NO
 '        I       YES        YES       AND        YES
 '        J       YES        YES       OR         YES
 '        K       ___        NO        ___        NO
 '        L       ___        NO        ___        NO
 '        M       ___        NO        ___        NO
 '        N       ___        NO        ___        NO
 '        O       ___        NO        ___        NO
 '        P       ___        NO        ___        NO
```

Figure 122. Job Name Checking Controls

Field entry is as follows:

1. CMD

   To activate a class, enter an **S** in the CMD field for that class, and enter **YES** in the Controls Active column.

2. Controls Active

   Entering **YES** in this field will enable OS/EM's extended processing.

   Entering **NO** in this field will disable OS/EM's extended processing.

   This field must be completed before you will be allowed to leave this panel.

3. INCLUDE

   To create a list of INCLUDE job masks, enter an **I** in the CMD field and press enter. You will be presented with a POPUP panel showing all of the masks previously entered.

   Jobs matching an include mask are permitted to execute in the class specified.

4. AND/OR

   Connective between include masks and exclude masks. If you specify **AND** then the job being submitted must match an include mask **and** must **not** match an exclude mask. If you specify **OR** then the job being submitted may either match an include mask **or not** match an exclude mask.

5. EXCLUDE

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To create a list of EXCLUDE job masks, enter an **E** in the CMD field and press enter. You will be presented with a POPUP panel showing all of the masks previously entered.

Jobs matching an exclude mask are not permitted to execute in the specified class.

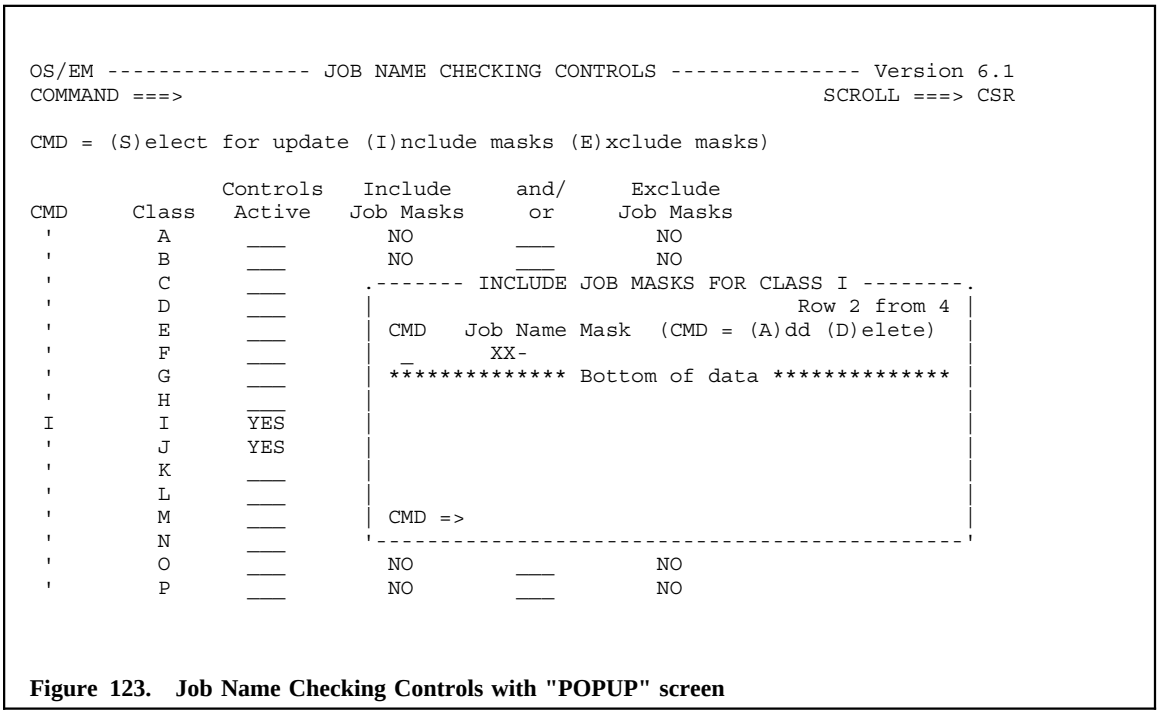

Figure 123. Job Name Checking Controls with "POPUP" screen

Field entry is as follows:

1. To add a mask, enter an **A** in the CMD field and overtype the Job Name Mask field.
2. To delete a mask, enter a **D** in the CMD field.

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Include / Exclude

Job Name Masks: The following table shows the allowable mask characters:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

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Force Open Controls

The Force Open Controls function ensures that allocated datasets are opened prior to the completion of a job. OS/EM will force an open for any dataset that is allocated but not opened, thus allowing excess storage to be released. The forced open will occur at the completion of the last job step that references the dataset.

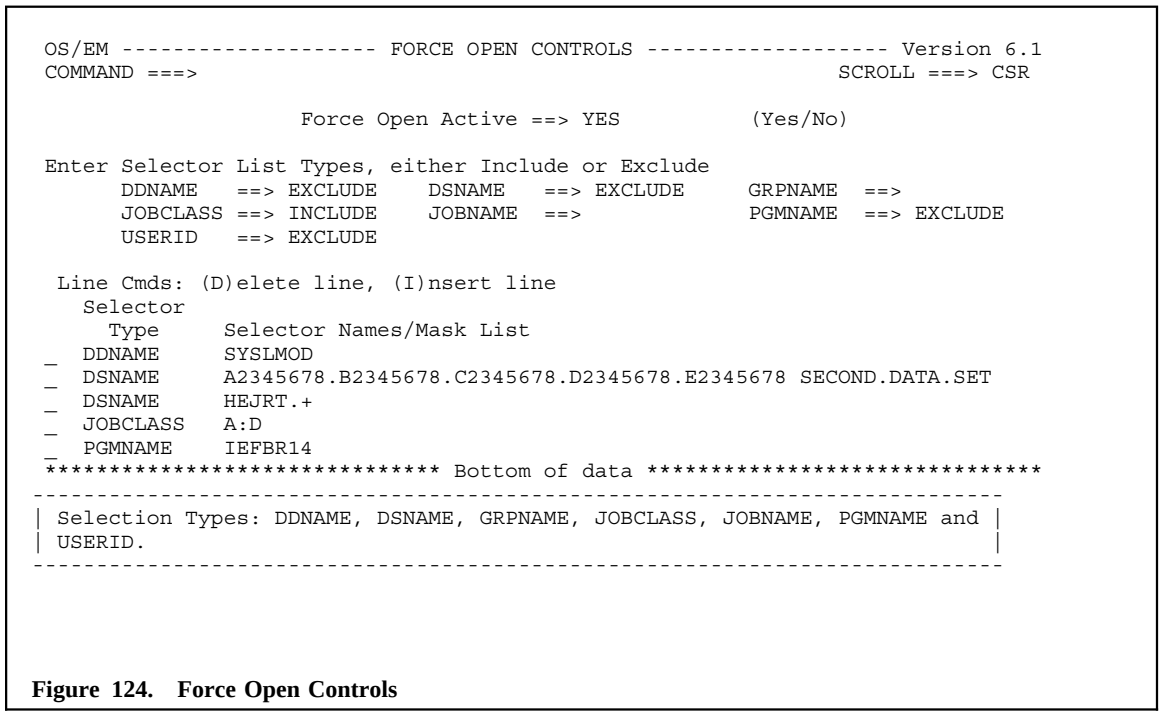

Figure 124. Force Open Controls

Field entry is as follows:

1. Force Open Active

   Enter **YES** to activate Force Open Controls

   Enter **NO** to deactivate Force Open Controls

2. Selector List Types

   The scope of the Force Open Controls can be limited to jobs that have specific attributes. This is controlled by **INCLUDE** and **EXCLUDE** lists:

   - **INCLUDE -** Only jobs that match the specification list will be controlled by the Force Open Controls.
   - **EXCLUDE -** All jobs except those that match the specification list will be controlled by the Force Open Controls.

   The following job attributes can control Force Open Controls through the INCLUDE and EXCLUDE lists:

   DDNAME Specifies the DDNAMEs to be included / excluded for Force Open Controls. If no DDNAME include / exclude list is provided then all DDNAMEs will be eligible for this function.

   DSNAME Specifies the dataset names to be included / excluded for Force Open Controls. If no DSNAME include / exclude list is provided then all datasets will be eligible for this function.

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JOBCLASS Specifies the job classes to be included / excluded for Force Open Controls. If no JOBCLASS include / exclude list is provided then all classes, TSO users and started tasks will be eligible for this function. Valid classes are A-Z, 0-9, TSU and STC. A contiguous range of classes can be specified with a colon (e.g. A:J).

JOBNAME Specifies the job names to be included / excluded for Force Open Controls. If no JOBNAME include / exclude list is provided then all job names will be eligible for this function.

PGMNAME Specifies the program names to be included / excluded for Force Open Controls. If no PGMNAME include / exclude list is provided then all programs will be eligible for this function.

USERID Specifies the user names to be included / excluded for Force Open Controls. If no USERID include / exclude list is provided then all users will be eligible for this function.

3. Selector Names/Mask List

   There must be one or more selector list entries for every Selector List Type that has an INCLUDE/EXCLUDE specification. These entries can be created and edited by simply entering the appropriate data into the Selector Type and Selector Names/Mask List fields.

   Selector line items can be inserted and deleted by entering **I** and **D** respectively in the line command field (the first input field of the Selector List detail line).

Defining INCLUDE / EXCLUDE lists

The Selector Names/Mask List field must contain at least one selector value. Multiple values are separated by a blank. With the exception of the JOBCLASS selector, values can be specified as a mask. See "Appendix B. General Masking" on page B-1 and "Dataset name masks" on page C-1 for information regarding value masking.

Multiple Selector Names/Mask detail lines can be defined for a particular Selector Type.

The Selector Names/Mask values are processed in the following way in order to determine Forced Open Controls eligibility:

- Multiple values for a particular Selector Type are processed as an **OR** list.
- Multiple Selector Types are processed as an **AND** list

Usage Notes:

- Datasets that are allocated through dynamic allocation will only be processed by Force Open Controls if the dataset remains allocated at the end of job. This is because OS/EM cannot determine the last job step that will use the dataset. If a dynamically allocated dataset is deallocated without an open, the allocated space will not be freed.

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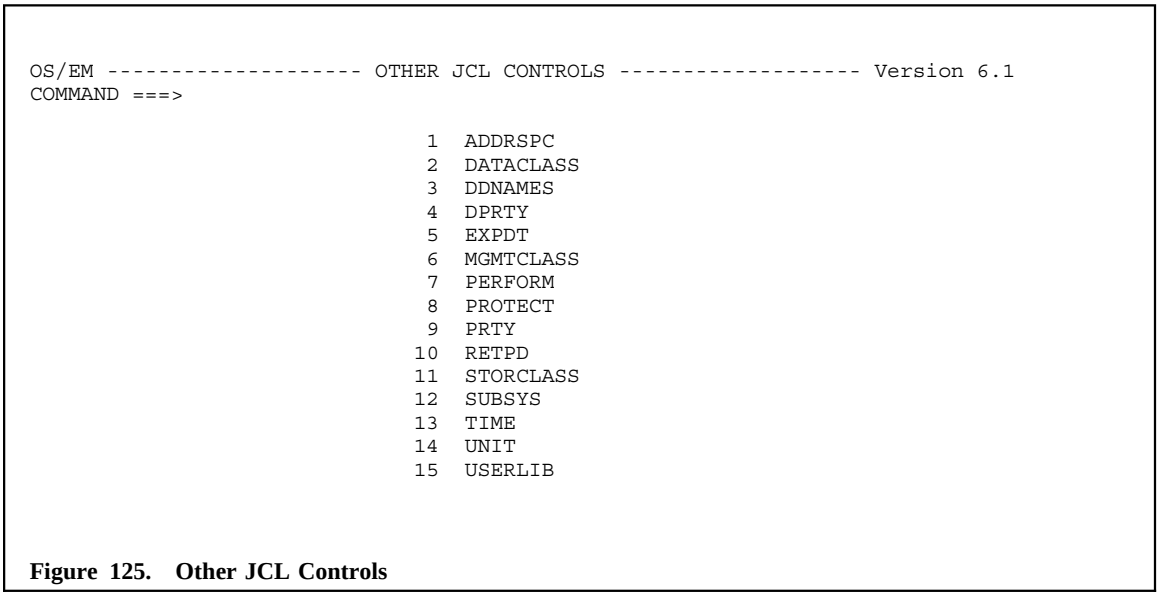

Figure 125. Other JCL Controls

When a selection is made, the next panel will reflect your choice and the verbiage on the panel will also reflect your choice. In Figure 126 on page 5-128, the choice was number 3 and the verbiage reflects DDNAMES. The same panel will appear for the other choices, but the verbiage will be different.

The following parameters are available:

Parameter	*Description*
ADDRSPC	Type of address space required
DATACLASS	DFSMS data class
DDNAMES	Data definition names
DPRTY	Dispatching priority
EXPDT	Expiration Date
	The EXPDT is normalized to the date format YYYY/DDD before checking.
MGMTCLASS	DFSMS management class
PERFORM	Performance group
PROTECT	Request RACF protection of a dataset
PRTY	Job selection priority
RETPD	Retention Period
STORCLASS	DFSMS storage class
SUBSYS	Subsystem which will process a dataset
TIME	Specify maximum step execution time
	The only available time parameters are: **MAXIMUM**, **1440**, **NOLIMIT**, and **HIGH**. The value **HIGH** is compared to the time parameter coded in JES PARMS for the ex-

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ecuting job class. If the value coded in the JCL for a step is greater than that specified by JES2 the user needs **READ** access for **CHECK**.

UNIT Storage device type

USERLIB OUTPUT statement for AFP libraries.

The same panel is displayed for all of the above parameters. The following example shows the definitions for the DDNAME parameter.

```
OS/EM ------------------ JCL CONTROLS: DDNAME ------------------- Version 6.1
Command ===>                                                 Scroll ===> CSR

   DDNAME checking is active       ===> YES             (Yes/No)

   DDNAME values listed below
      or defined to security       ===> CHECK           (Allow/Disallow/Check)
   DDNAME undefined to security    ===> DISALLOW        (Allow/Disallow)
   Unlisted DDNAME values          ===> ALLOW           (Allow/Disallow/Check)

   Optional security
   Class ===> ________   Resource ===> ____________________________________________

 (CMD = (I)nsert (D)elete (S)elect)
  CMD   DDNAME / Description
   '    JOBCAT
        MAKE SURE USER IS ALLOWED TO USE JOBCAT
   '    STEPCAT
        MAKE SURE USER IS ALLOWED TO USE STEPCAT
****************************** Bottom of data ********************************
```

Figure 126. JCL Controls: DDNAME

Field entry is as follows:

1. DDNAME checking active

   Enter **YES** to activate DDNAME checking.

   Enter **NO** to deactivate DDNAME field checking.

2. Listed DDNAME values or defined to security

   If you have entered values in the scrollable portion of this panel you may **allow** their use, **disallow** use, or **security check** the value.

   This field is the **controlling keyword** for this function. If you enter **ALLOW** or **DISALLOW**, you **must** enter items in the scrollable section of this panel, as those will be the items which are to be allowed or disallowed.

   If you have specified **ALLOW**, then the JCL parameter from the job being checked will be compared to the listed items. If the value is not found, then the **Unlisted values** field will determine if the value is allowed. See the **Unlisted values** field below for determining the action to be taken if the value is not found.

   If you have specified **DISALLOW**, then the JCL parameter from the job being checked will be compared to the listed items. If the value is listed, then the parameter is disallowed, and the job will receive a JCL error. If the parameter is not listed, then the **Unlisted values** field will determine if the value is allowed. See the **Unlisted values** field below for determining the action to be taken if the parameter is not found.

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If you have specified **CHECK**, and you have listed items in the scrollable portion of the panel, then the JCL parameter will be compared to those items. If a match is found, then the external security manager is checked to determine if the user submitting the job has access to the value listed.

If this value is not defined to your security system, then the **undefined to security** field will determine the action to be taken.

If this value is not defined in the list, then the **Unlisted values** field determines if the value is allowed.

If you enter **CHECK** and do not enter any items in the scrollable portion of the panel, all values will be checked against the external security manager. If the value is not defined to security then the **undefined to security** field will determine the action to be taken.

3. Parameter undefined to security

   If you have specified **CHECK** as the controlling keyword, any values which have not been defined to the external security manager will either be allowed or disallowed based on your entry here.

   This entry is ignored if the controlling keyword is ALLOW or DISALLOW.

4. Unlisted DDNAME values

   This field specifies the action to be taken whenever a parameter is not found in the list of values displayed in the scrollable portion of the panel.

   Specifying **ALLOW** means that any parameter which was not found in the list of values will be allowed.

   DISALLOW specifies that the parameter which was not found in the list will be disallowed and the job will fail with a JCL error.

   Specifying **CHECK** will cause the parameter not found in the list to be checked via the external security manager.

5. Optional security

   This defines the security profile to be used when CHECK is specified.

   Class The general resource class to be used.

   Resource The resource name prefix. The value of general resouce class and, optionally, the resource name. The value of the DDNAME field will be appended to the value in the Resource field.

   For example, if the Resource field is set to DDNAMES, then the profile that will be checked is DDNAMES.value

   Notes:

   - The Class name must be specified if a Resource name is defined. The class can be any valid general resource class. Do not specify DATASET.
   - If the Resource field is left blank, the profile to be checked will be the value of the parameter field.
   - If both fields are blank, the default resource will be checked - JCL.parm.value in the FACILITY class (IBMFAC for CA-TOPSECRET). See “JCL & SYSOUT Parameter Checking” on page J-2 for a list of the default resource names.
   - READ access is required for the resource in order to be able to use the secured parameter value.

6. CMD

   To list specific data, use the scrollable portion of the panel. To insert a blank line, enter **I** in the CMD field.

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To delete a line, enter a **D** in the CMD field for the line to be deleted.

To update a line, enter an **S** in the CMD field and overtype the information to be changed.

7. DDNAME

   Enter the DDNAME(s) and/or DDNAME mask(s) that are to be allowed, disallowed or checked with external security.

   See “Appendix B. General Masking” on page B-1 for information about general field masking and “Dataset name masks” on page C-1 for dataset name masking.

The example in Figure 126 on page 5-128 uses external security to control the use of the JOBCAT & STEPCAT DDNAME. The job will be terminated with a JCL error if the job has a JOBCAT or STEPCAT DD and (1) the user does not have READ access authority to the JOBCAT / STEPCAT resource, or (2) if the JOBCAT / STEPCAT resource is not defined to security. In this example, the default resource class and profile names will be used (i.e. JCL.DDNAME.JOBCAT & JCL.DDNAME.STEPCAT in the FACILITY class).

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STEPLIB Controls

Description: The STEPLIB option allows you to modify or replace existing STEPLIB DD statements or add a new STEPLIB DD based on job class, job name, user ID, step name or program name. You may optionally fail the job if any of the specified libraries for the STEPLIB are unavailable, or you may allow the job to continue without changing the existing STEPLIBs.

STEPLIB Controls Menu

```
OS/EM --------------------- STEPLIB CONTROLS -------------------- Version 6.1
SELECTION ===>


                       1  System Level Controls
                       2  Selection Lists
```

Figure 127. STEPLIB Controls Menu

This menu contains entries to update system level control information and the selection lists. Both entries must be selected to initially setup STEPLIB Controls.

System Level Controls

```
OS/EM ----------------- STEPLIB SYSTEM CONTROLS ----------------- Version 6.1
Command ===>                                                 Scroll ===> CSR


           Steplibs Active     ===> YES     (Yes/No)

           Wait Options:
             Dataset           ===> YES     (Yes/No)
             Volume            ===> NO      (Yes/No)
             Unit              ===> NO      (Yes/No)

           Allow HSM Recalls?  ===> NO      (Yes/No)
```

Figure 128. System Level Controls Panel

Use this panel to enter non-specific information about STEPLIB Controls. The information on this panel is required before any controls dealing with specific STEPLIBs becomes effective.

Field entry is as follows:

1. STEPLIBs Active

   Enter **YES** to turn on STEPLIBs, or **NO** to disable STEPLIBs on the current system.

2. Wait Options:

   The following Wait Options refer to the datasets specified as STEPLIB entities.

   - Dataset

Enter **YES** to allow the system to put the job into a wait state until the dataset is available. Enter **NO** to disable the wait. If **NO** is entered, the STEPLIB will not be processed and the **FAIL JOB** option specified on the selection lists panel will take effect.

- Volume

  Enter **YES** to allow the system to put the job into a wait state until the volume is available. Enter **NO** to disable the wait. If **NO** is entered, the STEPLIB will not be processed and the **FAIL JOB** option specified on the selection lists panel will take effect.

- Unit

  Enter **YES** to allow the system to put the job into a wait state until the unit is available. Enter **NO** to disable the wait. If **NO** is entered, the STEPLIB will not be processed and the **FAIL JOB** option specified on the selection lists panel will take effect.

3. Allow HSM Recalls

   Enter **YES** to allow the DFHSM recall to be processed. Enter **NO** to disable DFHSM recalls. If you disable recalls, the STEPLIB will not be processed and the **FAIL JOB** option specified on the selection lists panel will take effect.

Selection Lists: Up to 32 different sets of libraries and the selection criteria needed for each to be selected may be specified on this panel. You also state by selection group whether the job will fail (via a jcl error) if a specified library is unavailable, or if the job will continue without the STEPLIB being modified, replaced or added.

```
OS/EM ---------------------- STEPLIB CONTROLS -------------------- Version 6.1
Command ===>                                                 Scroll ===> CSR


Line Commands: (S)election Lists, (D)elete Lists
                                                          Active Lists
                  Placement           Fail Job     Job   Job  User Step
SEL  Num  Active          Description              Class Name  ID  Name Program
 '   01    Y      REPLACE             YES           EXC        INC
                  Vendor Product_________________
 '   02    Y      AFTER               NO            INC  INC   INC  INC   INC
                  Book Manager___________________
 '   03    N      BEFORE              NO            INC
                  _____________________________
 '   04    N      ________            ___
                  _____________________________
 '   05    N      ________            ___
                  _____________________________
 '   06    N      ________            ___
                  _____________________________
 '   07    N      ________            ___
                  _____________________________
 '   08    N      ________            ___
```

Figure 129. Selection Lists Panel

Field entry is as follows:

1. Active

   To activate a selection group, use the tab key to place the cursor in the **Active** column and enter a **Y**.

2. Placement

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Tab to the **Placement** field and enter where you want the dynamic STEPLIB libraries placed. Valid entries are:

- REPLACE

  Completely replace any existing STEPLIB DDs already in the JCL.

- BEFORE

  Add the dynamic libraries before any libraries specified in the JCL.

- AFTER

  Add the dynamic libraries after any libraries specified in the JCL.

3. Fail Job

   Tab to the **Fail Job** field and enter either **YES** or **NO**. This value determines whether the job will fail with a JCL error if any of the dynamic STEPLIB libraries are unable to be allocated. If it is acceptable that the job execute without the dynamic libraries enter **NO** here.

4. Description

   You may also enter an optional description line to describe what these dynamic libraries are for.

There are 2 line commands available. Use **S** to modify the selection lists or **D** to delete the selection lists.

The **S**elect line command allows you to specify the dynamic library names, enter the selection criteria based on job class, job name, user ID, step name or program name. Masks are acceptable for all but job class and the steplib dataset name.

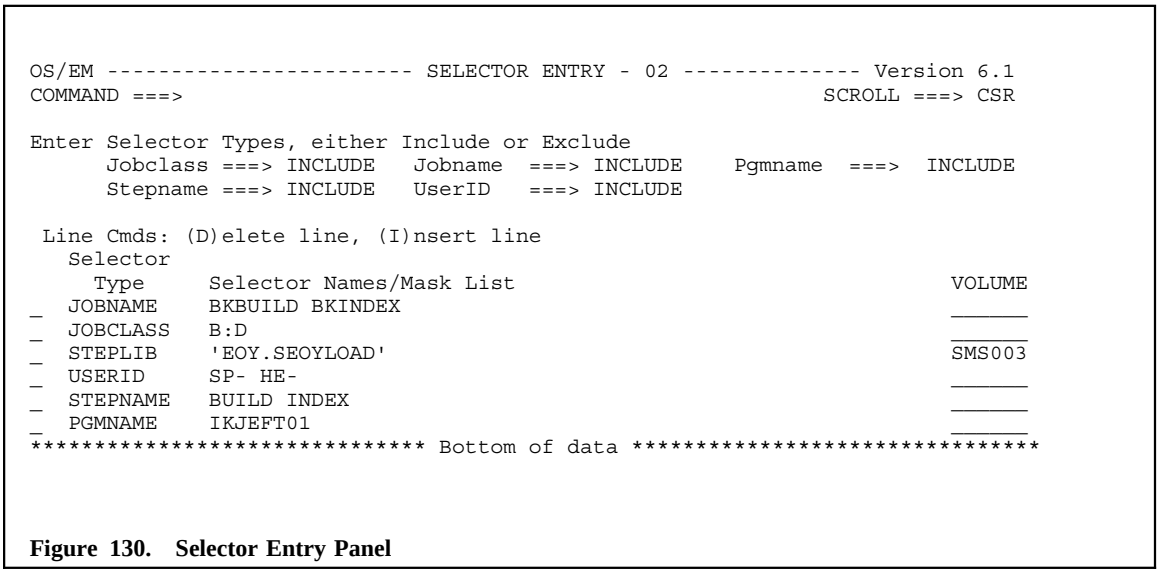

Figure 130. Selector Entry Panel

This panel allows you to specify the dataset names to be used for the **STEPLIB** as well as the selector types used to match this selector group to the job being checked.

Each **selector type** may be either an **INCLUDE** or **EXCLUDE** list. Types marked as **include** lists have to match the attributes of the job being checked. Types marked as **exclude** lists may **not** match the jobs attributes.

If you fail to specify either include or exclude, the list will be forced to an **include** type list.

In the scrollable portion of the panel, you enter the **selector types** and the names or masks for that type. With the exception of the **STEPLIB** type, you may enter as many names/masks that will fit on the line.

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If you have more entries than will fit on a line, simply insert a blank line and mark it to be the same **selector type** and continue entering names/masks. Selector types are **JOBCLASS, JOBNAME, PGMNAME, STEPNAME** and **USERID**.

The **JOBCLASS** entries may be listed individually or as a range. A range is entered as two classes separated by a colon (:), i.e. F:K.

The **STEPLIB** selector type is actually the dataset name of the library or libraries which will be used for the STEPLIB. A **volume** may be specified for datasets which are not cataloged (non-SMS) or to force use of a dataset on a different volume than that which is contained in the catalog. Only one dataset name may be specified per entry. If multiple dataset names are entered they will be concatenated in the order entered.

Any library entered here must currently exist. Standard TSO naming conventions are used, i.e. if **prefix** is turned on, any name entered without apostrophes will have your TSO ID added as the prefix.

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Sysout Class/Parameters

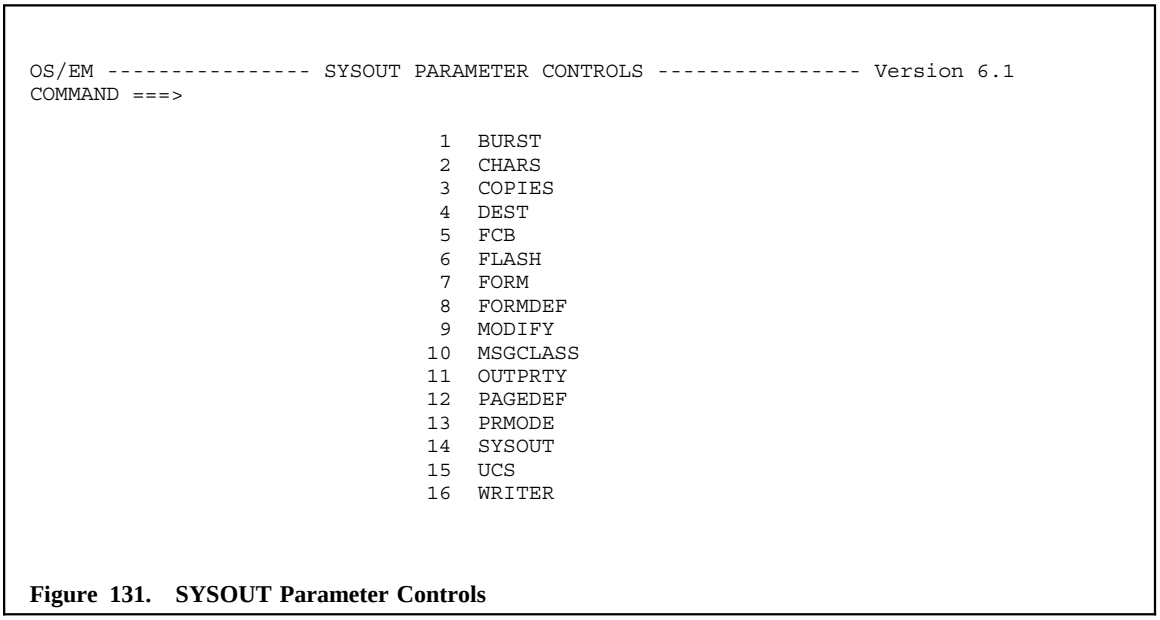

Figure 131. SYSOUT Parameter Controls

When a selection is made, the next panel will reflect your choice and the verbiage on the panel will also reflect your choice. In Figure 132 on page 5-136, the choice was number 14 and the verbiage reflects SYSOUT. The same panel will appear for the other choices, but the verbiage will be different.

The following parameters are available:

Parameter	*Description*
CHARS	Character arrangement tables
BURST	Use 3800 burster-trimmer-stacker
COPIES	Number of copies of hardcopy output
DEST	Destination for a SYSOUT dataset
FCB	Forms control buffer
FLASH	Forms overlay
FORM	Form name
FORMDEF	AFP form definition name
MODIFY	Copy modification module
MSGCLASS	SYSOUT class for the job log, allocation messages and JCL image
OUTPRTY	OUTPUT print priority.
PAGEDEF	AFP page definition
PRMODE	PSF process mode
SYSOUT	Output print class for generated output
UCS	Universal character set

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WRITER External writer name

The following figure is an example of the screen that will appear:

```
OS/EM ------------------ JCL CONTROLS: SYSOUT ------------------- Version 6.1
Command ===>                                                  Scroll ===> CSR

   SYSOUT checking is active       ===> YES             (Yes/No)

   SYSOUT values listed below
      or defined to security       ===> CHECK           (Allow/Disallow/Check)
   SYSOUT undefined to security    ===> ALLOW           (Allow/Disallow)
   Unlisted SYSOUT values          ===> ALLOW           (Allow/Disallow/Check)

  Optional security
  Class ===> ________   Resource ===> ________________________________________

 (CMD = (I)nsert (D)elete (S)elect)
  CMD   SYSOUT / Description
   '    P
        Production Print Class
****************************** Bottom of data ********************************
```

Figure 132. JCL Controls: SYSOUT

Field entry is as follows:

1. SYSOUT checking active

   Enter **YES** to activate SYSOUT checking.

   Enter **NO** to deactivate SYSOUT field checking.

2. Listed SYSOUT values or defined to security

   If you have entered values in the scrollable portion of this panel you may **allow** their use, **disallow** use, or **security check** the value.

   This field is the **controlling keyword** for this function. If you enter **ALLOW** or **DISALLOW**, you **must** enter items in the scrollable section of this panel, as those will be the items which are to be allowed or disallowed.

   If you have specified **ALLOW**, then the JCL parameter from the job being checked will be compared to the listed items. If the value is not found, then the **Unlisted values** field will determine if the value is allowed. See the **Unlisted values** field below for determining the action to be taken if the value is not found.

   If you have specified **DISALLOW**, then the JCL parameter from the job being checked will be compared to the listed items. If the value is listed, then the parameter is disallowed, and the job will receive a JCL error. If the parameter is not listed, then the **Unlisted values** field will determine if the value is allowed. See the **Unlisted values** field below for determining the action to be taken if the parameter is not found.

   If you have specified **CHECK**, and you have listed items in the scrollable portion of the panel, then the JCL parameter will be compared to those items. If a match is found, then the external security manager is checked to determine if the User submitting the job has access to the value listed.

   If this value is not defined to your security system, then the **undefined to security** field will determine the action to be taken.

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If this value is not defined in the list, then the **Unlisted values** field determines if the value is allowed.

If you enter **CHECK** and do not enter any items in the scrollable portion of the panel, all values will be checked against the external security manager. If the value is not defined to security then the **undefined to security** field will determine the action to be taken.

3. Parameter undefined to security

   If you have specified **CHECK** as the controlling keyword, any values which have not been defined to the external security manager will either be allowed or disallowed based on your entry here.

   This entry is ignored if the controlling keyword is ALLOW or DISALLOW.

4. Unlisted SYSOUT values

   This field specifies the action to be taken whenever a parameter is not found in the list of values displayed in the scrollable portion of the panel.

   Specifying **ALLOW** means that any parameter which was not found in the list of values will be allowed.

   DISALLOW specifies that the parameter which was not found in the list will be disallowed and the job will fail with a JCL error.

   Specifying **CHECK** will cause the parameter not found in the list to be checked via the external security manager.

5. Optional security

   This defines the security profile to be used when CHECK is specified.

   Class The general resource class to be used.

   Resource The resource name prefix. The value of general resource class and, optionally, the resource name. The value of the SYSOUT field will be appended to the value in the Resource field.

   For example, if the Resource field is set to SYSOUT, then the profile that will be checked is SYSOUT.value

   Notes:

   - The Class name must be specified if a Resource name is defined. The class can be any valid general resource class. Do not specify DATASET.
   - If the Resource field is left blank, the profile to be checked will be the value of the parameter field.
   - If both fields are blank, the default resource will be checked - JCL.parm.value in the FACILITY class (IBMFAC for CA-TOPSECRET). See “JCL & SYSOUT Parameter Checking” on page J-2 for a list of the default resource names.
   - READ access is required for the resource in order to be able to use the secured parameter value.

6. CMD

   To list specific data, use the scrollable portion of the panel. To insert a blank line, enter **I** in the CMD field.

   To delete a line, enter a **D** in the CMD field for the line to be deleted.

   To update a line, enter an **S** in the CMD field and overtype the information to be changed.

7. SYSOUT

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Enter the SYSOUT value(s) and/or SYSOUT mask(s) to be allowed, disallowed or checked with external security.

See “Appendix B. General Masking” on page B-1 for information about general field masking.

The example in Figure 132 on page 5-136 uses external security to control the use of the production SYSOUT class. The job will be terminated with a JCL error if the job has a DD with SYSOUT=P and the user does not have READ access authority to the resource. All other classes can be used by any job. In this case, the default resource class and profile names will be used (i.e. JCL.SYSOUT.P in the FACILITY class).

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Tape Usage Controls

Tape allocation checking occurs as each job step executes. That is, as each tape device is allocated, a count is accumulated and checked against the total limit specified for the job class. Once the total limit is exceeded, the job is cancelled unless operating in **WARN** mode.

```
OS/EM ------------------- TAPE USAGE CONTROLS ------------------- Version 6.1
Command ===>                                                  Scroll ===> CSR

     Max Tape Controls active   ===> YES        (Yes/No)

     Violators warned/cancelled ===> CANCEL     (Warn/Cancel)

(CMD = (S)elect)
                          Total    Total    Total    Total      Total    Total
 CMD  Class     Active    3420     3480     3490    3490-VTS    3590     Tapes
  '    A         YES       ___      ___      ___      ___        ___      0
  '    B         YES       ___      ___      ___      ___        ___      0
  '    C         YES       0        0        0        2          2        3
  '    D         NO        ___      ___      ___      ___        ___      ___
  '    E         NO        ___      ___      ___      ___        ___      ___
  '    F         NO        ___      ___      ___      ___        ___      ___
  '    G         NO        ___      ___      ___      ___        ___      ___
```

Figure 133. Tape Usage Controls

Field entry is as follows:

1. Max Tape Controls

   This field specifies that tape allocation control will be applied according to criteria established with the various CLASS parameters.

2. Violators Warned/Cancelled

   This field provides you with a way of observing your tape allocation rules without actually enforcing those rules. WTO messages are produced which will indicate the action OS/EM would have taken if WARN mode were not in effect.

3. SELECT

   To enable Tape Usage controls for a job class, select the class by placing an **S** in the CMD field and then overtyping the fields on that line.

4. ACTIVE

   Enter **YES** in the Active column to enable a CLASS.

   Enter **NO** to disable a CLASS.

5. Total Number of Tapes

   Each jobclass - A through 9 - can be individually enabled. Enter the total tapes allowed for each type of tape device as well as the total allowed for the step. Each number can be between 0 and 255. The number of 3420, 3480, 3490 3490-VTS and 3590 devices combined may exceed the total number allowed, however no single entry may be greater than the value specified for **total tapes**.

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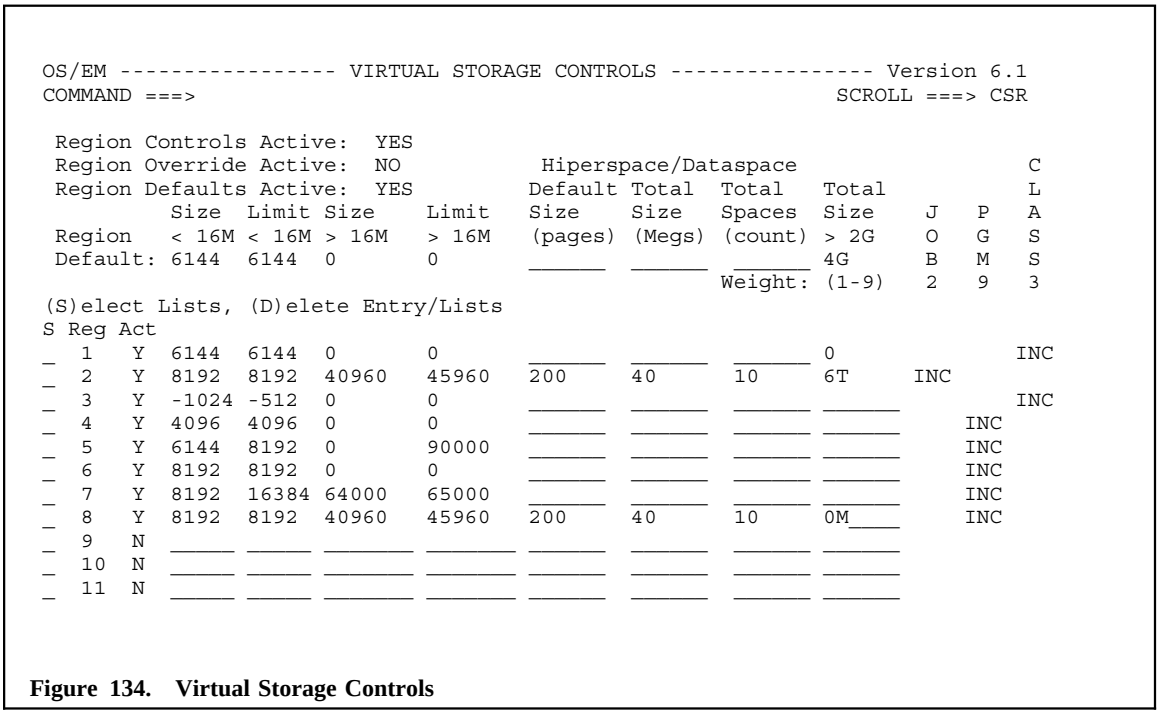
Virtual Storage Controls

Virtual Storage Controls provides the ability to set a region's virtual storage and override REGION= values specified in the JCL. Up to 32 region control rules can be defined to set virtual storage allocations. These controls can limit a job's virtual storage below the line, above the line, above the bar and hiper/dataspaces.

These region control rules are selected based on a job's JOBNAME, PGMNAME and/or JOBCLASS. Weightings can be applied to these parameters to determine the best rule to use when a job matches multiple rules.

Additionally, a default region control can be used when a job does not match any of the active rules.



```
OS/EM ----------------- VIRTUAL STORAGE CONTROLS ---------------- Version 6.1
COMMAND ===>                                                SCROLL ===> CSR

 Region Controls Active:  YES
 Region Override Active:  NO           Hiperspace/Dataspace                  C
 Region Defaults Active:  YES         Default Total  Total   Total          L
          Size  Limit Size    Limit   Size    Size   Spaces  Size    J   P  A
 Region   < 16M < 16M > 16M   > 16M   (pages) (Megs) (count) > 2G    O   G  S
 Default: 6144  6144  0       0       ______  ______ ______ 4G      B   M  S
                                                    Weight: (1-9)   2   9  3

(S)elect Lists, (D)elete Entry/Lists
S Reg Act
_  1   Y  6144  6144  0       0       ______  ______  ______ 0              INC
_  2   Y  8192  8192  40960   45960   200     40      10     6T     INC
_  3   Y  -1024 -512  0       0       ______  ______  ______ ______         INC
_  4   Y  4096  4096  0       0       ______  ______  ______ ______     INC
_  5   Y  6144  8192  0       90000   ______  ______  ______ ______     INC
_  6   Y  8192  8192  0       0       ______  ______  ______ ______     INC
_  7   Y  8192  16384 64000   65000   ______  ______  ______ ______     INC
_  8   Y  8192  8192  40960   45960   200     40      10     0M____     INC
_  9   N  _____ _____ _______ _______ ______  ______  ______ ______
_  10  N  _____ _____ _______ _______ ______  ______  ______ ______
_  11  N  _____ _____ _______ _______ ______  ______  ______ ______
```

Figure 134. Virtual Storage Controls

Field entry is as follows:

1. Region Controls Active

   Enter **YES** to enable Region Controls.

   Enter **NO** to disable Region Controls.

2. Region Override Active

   Enter **YES** to enable Region Override Controls

   Enter **NO** to disable Region Override Controls

   When Region Override is enabled, OS/EM will use the region values defined in the strongest rule that matches the job's characteristics. If there is no rule that matches the job's characteristics, the default values will be used (if defined & active).

   When Region Override is disabled, OS/EM values will only be used if the REGION= value is greater than the strongest rule or default values. The following values will be used:

   - When REGION= is greater than zero and less than or equal to 16M, the region size value for <16MB will be checked / used.
   - When REGION= is greater than 16MB, the region size value for >16MB will be checked / used.

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Regardless of the Region Override setting, if there are no rule matches AND no default values are defined (or Region Defaults is set to NO), the REGION= value (or the MVS defaults) will be used.

3. Region Defaults Active

   Enter **YES** to enable Region Defaults

   Enter **NO** to disable Region Defaults.

   This allows you to disable the default entries without disturbing the information already entered.

4. Region Defaults

   Specify the default values used by OS/EM for storage utilization control. These values are used if there is no matching region control rule.

   With the exception of Hiperspace/Dataspace values, and above the 2 Gigabyte bar, the numeric values are entered in K. Total spaces is entered as the total number of Hiperspaces/Dataspaces allowed within the region. Default size for Hiperspace is in 4K blocks. Total size of Hiperspace is in Megabytes. Refer to MVS Systems Modifications, SMF exit IEFUSI for further information regarding these parameters.

5. REGION

   The first value is the amount of storage, below the 16M line, a program will be given to execute in. A negative value may be entered indicating that the amount of storage is to be calculated by subtracting this value from the size of the private area currently available below the 16M line.

   The third value is the amount of storage, above the 16M line, a program will be given to execute in.

   A value of **0** or a blank field will result in the MVS defaults or the REGION= value to be used.

6. LIMIT

   The second value is the maximum amount of storage, below the 16M line, a program will be allowed to GETMAIN. A negative value may be entered indicating that the amount of storage is to be calculated by subtracting this value from the size of the private area currently available below the 16M line.

   The fourth value is the maximum amount of storage, above the 16M line, a program will be allowed to GETMAIN.

   A value of **0** or a blank field will result in the MVS defaults or the REGION= value to be used.

7. Hiperspace/Dataspace

   The fifth value is the default size of a Hiperspace or Dataspace when it is created in units of 4K blocks.

   The sixth value is the total size of storage that may be used for all user key Hiperspaces and Dataspaces in an address space, in units of 1 Megabyte increments.

   The seventh value is the total number of Hiperspaces or Dataspaces allowed within an address space.

8. MEMLIMIT

   The eighth value is the amount of storage a user may obtain above the 2 gigabyte bar up to a maximum of 16 exabytes. The value must be entered with the storage type specified as the last character of the amount, i.e. 16G would indicate 16 gigabytes, and 2P would indicate 2 petabytes. Use **M** for megabytes, **G** for gigabytes, **T** for terabytes and **P** for petabytes.

   For space above the 2G bar, you may enter 0M to indicate that **NO** space above the bar may be used. Entering **0** without a type modifier indicates that the system default will be used.

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9. Weight

   Enter a number between 1 and 9 for each of the selection list types.

   If a job matches more than one region control definition, these weight values will be used to determine which definition to use. In other words, if a job matches region 2 because of the job class, and matches region 3 because of the program name, and the weight value for job class is 8 while the weight for program name is 2, region 2 will be selected because its weight will be higher.

10. JOB, PGM, CLASS Options

    The optional region parameters (1-32) specify storage values that will be applied to specified program names, job names, or job classes.

    To enable an individual region, enter a **Y** in the Active column, and any numeric values which should be different than the default values.

To enter selection criteria enter an **S** in the command column and press the ENTER key. Another panel will be displayed where you can specify the selectors for this region definition.

```
OS/EM ------------------------ SELECTOR ENTRY - 4 --------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

 Enter Selector Types, either Include or Exclude
     Jobclass ===> INCLUDE   Jobname ===> INCLUDE   Pgmname ===> INCLUDE

 Line Cmds: (D)elete line, (I)nsert line

   Selector
     Type    Selector Name/Mask List
_  JOBCLASS  P:R
_  JOBNAME   LCRD0102 MRPD-
_  PGMNAME   IFCEREP1
****************************** Bottom of data ********************************
```

Figure 135. Selector Entry Panel

This panel allows you to enter the selection criteria for a region group. You may enter the following types of items:

JOBCLASS The class of the job being evaluated.

JOBNAME The jobname of the job being evaluated.

PGMNAME A program that will execute in the job being evaluated.

Each **Selector Type** may be either an **INCLUDE** group or an **EXCLUDE** group. This means that selectors marked as an include group must match the attributes of the job being evaluated. Selectors marked as an exclude group must **not** match the attributes of the job being evaluated.

Separate the names or masks with a space. You may enter as many names/masks as will fit on the line. To enter more items, simply insert another line and enter the same selector type keyword.

Multiple names/masks within a selector type are considered to be **OR** conditions. That is, if any of them are matched the condition is satisfied. Specifying multiple selector types, however, is considered to be an **AND** condition. All selector types must be satisfied in order for the region control to be assigned to the job being evaluated.

Masks: The following table shows the allowable mask characters:

Qualifier Description

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? The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.

& The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.

% The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.

- The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

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Job Controls

Description

JOB Controls provides the option for Step end statistics, JOB end statistics, TSO logoff statistics, Surrogate password processing, use of certain functions during TSO submit processing, correction of NOT CATALOGED 2 conditions, control number of concurrently running jobs by user or program, and allow SYSOUT extensions.

Summary of Features

- Correction of NOT CATALOGED 2 conditions specified by JOBCLASS including
  - Uncatalog and delete the improper dataset and catalog the new dataset
  - Uncatalog the improper dataset and catalog the new dataset
  - Cancel the JOB with a JCL error
- Surrogate Password processing provides
  - Password insertion in the JOB card for NJE processed JOBs for TSO Users
  - Password insertion in the JOB card for JOBs submitted by authorized JOBs, STCs and/or Users that may submit JOBs for other Users
- Enforce TSO submitted JOBs by JOBCLASS having jobnames starting with the USERID of the User submitting
- Add Notify parameter to TSO submitted JOBs by JOBCLASS
- Control submission of MVS Commands imbedded in JOBs by TSO Users
- Control submission of JES2 Commands imbedded in JOBs by TSO Users
- JOB end WTO in JESLOG for highest step end condition code
- STEP end WTO in JESLOG with step condition code
- Step end statistics including I/Os by DDNAME in JES Messages
- JOB end statistics in JES Messages
- Customization of step end statistics flower box including Customer Description
- WTOR option by JOBCLASS for operator cancelled JOBs
- Highlighted WTO option by JOBCLASS for abended JOBs
- Terminal display of TSO usage statistics at logoff
- Limit number of concurrently running jobs by user ID
- Limit number of specific programs concurrently running by program name
- Issue a message to submitter when job actually starts running
- Reformat the accounting field of job cards
- Allow SYSOUT lines extensions
- Ensure that the submitter of a job is defined to RACF

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Job Controls Menu

The Job Controls Menu presents sixteen selections. Each option presents another selection menu, taking you down the path you have chosen.

Several options are activated for a specific JES2 subsystem. These options show the currently selected JES2 name to the right of the menu item. To specify the JES2 subsystem that the control will effect, set the name using the **Set JES2 Name and User Fields** menu item (“Set JES2 Name” on page 8-1).

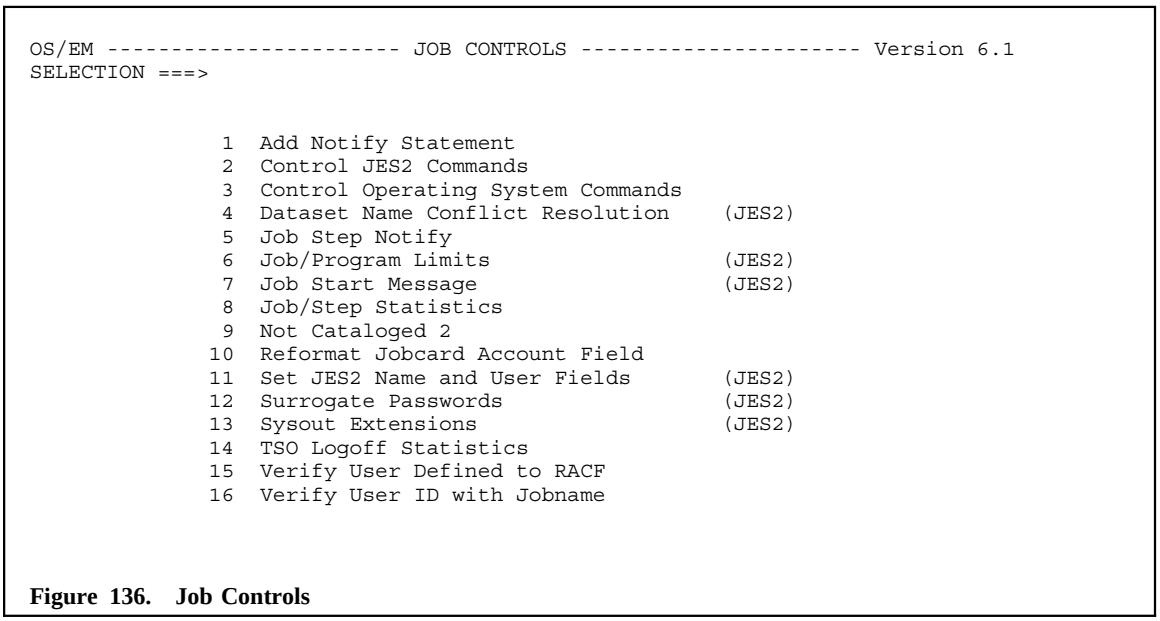

Figure 136. Job Controls

Each of these paths is presented in the following sections:

1. Add Notify Statement (see “Add Notify Statement” on page 5-147)
2. Allow JES2 Commands (see “Control JES2 Commands” on page 5-148)
3. Allow Operating System Commands (see “Control Operating System Commands” on page 5-149)
4. Dataset Name Conflict Resolution (see “Dataset Name Conflict Resolution” on page 5-150)
5. Job Step Notify (see “Job Step Notify” on page 5-151)
6. Job/Program Limits Controls (see “Job/Program Limits” on page 5-152)
7. Job Start Message (see “Job Start Message” on page 5-159)
8. Job/Step Statistics (see “Job/Step Statistics” on page 5-160)
9. Not Cataloged 2 (see “Not Cataloged 2 Correction” on page 5-163)
10. Reformat Jobcard Account Field (see “Reformat Jobcard Account Field” on page 5-165)
11. Set JES2 Name and User Fields (see “Set JES2 Name” on page 8-1)
12. Surrogate Passwords (see “Surrogate Password Control” on page 5-166)
13. Sysout Extensions (see “Sysout Extensions” on page 5-169)
14. TSO Logoff Statistics (see “TSO Logoff Statistics” on page 5-175)
15. Verify User Defined to RACF (see “Verify User Defined to RACF” on page 5-176)

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16. Verify User ID with Jobname (see “Verify User ID with Jobname” on page 5-177)

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Add Notify Statement

ADD NOTIFY specifies that a NOTIFY parameter is to be inserted on the job statement if it is missing. The insertion is limited to the classes specified.

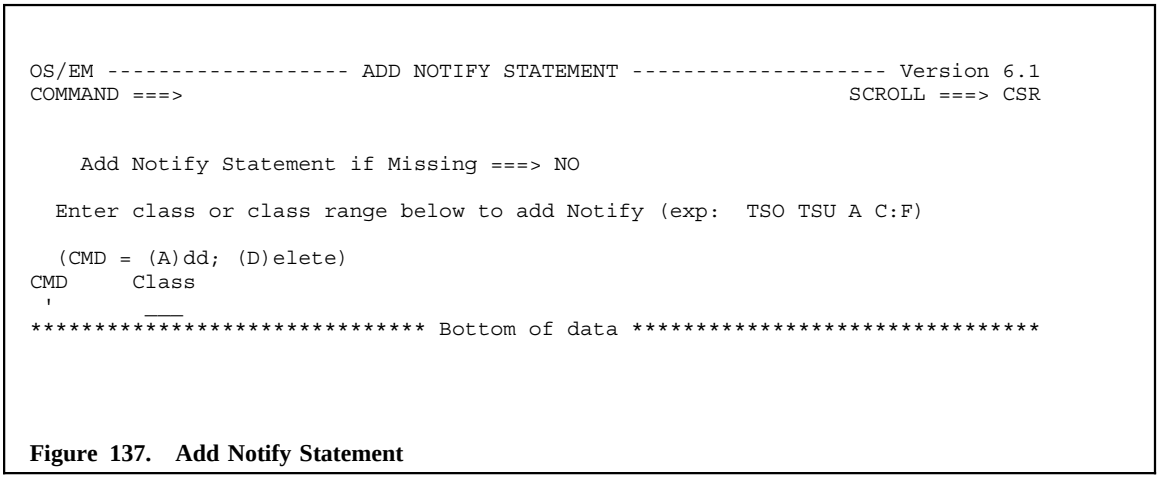

Figure 137. Add Notify Statement

Field entry is as follows:

1. ADD NOTIFY

   Enter **YES** to have OS/EM add a NOTIFY parameter to a job of it is missing, or enter **NO** to disable this option.

2. Add or Delete

   To make the check universal, enter the class as **A:9**.

   To enter a class, type an **A** in the CMD field and overtype the class.

   To delete a previously entered class, type a **D** in the CMD field of the class to be deleted.

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Control JES2 Commands

This function controls the use of JES2 commands imbedded in JCL that is submitted by TSO users.

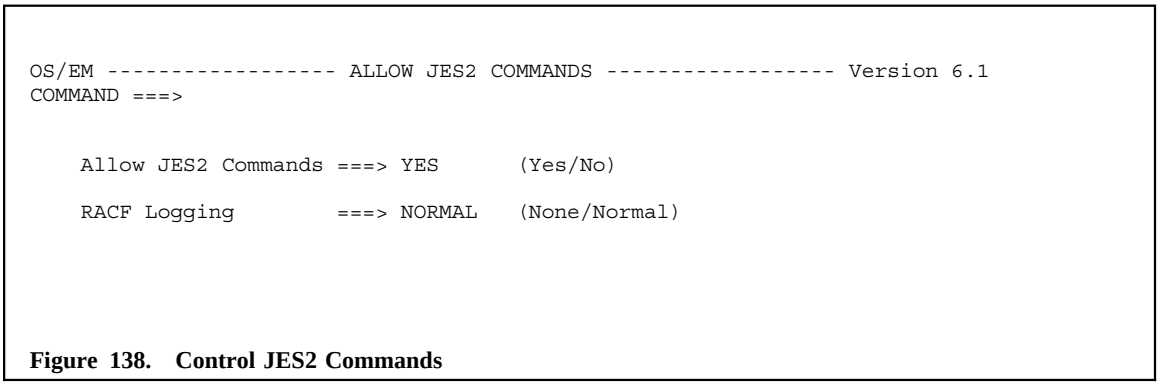

Figure 138. Control JES2 Commands

Field entry is as follows:

1. Entering **YES** specifies that a check is done to ensure that the user is authorized to submit jobs that contain JES2 commands. The user can be limited to only specified commands, all commands, or can be precluded from submitting jobs with any JES2 commands.
2. Specifying NO for this field disables this option.
3. Enter **NORMAL** or **NONE** to control RACF logging.

The command authorization is done by using classname FACILITY for RACF and CA-ACF2, and classname IBMFAC or DATASET for CA-TOPSECRET. The resource name is JES2.$cmd where 'cmd' is the desired JES2 command.

Each defined command must be a single letter: with four exceptions; $VS, $ADD, $TRACE and $DEL.

If the user is not permitted to any JES2.$cmd resources, the user will not be allowed to include JES2 commands in any submitted jobs. **READ** authority is required for access to the command.

Usage Restrictions:

- This function only provides JES2 command security for jobs submitted from TSO.

  This function will only secure JES2 commands that are issued with the COMMAND JCL statement. /*$ JCL statements that are located before the JOB JCL statement are not secured with this facility.

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```
OS/EM ------------------- ALLOW O/S COMMANDS ------------------ Version 6.1
COMMAND ===>


    Allow Operating System Commands ===> YES      (Yes/No)

    RACF Logging                    ===> NORMAL   (None/Normal)
```

Figure 139. Control Operating System Commands

Entering **YES** specifies that a check is done to ensure that the user is authorized to submit jobs that contain operating system commands. The user can be limited to only specified commands, all commands, or can be precluded from submitting jobs with any operating system commands.

Specifying NO for this field disables this option.

Enter **NORMAL** or **NONE** to control RACF logging.

The command authorization is done by using classname FACILITY for RACF and CA-ACF2, and classname IBMFAC or DATASET for CA-TOPSECRET. The resource name is COMMAND.cmd where 'cmd' is the desired MVS command.

Each defined command must be in its LONG form; i.e., VARY, not V.

If the user is not permitted to any MVS.command resources, the user will not be permitted to include operating system commands in any submitted jobs. **READ** authority is required.

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Dataset Name Conflict Resolution

The Dataset Name Conflict Resolution function prevents jobs from being selected for execution until all needed datasets are available. This prevents a job from taking an initiator when it is actually unable to run because datasets are already in use by another job or user. TSO **send** messages may optionally be issued to operators, the job owner and/or the owner of the dataset.

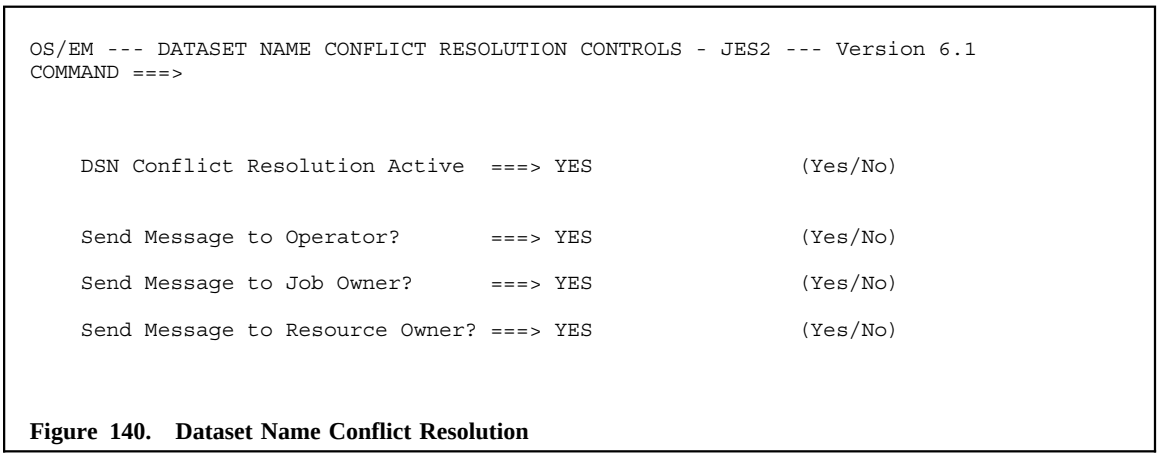

Figure 140. Dataset Name Conflict Resolution

Field entry is as follows:

1. DSN Conflict Resolution Active

   Enter **yes** to activate the function or **no** to turn the function off.

2. Send Message to Operator?

   Enter **yes** to have OS/EM send a message to the console listing the datasets which are unavailable.

3. Send Message to Job Owner?

   Enter **yes** to have OS/EM send a message to the jobs owner notifying them that a dataset needed by their job is unavailable.

4. Send Message to Resource Owner?

   Enter **yes** to have OS/EM send a message to the person who has control of the needed dataset.

Usage Notes:

- This function analyzes all DD JCL statements and checks if the dataset is already allocated. If the DISP for the DD is in conflict with existing allocations (e.g. DISP=OLD is specified for a dataset that that is currently allocated with DISP=SHR) the job will not be selected until all allocation conflicts are resolved.
- Since this function can only examine the DD JCL statements, any job that uses dynamic allocation for a dataset that is already allocated cannot be blocked from selection (the job will be suspended by GRS when the conflict is encountered).
- The $DJ and $LN operator commands will display a job's status including any datasets that are required but currently not available. See “Appendix F. JES2 Commands” on page F-1 for more information about these commands.

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Job Step Notify

The Job Step Notify panel allows you to request that OS/EM send a message at the end of each job step for non-zero return codes.

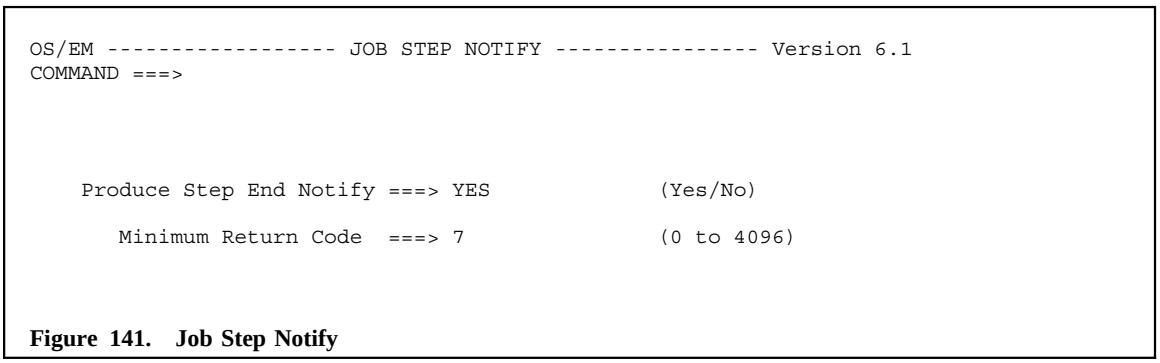

Figure 141. Job Step Notify

Field entry is as follows:

1. Produce Step End Notify

   Enter **YES** to have a message sent to the user ID specified on the jobcard.

2. Minimum Return Code

   If you leave the minimum return code field blank or enter zero, a message is sent for any non-zero return code. Specifying a number above zero results in a message being sent for any step with that value or higher.

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Job/Program Limits

You may control the number of jobs running either by User ID or Program Name.

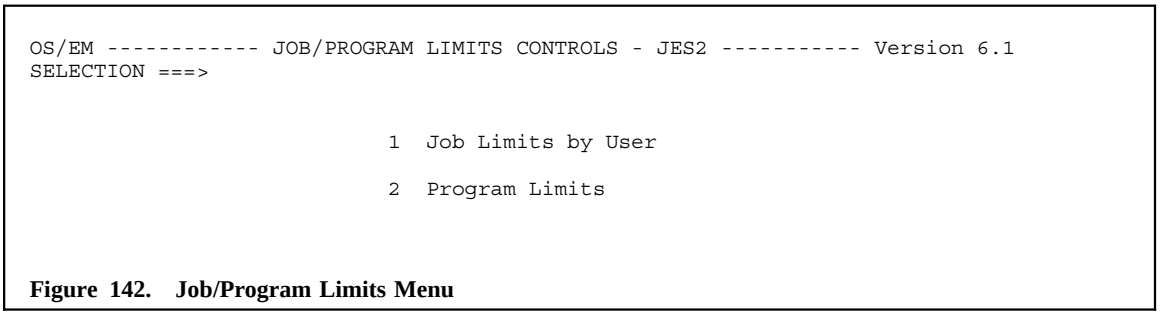

Figure 142. Job/Program Limits Menu

Select the type of job limiting you want to perform.

1. Job Limits by User (see “Job Limits By User” on page 5-153)
2. Program Limits (see “Program Limits” on page 5-157)

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Job Limits By User

The JOB LIMITING function enables the customer to control the number of jobs each user may have executing at a single time. This control may be for a single system, all systems in a multiple access spool environment, or specific system IDs. Additionally, the control can be limited to specific job classes, selected job names, certain user IDs and limited by time of day and day of week. Please note that all jobclasses are checked to determine the number of currently executing jobs unless limited by the SCOPE option.

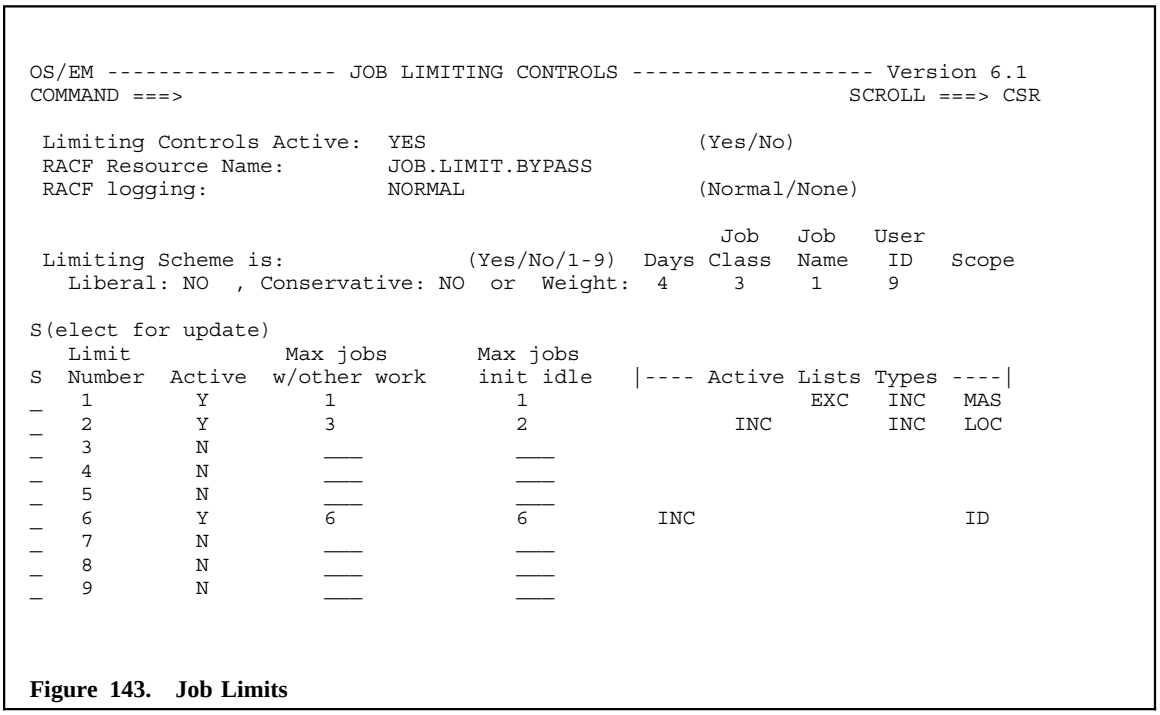

Figure 143. Job Limits

The Job Limiting Controls main entry panel has a fixed area in the top half of the panel where you enter global information about the function.

The bottom half of the panel is scrollable, and stores the information regarding the 32 limit selection groups.

Field entry is as follows:

```
Limiting Controls Active: ___                (Yes/No)
```

This field is the first field in the fixed portion of the panel. It controls whether any Job Limiting Controls are active or not. Entering NO here will turn off all Job Limiting Controls without disturbing any of the detail information previously entered.

```
RACF Resource Name:       _______________
```

To allow a user or group of users to bypass the Job Limiting controls enter the name of the RACF profile you have defined in the General Resource FACILITY class (for RACF and ACF-2) or the IBMFAC class (CA-Topsecret). Users to be allowed to bypass this control must have read authority to this profile.

```
RACF logging:             ______             (Normal/None)
```

If you want RACF logging, enter NORMAL in this field. To turn off RACF logging, enter NONE.

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```
                                                          Job   Job   User
   Limiting Scheme is:              (Yes/No/1-9)  Days Class  Name   ID
     Liberal: ___, Conservative: ___ or  Weight:  _     _     _     _
```

When a job being submitted matches more that one selection group, the **Scheme** controls which group will be used.

If a scheme of LIBERAL is selected, the selection group which allows the most jobs to execute is used. Conversely, a CONSERVATIVE scheme will use the group which allows the least number of jobs to execute.

You may instead elect to give the different include/exclude lists additional weight by specifying a number from 1 to 9 for the list type. Weights are used when a job matches multiple selection lists. The weight of each list is calculated by adding the weight value specified for each matching include/exclude type. This means that if list 1 has a weight of 9 for user ID and a weight of 2 for the job class the total weight for list 1 would be 12 (1 for simply matching, 2 for job class and 9 for user ID = 12). The list having the highest weight would be used.

```
    Limit            Max Jobs      Max jobs
 S  Number  Active  w/other work   init idle   |---- Active Lists Types ----|
 _   1        Y         1             2          INC   EXE   INC   EXE   ID
```

In the above example which shows group 1, you can see that the group is active, only 1 job may execute at a time when other work is waiting to be processed; 2 jobs may execute at a time if an initiator attempts to select work, and nothing else is available to run. There are 4 active lists for the group: an include list for DAYS, an exclude list for JOB CLASSES, an include list for JOB NAMES and an exclude list for USER IDs. The scope of the group is by system IDs.

To update the number of jobs or whether a group is active, simply overtype the fields and press enter. To update a selection group, you must place an 'S' in the select column.

Note: If using Work Load Manager (WLM) initiators, only the **Max Jobs Init Idle** limit is used as WLM initiators are normally available.

The scrollable portion of the panel contains entries for the 32 available limit selection groups.

After entering an 'S' and updating the number of jobs (if necessary), pressing the enter key will present the SELECTOR ENTRY panel.

The SELECTOR ENTRY panel allows you to specify the type of information jobs will be evaluated against.

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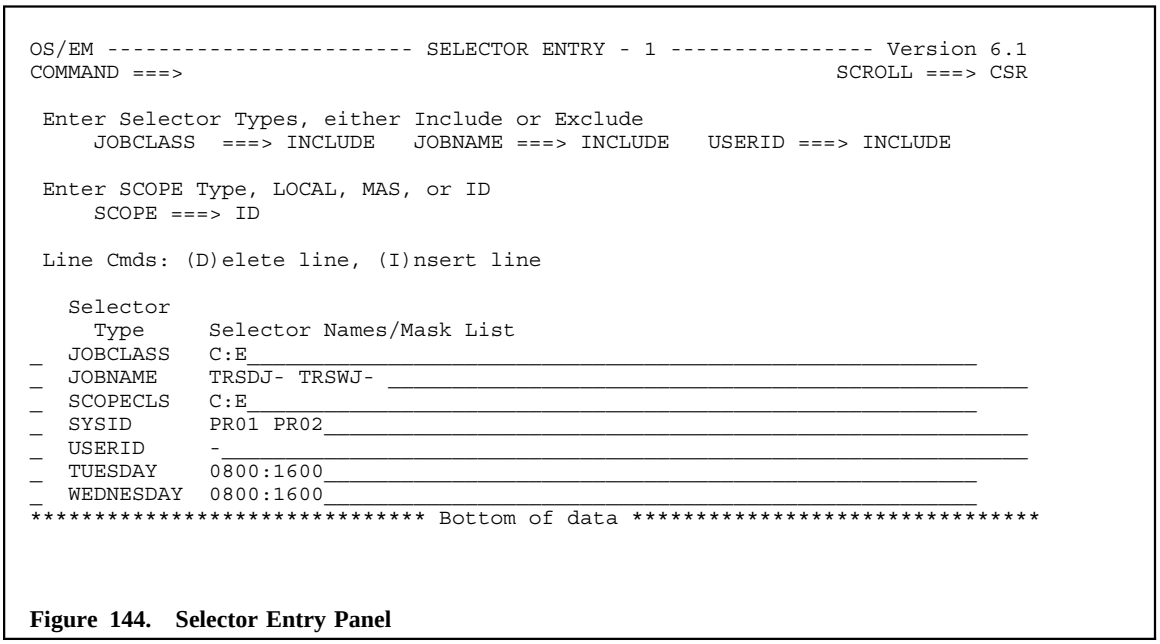

Figure 144. Selector Entry Panel

The available selector types are:

MONDAY - SUNDAY
Allows you to specify the time of day, by day of week that JOB LIMITS controls will be active.

Enter the time as a range using a 24 hour clock. 8AM to 4PM would be entered as 0800:1600.

USERID This list may contain either user IDs which will be INCLUDED, or IDs which are to be EXCLUDED. If you specify an include type group, only those IDs, or ID masks you enter will be affected by job limits. If it is an exclude list, everyone except the entered IDs will be subject to job limits. This is the ID taken from the job card USER parameter which defaults to the ID of the submitter if not present on the job card.

JOBNAME This list contains job names or job name masks. Again this list type may be either an include or exclude list.

JOBCLASS This list contains any job classes which you may wish to have job limits limited to, or job classes which job limits will not affect.

Note: The classes specified here are only to select jobs which may have the limiting controls applied to them. They do **not** affect how jobs are counted. By default all job classes are checked for executing jobs. You may limit the classes whose jobs are counted with the SCOPE parameter explained below.

SCOPECLS This selector type controls which execution classes are to be considered when executing jobs are counted. This selector works in conjunction with the SCOPE Type setting (see below).

SYSID If SCOPE Type has been set to ID, you need to list the system IDs using this selector type.

You also specify the scope of the job limiting controls. The scope types and their function are:

MAS Multiple Access Spool. Specifying MAS will cause OS/EM to check each system in the MAS for executing jobs before allowing a job to execute.

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LOCAL
Specifying LOCAL will limit the job limiting controls to only the machine where OS/EM is executing. No other system in the sysplex will be checked.

ID Enter a selector type of SYSID to specify the 4 character system ID of the LPARs in the MAS you want OS/EM to check for executing jobs.

Along with SCOPE, you may specify which classes will be used for the purpose of counting the number of active jobs a user may have running. If used, only the jobclasses specified will have their executing jobs counted. Use the selector type SCOPECLS to specify the classes to be checked.

Note: This parameter is the only way to control which jobclasses are used to count the number of executing jobs. If not specified every job executing regardless of jobclass will be counted to determine the number of jobs a user currently has executing.

For example if job class 'A' is the only class listed here, only jobs executing in class 'A' will be counted even if you are limiting jobs in another class. This means that if your are limiting jobs running in job class 'D' and the SCOPE is set for job class 'A', your users will be able to run as many jobs as the want in class 'D' as long as they keep the number of their jobs executing in class 'A' below the limit specified.

It is suggested that if you are limiting jobs that can execute in a particular job class, that you have the matching job class specified in SCOPECLS as well.

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Program Limits

The Program Limits function allows you to control how many copies of a program may be run concurrently.

Note: This function must be specified for each JES2 subsystem you have executing to limit programs by LPAR. See "Set JES2 Name" on page 8-1.

```
OS/EM --------------------- PROGRAM LIMITS - JES2 ---------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

 Program Limits Active ===> YES                    (Yes/No)

 Produce MAS Limit Changed Message ===> YES        (Yes/No)

(I)nsert (D)elete
                      --Limits--
S Active  Program    Local  MAS  Description
_  YES    IEFBR14     10    10
_  YES    SAS          1     2    Uses lots of resources.
****************************** Bottom of data ********************************
```

Figure 145. Program Limits Entry Panel

The top portion of this panel contains two fields:

- Program Limits Active

  Enter **YES** to enable this function or **NO** to disable it.

- Produce MAS Limit Changed Message

  Enter **YES** to enable message FEM2LM264 which has the format:

```
OS/EM sysname pgmname PGM LIMITS(xx xx) SET BY SYSTEM sysname JOB jobname.
```

The bottom portion of the panel contains a scrollable area listing all the programs which are being controlled.

Two line commands are available for this portion of the panel.

I Inserts a blank line to allow entry of program information.

D Deletes existing program information.

To control a program, insert a blank line then type the information required:

Active Enter **YES** to have this entry controlled. You may mark an existing entry **NO** to have OS/EM ignore the listed information, but not lose it so you may reactivate the entry at a later time.

Program The name of the program to be controlled.

Local Limit Enter the number of concurrently executing copies of the program allowed.

Leaving this field blank effectively marks the program as having no local limits.

MAS Limit Enter the number of concurrently executing copies of the program allowed within the MAS.

Leaving this field blank effectively marks the program as having no MAS limits.

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Description An optional description line possibly used to explain why you are limiting this program (license restrictions; resource hog).

All programs executing on the system are counted, however only batch jobs will be blocked from execution if the number of running programs is above the limits specified above.

Note: The **MAS** value is propagated to each system within the MAS which has Program Limiting active when you execute your changes online.

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Job Start Message

The Job Start Message function of OS/EM sends a message to the TSO ID of the user specified in the NOTIFY parameter of the job card.

The message is sent when the job actually starts executing.

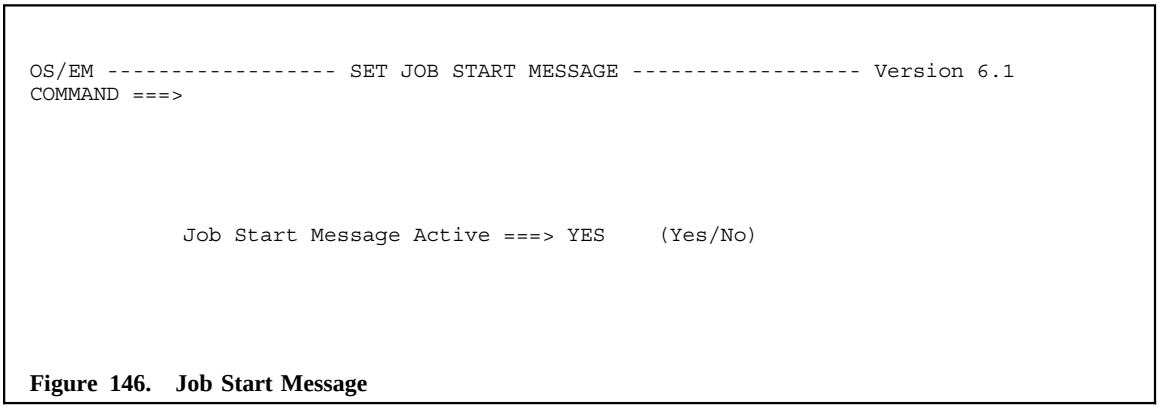

Figure 146. Job Start Message

Field entry is as follows:

Enter a **YES** to activate this function.

Enter a **NO** to deactivate it.

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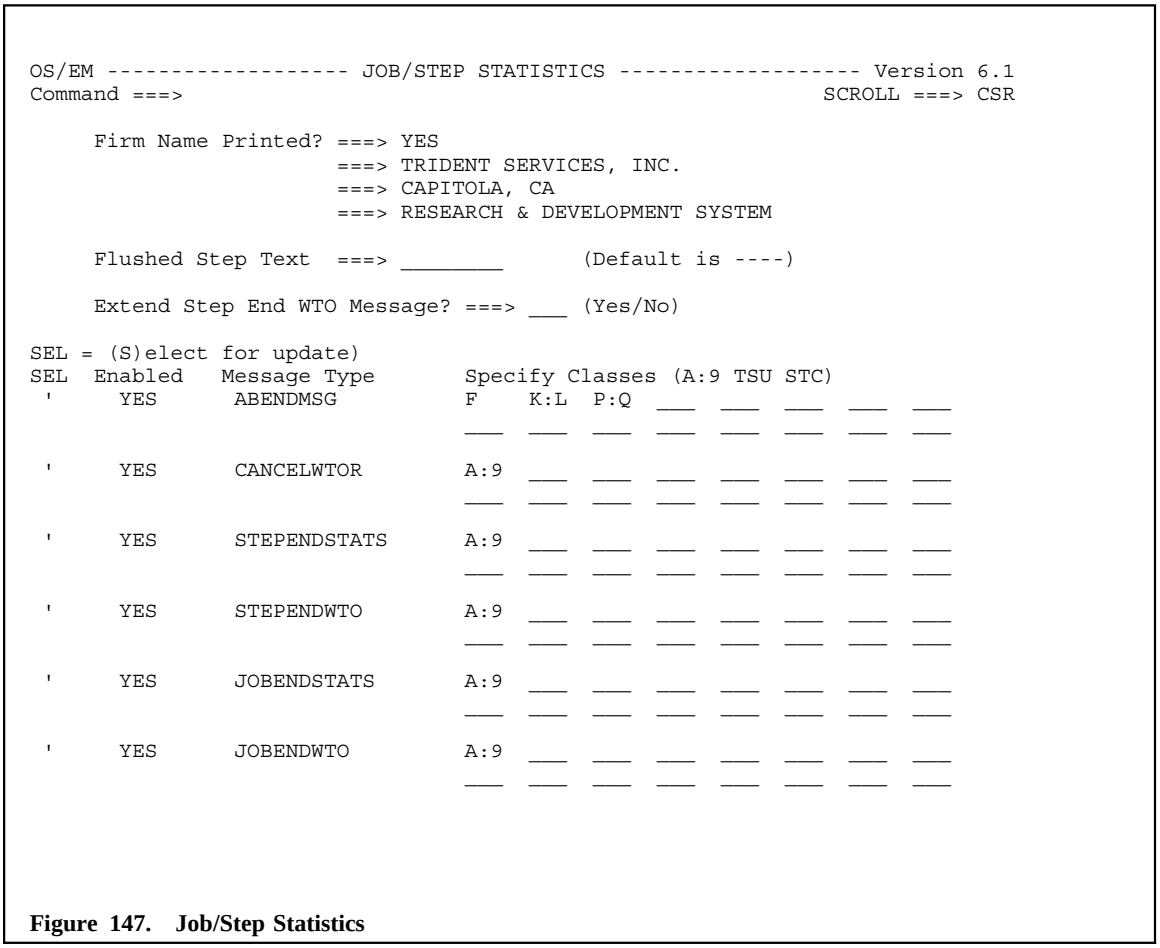
Job/Step Statistics

This function enables job end and step end messaging and execution statistics.

These functions are controlled by job class (including TSO, Started Task and, in some instances, Open Edition).



```
OS/EM ------------------- JOB/STEP STATISTICS ------------------- Version 6.1
Command ===>                                                  SCROLL ===> CSR

     Firm Name Printed? ===> YES
                        ===> TRIDENT SERVICES, INC.
                        ===> CAPITOLA, CA
                        ===> RESEARCH & DEVELOPMENT SYSTEM

     Flushed Step Text  ===> ________      (Default is ----)

     Extend Step End WTO Message? ===> ___ (Yes/No)

SEL = (S)elect for update)
SEL  Enabled   Message Type       Specify Classes (A:9 TSU STC)
 '     YES      ABENDMSG          F    K:L  P:Q  ___  ___  ___  ___  ___
                                  ___  ___  ___  ___  ___  ___  ___  ___

 '     YES      CANCELWTOR        A:9  ___  ___  ___  ___  ___  ___  ___
                                  ___  ___  ___  ___  ___  ___  ___  ___

 '     YES      STEPENDSTATS      A:9  ___  ___  ___  ___  ___  ___  ___
                                  ___  ___  ___  ___  ___  ___  ___  ___

 '     YES      STEPENDWTO        A:9  ___  ___  ___  ___  ___  ___  ___
                                  ___  ___  ___  ___  ___  ___  ___  ___

 '     YES      JOBENDSTATS       A:9  ___  ___  ___  ___  ___  ___  ___
                                  ___  ___  ___  ___  ___  ___  ___  ___

 '     YES      JOBENDWTO         A:9  ___  ___  ___  ___  ___  ___  ___
                                  ___  ___  ___  ___  ___  ___  ___  ___
```

Figure 147. Job/Step Statistics

Field entry is as follows:

- **FIRM Name Printed ?**

  This option enables the inclusion of company / site information in the Job / Step end statistics that are displayed in the job's allocation messages.

  YES includes the three lines of text in the Job/Step Statistics.

  NO suppresses the information in the Job/Step Statistics.

  Note: JOBENDSTATS and/or STEPENDSTATS must also be enabled for this option to be relevant.

- **Flushed Step Text**

  By default, OS/EM displays 4 dash marks as the condition code for any step which the system has flushed. To have OS/EM print a text string, enter the string here. It may be up to 8 characters long.

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- **Extend Step End WTO Message?**

  This option adds CPU and I/O statistics to the Step End message that is displayed in the JES2 message log.

  YES will include the extended information in the Step End message.

  NO will result in the standard Step End message being issued.

  Note: The STEPENDWTO option must be enabled in order for this option to be relevant.

- **ABENDMSG**

  This option forces job abend messages to remain on the console, requiring that the operator specifically delete the message from the console (this will ensure that the operator sees the message before it rolls off the console screen).

- **CANCELWTOR**

  This option prompts the operator to enter an explanation in response to a job being cancelled.

- **STEPENDSTATS**

  This option specifies that step end statistics be produced and placed in allocation message log.

- **STEPENDWTO**

  This option places a message in the JES2 message log for the completion of every job step. This message includes the return code for the step.

  Notes :

  The **Extent Step End WTO Message** option can also provide CPU & I/O statistics in the step end message (see above).

  If classes TSU or STC are selected, the operating system may additionally issue an IEF170I message these tasks. This message may be ignored or added to your MPF PARMLIB member / automated operations product for suppression.

- **JOBENDSTATS**

  This option produces job end statistics to pbe placed in the allocation message log.

- **JOBENDWTO**

  This option places a message in the JES2 message log for the completion of the job. This message includes the highest step return code and elapsed & CPU times for the job.

  Note: If classes TSU or STC are selected the operating system may additionally issue an IEF170I message at execution time for these tasks. This message may be ignored or added to your MPF PARMLIB member / automated operations product for suppression.

Specifying Job Classes

The scope of the above options are limited by job class. Valid job classes are:

- A - Z
- 0 - 9
- STC (Started Task)
- TSU (Started Task)
- OE (Open Edition / OMVS Tasks) - valid only for JOBENDWTO and STEPENDWTO.

Job classes can be defined as:

- A single batch job class (e.g. **D**)

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- A range of batch job classes (e.g. **A:L**)
- **A:9** specifies all batch job classes
- STC, TSU and OE must be specified in separate fields

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Not Cataloged 2 Correction

With this option, OS/EM allows you to avoid receiving **Not Cataloged 2** errors. OS/EM will attempt to correct a **Not Cataloged 2** error by one of three means:

- OS/EM will delete and uncatalog the previous version of the file causing the error and re-drive the catalog request.
- OS/EM will uncatalog the previous version of the file causing the error and then re-drive the catalog request.
- OS/EM will fail the job receiving the error.

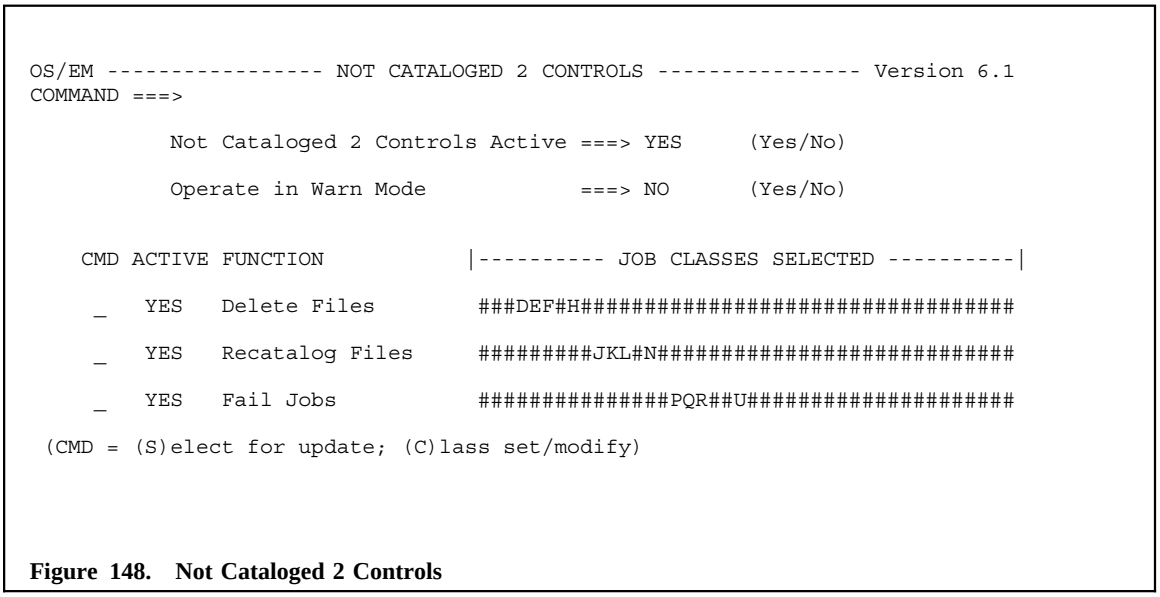

Figure 148. Not Cataloged 2 Controls

Field entry is as follows:

1. Controls Active

   Enter **YES** to enable OS/EM control of **Not Cataloged 2** errors.

   Enter **NO** to disable controls.

2. Operate in Warn Mode

   WARN mode provides you with a way of observing **Not Cataloged 2** events without changing the result of a job's execution. WTO messages are produced which will indicate the action OS/EM would have taken if WARN mode were not in effect.

   Note : WARN mode only applies to the **Fail Jobs** control option. If active, the Delete Files and/or Recatalog Files controls will be performed regardless of the WARN mode setting.

3. Delete Files

   To have OS/EM **delete** an existing file and re-drive the catalog request, place a **C** in the CMD field, enter **YES** in the ACTIVE field then press the Enter key. A popup window will open to allow you to enter the job classes that the Delete function will be monitor.

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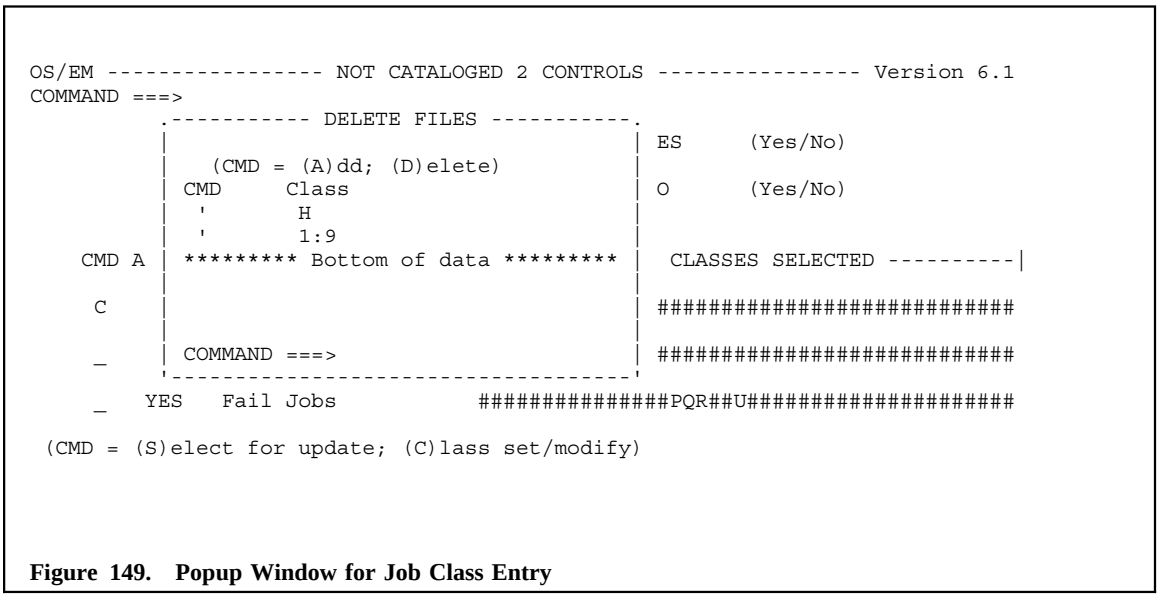

Figure 149. Popup Window for Job Class Entry

4. Recatalog Files

   To have OS/EM uncatalog an existing file and **recatalog** it, place a **C** in the CMD field, enter **YES** in the ACTIVE field, then press the Enter key. A popup window will open to allow you to enter the job classes that the Recatalog function will monitor (see Figure 149).

5. Fail Jobs

   To have OS/EM **fail** a job, place a **C** in the CMD field, enter **YES** in the ACTIVE field then press the Enter key. A popup window will open to allow you to enter the job classes that the Fail function will be monitor (see Figure 149).

Note: You should always specify the FAIL option with both the **Delete Files** and the **Recatalog Files**; this insures that if a **Not Catalog 2** condition is encountered and OS/EM should fail in correcting the **Not Cataloged 2** condition, the Job will be failed with a JCL error.

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Reformat Jobcard Account Field

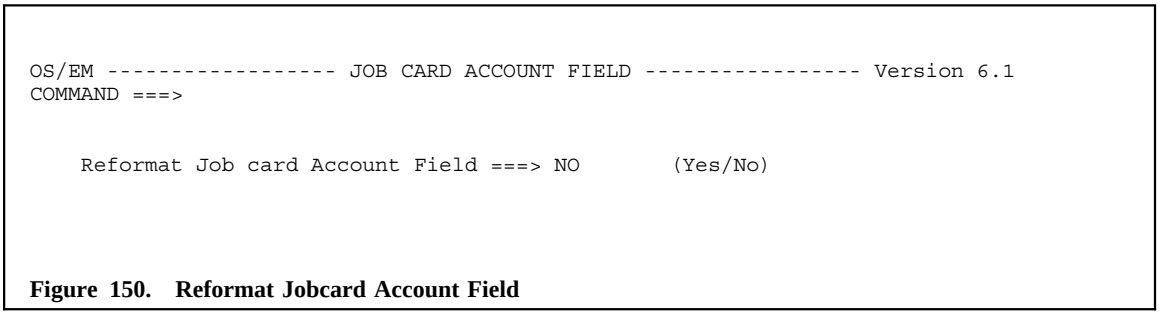

Figure 150. Reformat Jobcard Account Field

Field entry is as follows:

1. Entering **YES** specifies that account numbers of the form (XX-YY), 'XX-YY', and XX-YY are to be converted to (XX,YY). That is, remove surrounding apostrophes or replace with parentheses if none are present, and convert dashes to commas.
2. Specifying **NO** for this field disables this option.

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Surrogate Password Control

Surrogate password control through OS/EM is intended to supply passwords to jobs submitted by started tasks, TSO users, or other batch jobs so that these jobs can properly access RACF protected datasets.

This panel also controls whether password information will be added to jobs sent over a JES network and whether a password of 1 to 8 question marks found on a jobcard will be replaced with the user's password.

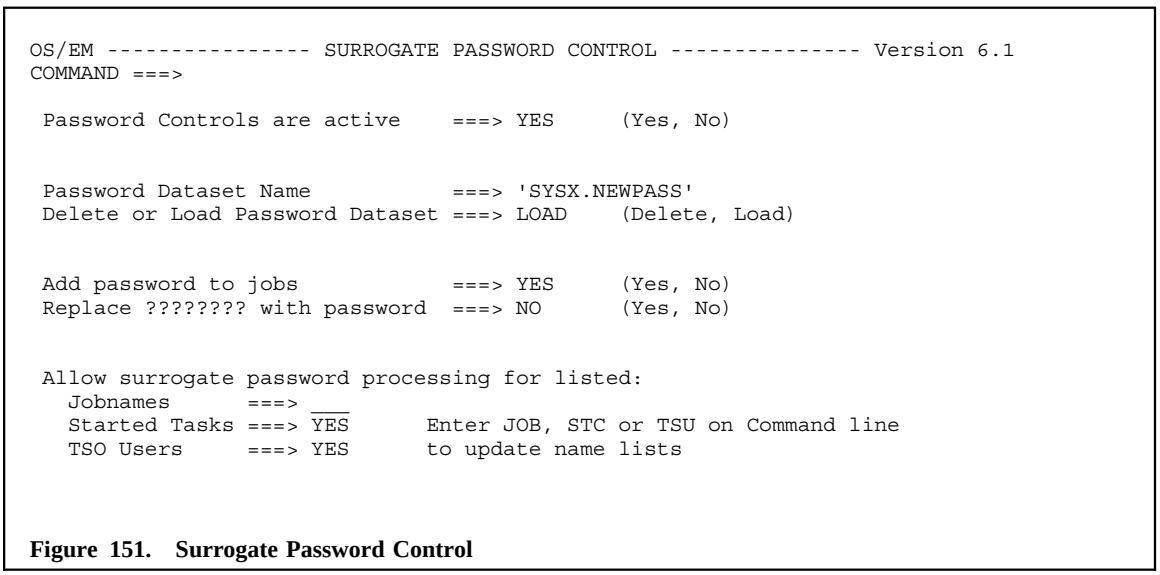

Figure 151. Surrogate Password Control

Field entry is as follows:

1. Password Controls

   Password controls activates the optional OS/EM password function.

   Enter **YES** to enable this function.

   Enter **NO** to disable this function.

2. Password Dataset Name

   The OS/EM password dataset consists of one statement per user ID, with the user ID in positions 1-8 and the password in positions 10-17. The user ID is defined to RACF and the password is the RACF password for that user ID. This dataset is user maintained via ISPF EDIT and should be RACF protected to limit access to authorized users.

   Use the file attributes: RECFM=FB,LRECL=80,BLKSIZE=0, to allocate the password dataset.

   The default password dataset name is SYS1.RACFPASS.

   Note: The User ID that is set in the password dataset has to be defined to RACF, and should have its password set up as "PASSWORD NOINTERVAL" in order to insure that the User ID password never expires.

3. Delete or Load Password

   Requests that the OS/EM password dataset be deleted, loaded or reloaded.

4. Add Password to Jobs

   Jobs sent over a JES network require password information be present on the jobcard. If you would like OS/EM to check for passwords and insert them if missing, enter **YES**.

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5. Replace ???????? with Password

   OS/EM can check for question marks on a jobcard and, if found, replace them with the user's password. This allows jobcards to be stored in an unprotected dataset, submitted for execution, and still prevent others from learning a user's password.

6. Allow Surrogate Password Processing

   Entries for Jobnames, Started Tasks, and TSO Users specify that password insertion processing is to be active for jobs submitted by other jobs.

   Enter **YES** to enable processing.

   Enter **NO** to disable processing.

7. Command Line

   An optional list of names can be specified which will limit password checking to the named job, STC, or user. If this list is omitted, all STCs jobs or users will have passwords added to the jobs they submit.

   Enter **JOB**, **STC** or **TSU** on the command line to access the name lists.

   Started task names, job names, and TSO user IDs may be specified with mask characters:

Job Name Masks

The following table shows the allowable mask characters:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

When a selection is made, the next panel will reflect your choice and the verbiage on the panel will also reflect your choice. In Figure 152, the choice was STC and the panel verbiage reflects STC. The same panel will appear for the other choices, JOB and TSU, but the verbiage will be different.

```
OS/EM -------------------- STC NAME LIST ------------------------ Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

(CMD = (A)dd (D)elete)
CMD                  STC Name
 '                   CONTROLM
 '                   TMON8DLS
 '                   UCC7-
****************************** Bottom of data ********************************
```

Figure 152. Job Name List - STC

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Surrogate Password Use

The intended use of this function is to supply passwords to jobs submitted by started tasks, TSO users, or other batch jobs so that these jobs can properly access RACF protected datasets. Your installation might, for example, have a job scheduling system installed. If you run it as a started task, and name it via this command, jobs which this scheduling system submits would be eligible to have passwords added to the JOB statement.

This can avoid some audit and operational exposures associated with every job submitted by the Scheduling System having the highest level of access that is required for one job or system like system backups which require RACF OPERATION privilege.

The password will be added if the submitted job's JOB statement has a USER=userid parameter that matches a USER ID in the OS/EM password dataset.

Typically, you would define one or more user IDs that represent your production jobs. These user IDs would have RACF access to production datasets. Jobs which your scheduling system submits would have a JOB statement that included the USER=userid parameter. The OS/EM password dataset would include statements with these user IDs and their associated RACF passwords. When such jobs are submitted, the appropriate password would be added.

You can create as many user IDs as are necessary within your installation.

The OS/EM password dataset consists of one statement per user ID, with the user ID in positions 1-8 and the password in positions 10-17. The user ID is defined to RACF and the password is the RACF password for that user ID. The dataset is user maintained and should be RACF protected to limit access to authorized users only.

It is your responsibility to keep this password dataset current and correct. OS/EM will use whatever password is indicated for the user ID. If the password is not correct for the user ID, the submitted job will fail with a password violation.

Note: To keep the password dataset maintenance to a minimum, the RACF password for each user ID you define should be specified as NEVER CHANGE.

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Sysout Extensions

The Sysout Extension Control function of OS/EM allows you to give extensions to jobs that go over the line limit defined on an OUTLIM JCL parameter, or the JES2 initialization parameters ESTLNCT, ESTPAGE or ESTBYTE. The controls can be selected based on the jobname, program name, job class and/or message class. It may also be controlled by RACF resource.

There may be up to 32 different extension groups, and you may weight the different classes/names to help the selection of the group which will be used.

```
OS/EM ---------------- SYSOUT EXTENSION CONTROLS ---------------- Version 6.1
SELECTION ===>


               1  Control by JES2 Parms         ( current subsystem: JES2     )

               2  Control by OUTLIM parameter
```

Figure 153. Sysout Extension Controls Menu

Select either **Control by JES2 Parms** or **Control by OUTLIM parameter** to get to the entry panel.

Control by JES2 Parms

```
OS/EM -------------- JES2 SYSOUT EXTENSION CONTROLS ------------- Version 6.1
COMMAND ===>                                                SCROLL ===> CSR
&                                                                        M
 Extension Controls Active:  YES                                         S
 RACF Resource Name:         SYSOUT.EXTEND                               G
 RACF logging:               NORMAL           (Normal/None)            C    C
                                                                       L    L
            ---- Extension ----   WTO When   WTOR After       J    P    A    A
            Lines  Pages  Bytes   Granted     How Many        O    G    S    S
 RACF:      5000   11     11000     YES          __           B    M    S    S
 Defaults:  10000  20     99999     YES          __
S(elect for update)                           Weight: (1234)  1    2    3    4
S  Ext Active                                                 - Active Lists -
_  1     Y  1000   33     _____     YES          3           INC  INC  INC  INC
_  2     Y  9999   _____  _____     YES          __          INC
_  3     N  _____  _____  _____     ___          __
_  4     N  _____  _____  _____     ___          __
_  5     N  _____  _____  _____     ___          __
_  6     N  _____  _____  _____     ___          __
_  7     N  _____  _____  _____     ___          __
_  8     N  _____  _____  _____     ___          __
_  9     N  _____  _____  _____     ___          __
_  10    N  _____  _____  _____     ___          __
_  11    N  _____  _____  _____     ___          __
```

Figure 154. JES2 Sysout Extension Controls

Field entry is as follows:

1. Extension Controls Active

   Enter **YES** to enable JES2 Sysout Extensions, or **NO** to disable them.

2. RACF Resource Name

Enter the resource name that has been defined to RACF for extension control. This name must be defined in the general resource FACILITY class for RACF and CA-ACF2 or the IBMFAC class for CA-Topsecret. Users who will be granted extensions must be given READ access to this profile.

Note: This resource is only checked if there are no matches with the selection groups defined below. This includes the DEFAULT group. Therefore if you want to control Sysout Extensions via your Security Manager the DEFAULT group must be left blank.

3. RACF Logging

   Enter **NORMAL** to have RACF logging, or **NONE** to turn off logging.

4. The following fields are used for RACF control, defaults and for the 32 possible selection groups.

   Note: If a job does not match any selection group and there is no DEFAULT, and you have not specified a RACF resource name, the job will use the values defined in your JESPARMS member.

```
             ---- Extension ----   WTO When  WTOR After
             Lines  Pages  Bytes   Granted    How Many
 RACF:       5000_  11___  50000     YES        15
 Defaults:   10000  20___  99999     YES        50
S  Ext Active
_  1     Y  15000  30___  99999     YES        5_
_  32    N  _____  _____  _____     ___        __
```

5. Extension Lines

   Enter the number of lines that the job will be given each time an extension is granted.

6. Extension Pages

   Enter the number of pages that the job will be given each time an extension is granted.

7. Extension Bytes

   Enter the number of bytes that the job will be given each time an extension is granted.

8. WTO When Extension Granted

   You may elect to have OS/EM send a message to the operator each time an extension is granted. Enter Yes or No in this field.

9. WTOR After How Many

   To ensure that a job doesn't get over looked while extensions are being granted, you may elect to have OS/EM issue a WTOR to force the operator to allow the extension to be granted.

   To update these fields for RACF or Defaults or one of the 32 selection groups, simply overtype the previously entered information.

10. Weight

    Each of the 32 selection groups may have selection lists attached to them. The different list types are: Job name, Program name, Job class and Message class. You must enter the weight that is to be given to each type of list. This weight will be used when a job matches more than one selection group. Enter 1, 2, 3 or 4 for each list type.

For job name and program name, you either specify the exact name or use a name mask.

Job classes and Message classes may be entered as individual classes or as a range, i.e. 1:4 specifies classes 1, 2, 3 and 4.

To update any of these lists, simply enter an **S** in the select column and press enter. Another panel will be presented to allow update of the selectors.

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```
OS/EM ------------------------ SELECTOR ENTRY - 1 --------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR

Enter Selector Types, either Include or Exclude
               Jobclass ===> INCLUDE     Jobname  ===> INCLUDE
               Msgclass ===> INCLUDE     Pgmname  ===> INCLUDE

 Line Cmds: (D)elete line, (I)nsert line

   Selector
     Type     Selector Names/Mask List
_  JOBCLASS   P
_  JOBNAME    TRSWJ- TRSMJ-
_  PGMNAME    TRP030 TRP190
_  MSGCLASS   V
****************************** Bottom of data ********************************
```

Figure 155. JES2 Sysout Extension Selectors

This panel is displayed each time one of the selection groups is selected for update.

Each list type may be either an include list or an exclude list. For example if you have an include list of job classes which contains 6:9, only jobs running in class 6, 7, 8 or 9 will be selected by this extension group. If it were an exclude list, jobs in class A through 5 would be eligible.

The allowable selector types are:

JOBCLASS Enter jobclass as individual classes or a class range. A range is two classes separated by a colon (:).

JOBNAME Jobnames may be entered as individual jobnames, or you may use jobname masks.

PGMNAME Program names may be entered as individual programs or you may use program name masks.

MSGCLASS Enter message classes as individual classes or a class range. A range is two classes separated by a colon (:).

For any of these lists, you may enter as many items as needed on a line separated with spaces. If you have more items than will fit on a single line, simply insert another line and use the same selector type.

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Control by OUTLIM parameter

```
OS/EM ---------------- SYSOUT EXTENSION CONTROLS ---------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

 Extension Controls Active:  YES
 RACF Resource Name:         OUTLIM.EXTEND                                 S
 RACF logging:               NORMAL           (Normal/None)              C    Y
                                                                         L    S
             Extension        WTO When       WTOR After       J    P    A    O
               Lines      Extension Granted   How Many        O    G    S    U
 RACF:         444              YES              4            B    M    S    T
 Defaults:     1000             YES              __
S(elect for update)                            Weight: (1234)  4    3    1    2
S  Ext Active                                                  - Active Lists -
_  1     Y     5200             YES              5           EXC  EXC  INC  INC
_  2     _     _____            ___              __
_  3     _     _____            ___              __
_  4     _     _____            ___              __
_  5     _     _____            ___              __
_  6     _     _____            ___              __
_  7     _     _____            ___              __
_  8     _     _____            ___              __
_  9     _     _____            ___              __
_  10    _     _____            ___              __
```

Figure 156. Sysout Extension Controls

Field entry is as follows:

1. Extension Controls Active

   Enter **YES** to enable Sysout Extensions, or **NO** to disable them.

2. RACF Resource Name

   Enter the resource name which has been defined to RACF for extension control. This name must be defined in the general resource FACILITY class for RACF and CA-ACF2 or the IBMFAC class for CA-Topsecret. Users who will be granted extensions must be given READ access to this profile.

3. RACF Logging

   Enter **NORMAL** to have RACF logging, or **NONE** to turn off logging.

4. The following fields are used for RACF control, as defaults and for the 32 possible selection groups.

```
                Extension        WTO When       WTOR After
                  Lines      Extension Granted   How Many
     RACF:        1500_            YES              15
     Defaults:    1000_            NO_              15
    S  Ext Active
    _  1     Y    15000            YES              5_
    _  32    N    _____            ___              __
```

5. Extension Lines

   Enter the number of lines that the job will be given each time an extension is granted.

6. WTO When Extension Granted

   You may elect to have OS/EM send a message to the operator each time an extension is granted. Enter Yes or No in this field.

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7. WTOR After How Many

   To ensure that a job doesn't get over looked while extensions are being granted, you may elect to have OS/EM issue a WTOR to force the operator to allow the extension to be granted.

   To update these fields for RACF or Defaults, simply overtype the previously entered information.

8. Weight

   Each of the 32 selection groups may have selection lists attached to them. The different list types are: Job name, Program name, Job class and Sysout class. You must enter the weight that is to be given to each type of list. This weight will be used when a job matches more than one selection group. Enter 1, 2, 3 or 4 for each list type.

For job name and program name, you either specify the exact name or use a name mask.

Job classes and SYSOUT classes may be entered as individual classes or as a range, i.e. 1:4 specifies classes 1, 2, 3 and 4.

To update any of these lists, simply enter an **S** in the select column and press enter. Another panel will be presented to allow update of the different lists.

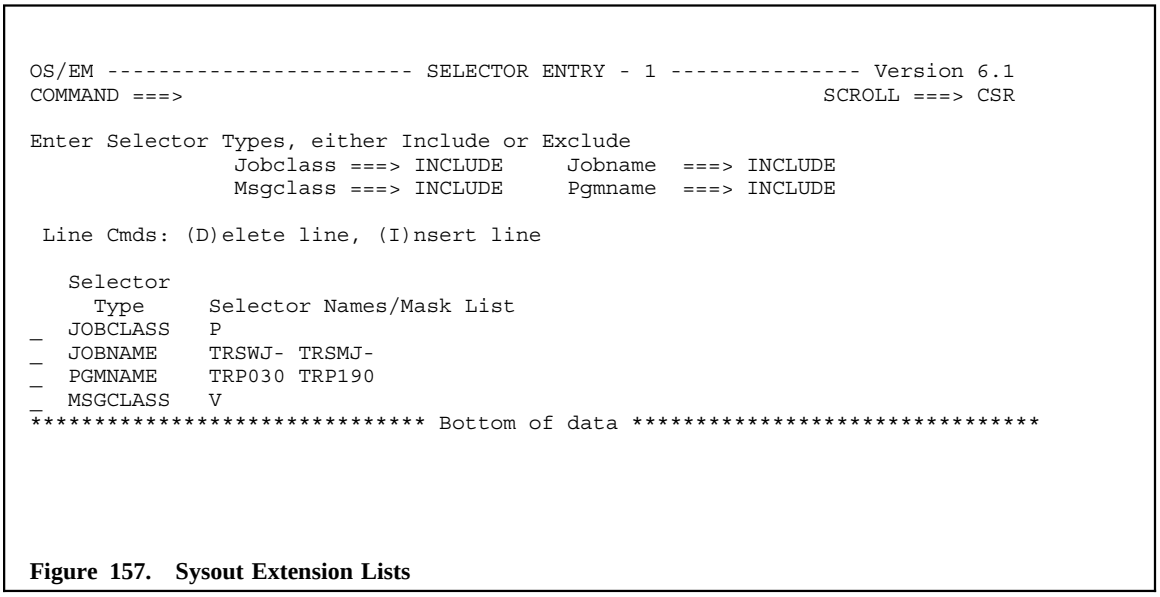

Figure 157. Sysout Extension Lists

This panel is displayed each time one of the selection groups is selected for update.

Each list type may be either an include list or an exclude list. For example if you have an include list of job classes which contains 6:9, only jobs running in class 6, 7, 8 or 9 will be selected by this extension group. If it were an exclude list, jobs in class A through 5 would be eligible.

The allowable selector types are:

JOBCLASS Enter jobclass as individual classes or a class range. A range is two classes separated by a colon (:).

JOBNAME Jobnames may be entered as individual jobnames, or you may use jobname masks.

PGMNAME Program names may be entered as individual programs or you may use program name masks.

SYSOUT Enter sysout classes as individual classes or a class range. A range is two classes separated by a colon (:).

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For any of these lists, you may enter as many items as needed on a line separated with spaces. If you have more items than will fit on a single line, simply insert another line and use the same selector type.

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TSO Logoff Statistics

TSO Logoff Statistics specifies that OS/EM will display TSO session statistics at logoff time.

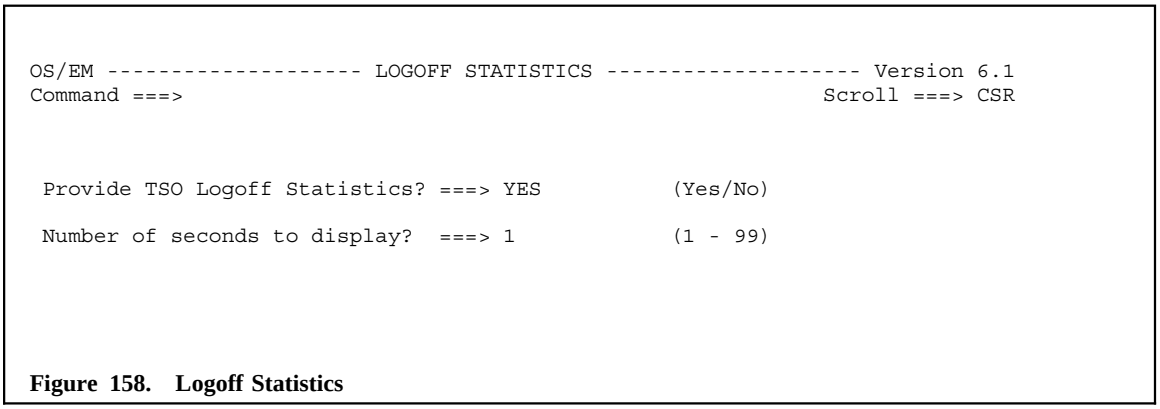

Figure 158. Logoff Statistics

Field entry is as follows:

1. Provide TSO Logoff Statistics

   To enable TSO Logoff Statistics enter **YES**, to disable, enter **NO**.

2. Number of seconds to display

   Enter the **number of seconds** to display the TSO Logoff Statistics. Valid entries are **1 to 99**. This field is required if you entered YES above.

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Verify User Defined to RACF

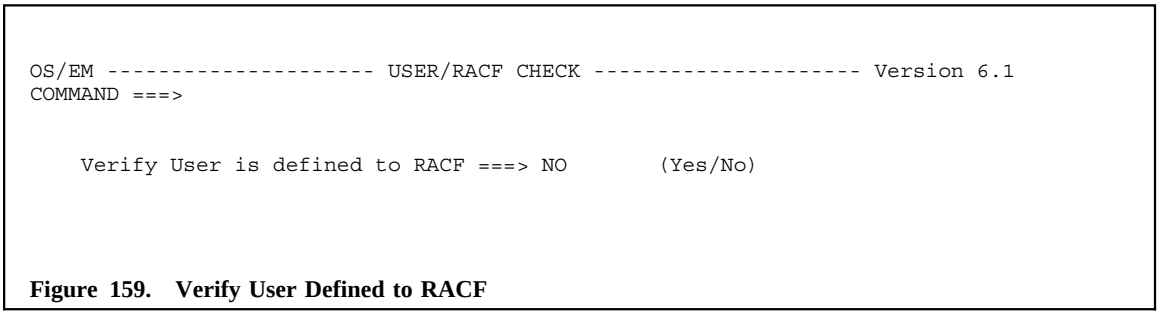

Figure 159. Verify User Defined to RACF

Field entry is as follows:

1. Entering **YES** specifies that a check is done to ensure that the user is defined to your security system (RACF, CA-TOPSECRET, CA-ACF2).
2. Specifying **NO** for this field disables this option.

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Verify User ID with Jobname

USERID/JOBNAME check specifies that the first characters of the jobname matches the TSO USER ID. The check is limited to the classes specified.

```
OS/EM ------------------- USERID/JOBNAME CHECK ------------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

   Verify Jobname Starts With User ID ===> YES  (Yes/No/Blank)
     Number of characters to compare  ===>      (1 to 7 or blank)

   RACF Resource name ===> USERID.BYPASS        (exp: IKJEFF10.RACF)
   RACF Logging       ===> NONE                 (None/Normal)

   Enter class or class range below to limit verification (exp: A C:F)

  (CMD = (A)dd; (D)elete)
CMD     Class
 '       A:9
 '       STC
 '       TSU
****************************** Bottom of data ********************************
```

Figure 160. Verify UserID with Jobname

Field entry is as follows:

1. VERIFY JOBNAME

   Enter **YES** to cause OS/EM to verify User ID to Jobnames. Enter **NO** to turn this option off.

2. Number of characters to compare

   Enter the number of characters of the User ID that will be used to compare it to the jobname. If blank, the full length of the User ID will be used.

3. RACF Resource name

   Enter the name of the RACF resource which has been defined to control this option. Leave blank to have control strictly by class.

   This resource must be defined in the general resource FACILITY class for RACF and CA-ACF2 or IBMFAC for CA-Topsecret. Users must have READ access to this profile to allow job submission using a job name not matching their TSO ID. Only job classes specified below will be security checked.

4. RACF Logging

   Enter **NORMAL** to have RACF logging, or **NONE** if logging is not required.

5. Add or Delete

   To make the check universal enter the class as **A:9**.

   To enter a class, type an **A** in the CMD field and overtype the class.

   To delete a previously entered class, type a **D** in the CMD field of the class to be deleted.

   If a security resource name is supplied a RACHECK will be performed for any job submitted in the specified class(es).

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Job Routing Controls

Description

The optional **Job Routing** function allows job routing between CPU's in a JES2 MAS based on defined resource names and their availability. Use the $QA and $QD commands to manage resource names on each system running OS/EM Job Routing (See “Appendix F. JES2 Commands” on page F-1) The routing may be controlled by JCL statements placed within the JOBLIB member, or by specifying routing control information through the OS/EM Job Routing Controls function.

Note: There may be a maximum of **127** routes per job. This is a combination of JCL statements and OS/EM automated routing.

This function may also be used to change the Workload Manager service class that would normally be assigned to a job, override the specified jobclass or priority specified on the jobcard and change the Workload Manager scheduling environment.

Note: If a valid JES2 NODE is found on a ***/*ROUTE XEQ nodename*** card the job is routed to the specified node **before** OS/EM has access to the job. Therefore **no** OS/EM changes will be processed on the system where the job was submitted. If OS/EM job routing is active on the node where the job was routed, OS/EM changes will be effective there.

The $HASP message numbers produced by the OS/EM implementation of the Mellon Modifications may also be changed. This feature is provided for customers who would like to see the original Mellon message numbers. Although Mellon had originally reused IBM message numbers, the OS/EM implementation tries to avoid this where possible. This feature allows you to specify the message number you want to appear for selected messages.

Note: The Job Routing Communications dataset must be on DASD shared by each JES within the MAS, and must be a unique dataset for each MAS or independent system running Job Routing. Failure to have unique datasets will result in unpredictable results/failures. Additionally the Job Routing function must be enabled on each LPAR within a MAS concurrently. Failure to do so will result in jobs not being allowed to execute on LPARs where Job Routing is active if they have been through the interpreter on a LPAR without Job Routing. Conversely, LPARs within the MAS without Job Routing active may select jobs for execution without the specified resources.

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Job Routing/Classing Controls Menu

```
OS/EM ----------- JOB ROUTING/CLASSING CONTROLS - JES2 ---------- Version 6.1
SELECTION ===>


                        1  System Level Controls
                        2  JECL Defaults
                        3  Message Number Substitution
                        4  Resource Routing Groups

                        5  Change Jobclass/Priority Groups
                        6  Change Scheduling Environment Groups
                        7  Change SRVCLASS Groups
                        8  Change XEQ Node Groups

                        9  Set JES name / currently: JES2
```

Figure 161. Job Routing/Classing Controls Menu

Each of these paths is presented in the following sections:

1. System Level Controls (see “System Level Controls” on page 5-180)
2. JECL Defaults (see “JECL Defaults” on page 5-182)
3. Message Number Substitution (see “Message Number Substitution” on page 5-184)
4. Resource Routing Groups (see “Job Routing Resource Groups” on page 5-186)
5. Change JOBCLASS Groups (see “Change Jobclass/Priority Groups” on page 5-190)
6. Change SCHEDENV Groups (see “Change Scheduling Environment Groups” on page 5-192)
7. Change SRVCLASS Groups (see “Change SRVCLASS Groups” on page 5-194)
8. Change XEQ Node Groups (see “Change XEQ Node Groups” on page 5-196)
9. Set JES name (see “Set JES2 Name” on page 8-1)

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System Level Controls

This panel allows you to completely turn off the Job Routing Controls without deleting any of the control information previously entered. You also specify the name of the dataset containing your resource name information here.

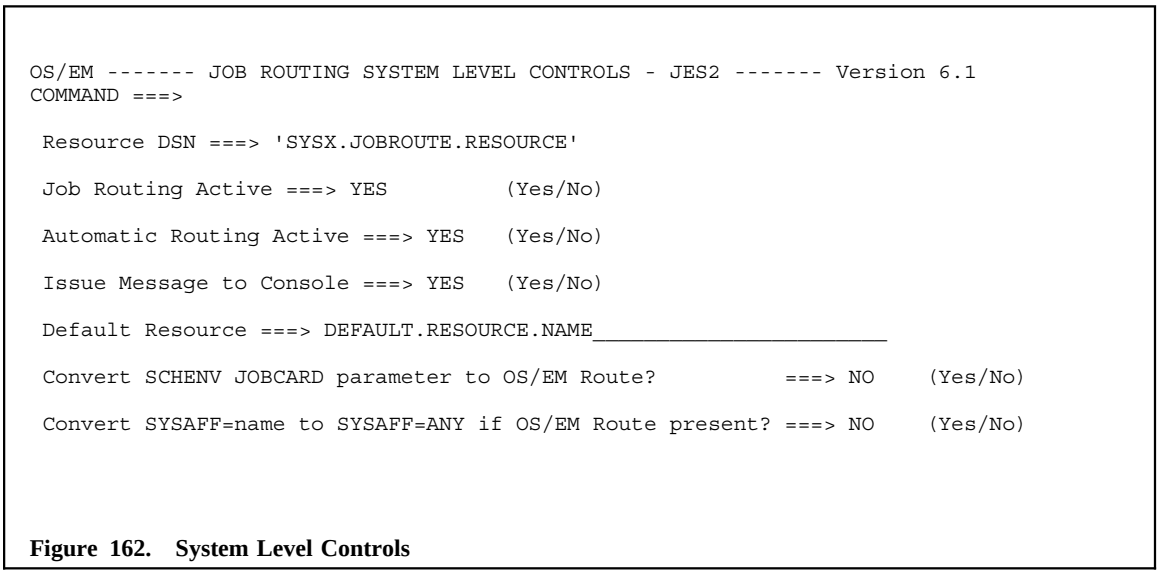

Figure 162. System Level Controls

Data entry is as follows:

1. Job Routing Active

2. Resource DSN

   Enter the dataset name of the sequential file which will store the resource name information. This dataset must be located on a shared DASD volume that can be accessed by all LPARs in the MAS.

   This dataset contains 32 fixed length records - one record for each system within the MAS. Each record is made up of a 4 byte header plus 45 bytes for each active resource on the system.

   Allocate a Resource dataset with the following characteristics:

   ```
   RECFM=F,LRECL=nnnnn,BLKSIZE=nnnnn,DSORG=PS,SPACE=(nnnnn,(32),,CONTIG)
   ```

   where nnnnn is the record / block size. This is calculated with the following algorithm:

   ```
   45 * Max_Number_Resource_Entries + 4
   ```

   The minimum record length is 4505 (allowing a maximum of 100 active resources per system) and the maximum record length is 32719 (737 active resources). It is recommended that the maximum value is used since the dataset is very small and will not increase in size.

   Only allocate 32 blocks for the primary extent and zero for the secondary allocation. Any allocation exceeding this will simply be wasted allocated space.

3. Job Routing Active

   Specify either **YES** or **NO** here.

   No OS/EM routing functions will be available unless this field is marked YES.

4. Automatic Routing Active

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Specify either **YES** or **NO** here.

If you enter NO but enter YES for Job Routing, only routing via JECL will be active. This field controls automatic routing as well as the ability to change various routing information.

5. Issue Message to Console

   Specify either **YES** or **NO** here.

   Enter **YES** to have OS/EM Job Routing messages to be sent to the console. Messages will be issued each time a /*ROUTE JECL statement is processed or an automatic route is assigned.

   Note : All Job Routing messages are always written to the JES2 job log regardless of the setting of this control parameter.

6. Default Resource

   To have a resource name attached to any job which either does not have an OS/EM routing card (/*ROUTE XEQ resource) in the JCL or does not match an automatic routing group simply enter the **resource name** here.

   To disable a default resource previously specified, simply blank out this field.

7. Convert SCHENV JOBCARD parameter to OS/EM Route?

   Specifying **YES** will cause OS/EM to scan for the keyword SCHENV= on the JOBCARD statement and remove it. It then inserts an OS/EM Job Routing JECL statement using the scheduling environment name just removed as the resource name.

   Note: If you are using OS/EM Job Routing to assign a Scheduling Environment based on some selection criteria it will still be assigned, as that processing occurs after any original SCHENV keyword has been converted to a route statement. This means that your jobs could end up having a route statement with the original scheduling environment name as the resource and a SCHENV keyword generated based on your selection criteria.

8. Convert SYSAFF=name to SYSAFF=ANY if OS/EM Route present?

   Specifying **YES** will cause OS/EM to set a job's system affinity (SYSAFF) to **ANY**, if, and only if, the job has been assigned one or more OS/EM Job Route resources. The job route resources may be from either JECL control cards (/*ROUTE XEQ resource) or automatically generated.

   Note: You may use both SCHENVCONVERT and SYSAFFANY. The system affinity change occurs after any schedule environments have been replaced with ROUTE statements.

   Additional notes:

   a. It is highly recommended that this option be activated if Resource Routing is being utilized.

   b. JES2 will continue to use the original SYSAFF specification to determine where JCL conversion takes place. Setting the SYSAFF to ANY occurs after JCL conversion and prior to queuing the job for execution.

   c. The independent mode status is not affected by this option. In other words, if the job routing condition is met, a job with SYSAFF=(CPU1,IND) would be changed to SYSAFF=(ANY,IND). In this way systems can be placed into independent mode and still participate fully in resource routing.

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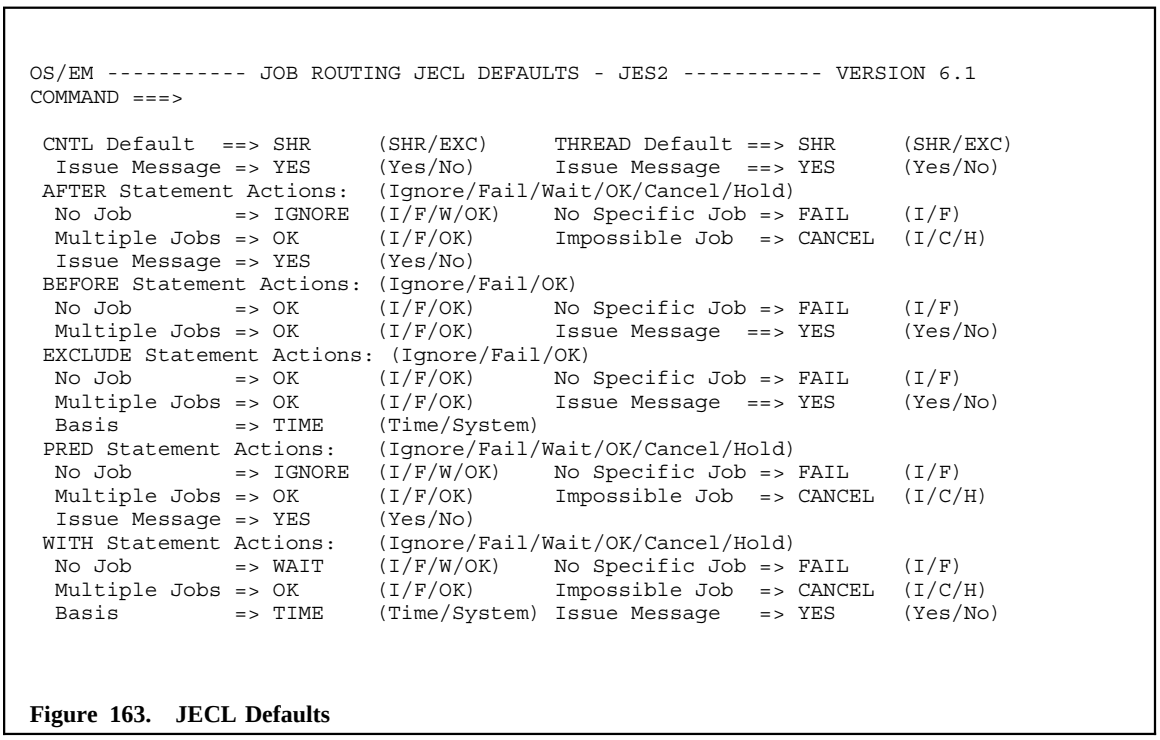
JECL Defaults

This option allows you to specify system wide defaults for the various JECL statements used for job routing and scheduling.

See “Appendix G. JECL Statements for Job Routing” on page G-1 for information about the supported JECL statements.



```
OS/EM ----------- JOB ROUTING JECL DEFAULTS - JES2 ----------- VERSION 6.1
COMMAND ===>

 CNTL Default  ==> SHR     (SHR/EXC)     THREAD Default ==> SHR     (SHR/EXC)
  Issue Message => YES     (Yes/No)      Issue Message  ==> YES     (Yes/No)
 AFTER Statement Actions:  (Ignore/Fail/Wait/OK/Cancel/Hold)
  No Job        => IGNORE  (I/F/W/OK)    No Specific Job => FAIL    (I/F)
  Multiple Jobs => OK      (I/F/OK)      Impossible Job  => CANCEL  (I/C/H)
  Issue Message => YES     (Yes/No)
 BEFORE Statement Actions: (Ignore/Fail/OK)
  No Job        => OK      (I/F/OK)      No Specific Job => FAIL    (I/F)
  Multiple Jobs => OK      (I/F/OK)      Issue Message  ==> YES     (Yes/No)
 EXCLUDE Statement Actions: (Ignore/Fail/OK)
  No Job        => OK      (I/F/OK)      No Specific Job => FAIL    (I/F)
  Multiple Jobs => OK      (I/F/OK)      Issue Message  ==> YES     (Yes/No)
  Basis         => TIME    (Time/System)
 PRED Statement Actions:   (Ignore/Fail/Wait/OK/Cancel/Hold)
  No Job        => IGNORE  (I/F/W/OK)    No Specific Job => FAIL    (I/F)
  Multiple Jobs => OK      (I/F/OK)      Impossible Job  => CANCEL  (I/C/H)
  Issue Message => YES     (Yes/No)
 WITH Statement Actions:   (Ignore/Fail/Wait/OK/Cancel/Hold)
  No Job        => WAIT    (I/F/W/OK)    No Specific Job => FAIL    (I/F)
  Multiple Jobs => OK      (I/F/OK)      Impossible Job  => CANCEL  (I/C/H)
  Basis         => TIME    (Time/System) Issue Message   => YES     (Yes/No)
```

Figure 163. JECL Defaults

Field entry is as follows:

- CNTL Default
- THREAD Default

  The **CNTL** and **THREAD** statements work identically. Each may have its own default action. To have exclusive control of a resource or dataset specified with this statement, use the **EXC** default setting. To allow shared access as the default, enter **SHR**.

Each of the remaining JECL statements are processed in the same way. The **Impossible Job** parameter is not available for the **BEFORE** or **EXCLUDE** statements.

- No Job

  This parameter allows you to specify the default action to be performed if the specified job is not in the execute queue. The available options are **ignore**, **fail**, **wait** or **OK**

- No Specific Job

  This parameter allows you to specify the action to be taken if the specific job (job name with job number) is not in the execute queue. The available options are **ignore** or **fail**.

- Multiple Jobs

  This parameter allows you to specify the default action to be performed if there are multiple matching job names in the system. The available options are **ignore**, **fail** or **OK**.

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- Impossible Job

  This parameter allows you to specify the default action to be taken if the specific job name and job number specified has already left the execution queue. i.e. the request of **AFTER**, **PRED** or **WITH** is impossible to fulfill. The available options are **ignore**, **cancel** or **hold**.

The meanings of the different options are:

- Cancel

  Indicates that the job will be cancelled. i.e. **$PJOBxxxx**.

- Fail

  Indicates that the job is to be failed by passing a return code of 12 back to JES2.

- Hold

  Indicates that the job will be placed on hold. Operator intervention will be required to release or cancel the job.

- Ignore

  Indicates that the card is to be treated as a comment.

- OK

  Indicates that the statement will apply to all jobs with the specified jobname.

- Wait

  Indicates that the job should wait for the specified jobname to be read into the system.

Issue Message (Yes / No)

Enter **YES** to have OS/EM Job Routing messages to be sent to the console. Messages will be issued each time that the related JECL statement is processed.

Note : All Job Routing messages are always written to the JES2 job log regardless of the setting of this control parameter.

Basis (Time/System)

This parameter applies to the WITH and EXCLUDE control statements. Valid Basis values are:

TIME The job will be run on any eligible member of the MAS once the WITH / EXCLUDE condition is satisfied.

In the case of the WITH statement, the job will execute on any member of the MAS when the named job is executing in the MAS.

With the EXCLUDE statement, the job will run on any eligible member of the MAS only when the named job is not executing in the MAS.

SYSTEM The job will execute on specific MAS member(s).

In the case of the WITH statement, the job will execute on the same MAS member where the named job is executing.

With the EXCLUDE statement, the job will be allowed to execute on any eligible member of the MAS where the named job is **NOT** executing (the job will not wait for the named job to terminate unless there is no eligible MAS member).

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Message Number Substitution

This function allows the user to set the message numbers for the standard OS/EM HASP messages. This could be desirable under the following circumstances:

- Existing user exits exist that issue HASP message numbers that conflict with the OS/EM messages.
- Provide HASP message number compatibility with the SHARE Mellon Modifications.

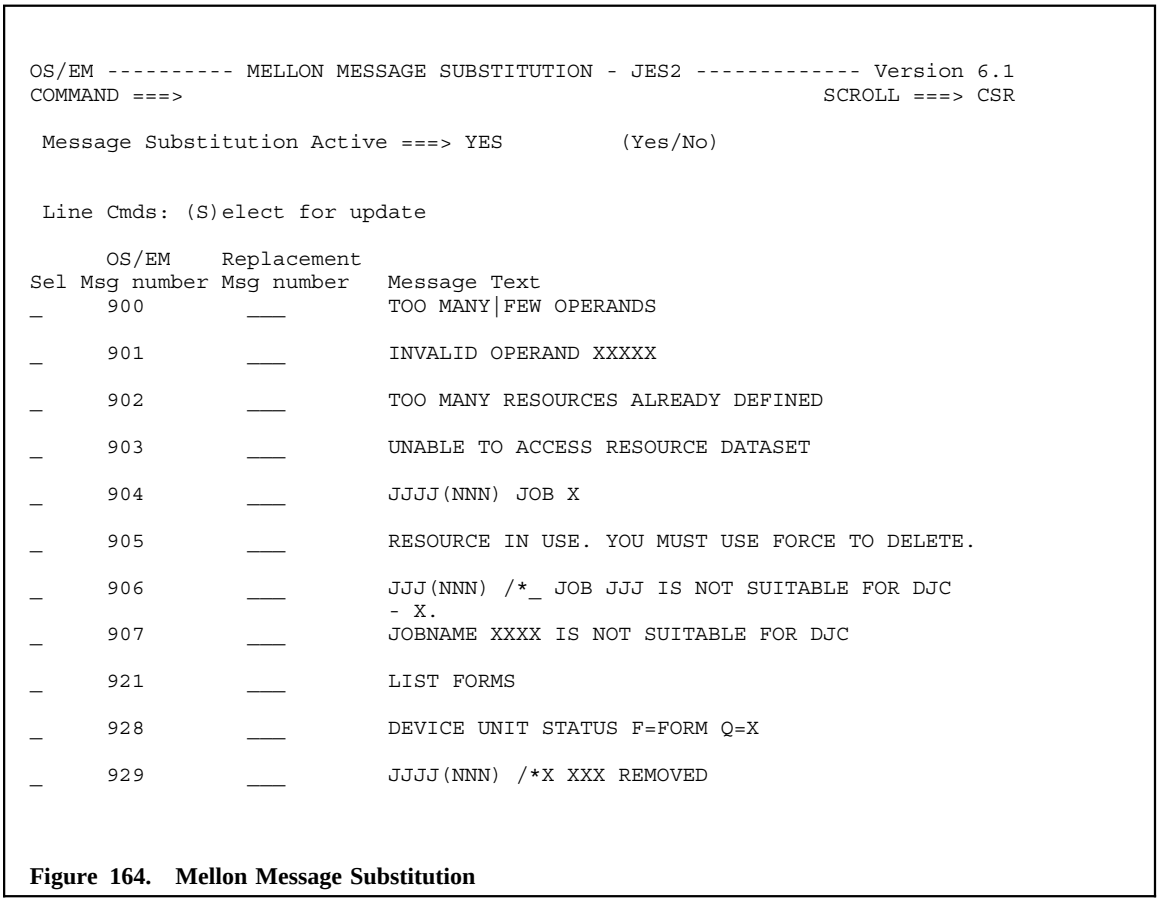

Figure 164. Mellon Message Substitution

When this function is selected a scrollable list of the OS/EM HASP messages is displayed. The message text displayed is not available for update, it is simply to aid in the identification of the message numbers to change.

The input fields are as follows:

- Message Substitution Active

  Enter **YES** or **NO** here. Entering NO allows you to turn message substitution off without having to modify each message previously defined.

- Sel

  Enter an **S** in the Sel column for any message number to be overridden.

- Replacement MSG number

  Tab to the **Replacement MSG number** column and enter the three digit number to be used in place of the OS/EM message number.

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To revert back to the OS/EM number, simply blank out any previously entered replacement number.

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Job Routing Resource Groups

This function allows you to specify up to 999 different sets of routing rules. The 999 rule sets are shared between normal resource routing, changing jobclass/priority, changing scheduling environments, changing the service class or changing the execution node.

These rules are searched sequentially and attached to the job in the order processed.

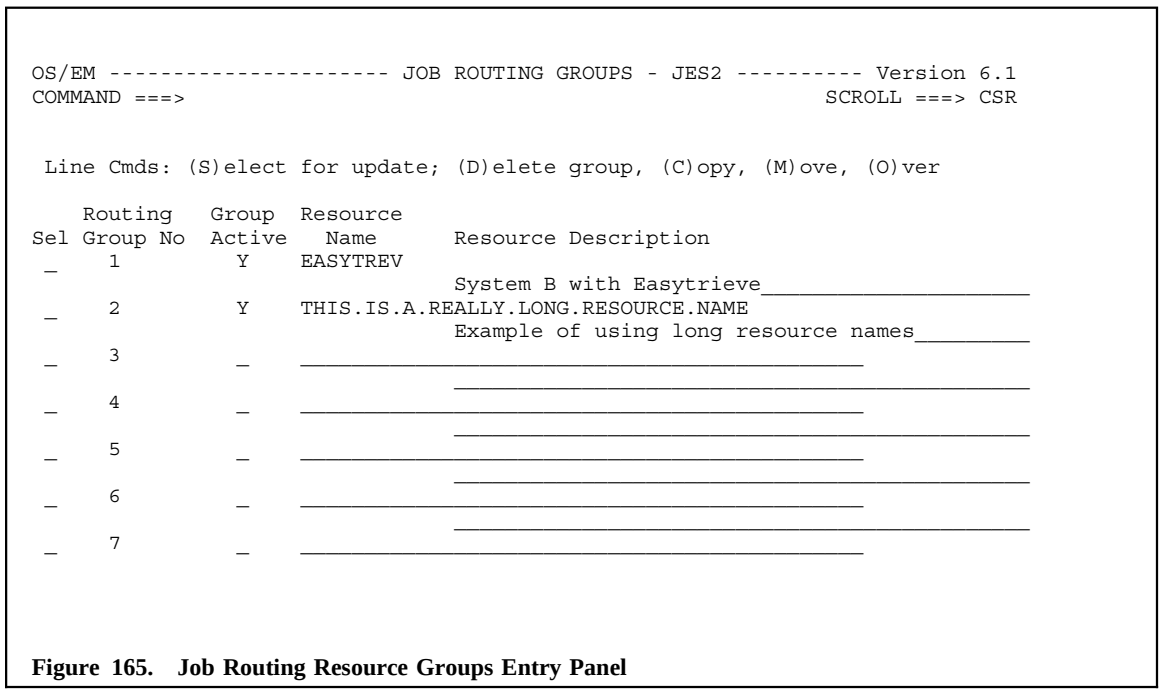

Figure 165. Job Routing Resource Groups Entry Panel

There are 5 line commands available:

1. (S)elect for update

   To add or change the selection criteria for a resource, you must enter an **S** in the **Sel** column, then press enter. Another window will open where you can specify the selector type (such as DDNAME, UNITNAME, RACFGROUP), and the selector names or masks. (See Figure 166 on page 5-187 for an example of this panel.) Resource names may be up to 44 characters long.

2. (D)elete Group

   To clear a resource group, enter a **D** in the **Sel** column, then press enter. When you use this command and there are selection criteria attached to the resource, another panel will be displayed showing the selection criteria and warning you that they will be deleted if you continue. Press PF3 (end command) to process the deletion, or enter **CANCEL** on the command line to cancel the delete process. (See Figure 167 on page 5-189 for an example of this panel.)

3. (C)opy

   Use the copy line command along with the **(O)ver** line command to copy an existing resource group over an empty group. All of the existing selection criteria is copied along with the resource group.

4. (M)ove

   Use the move line command along with the **(O)ver** line command to move an existing resource group over an empty group. All of the existing selection criteria is moved along with the resource group.

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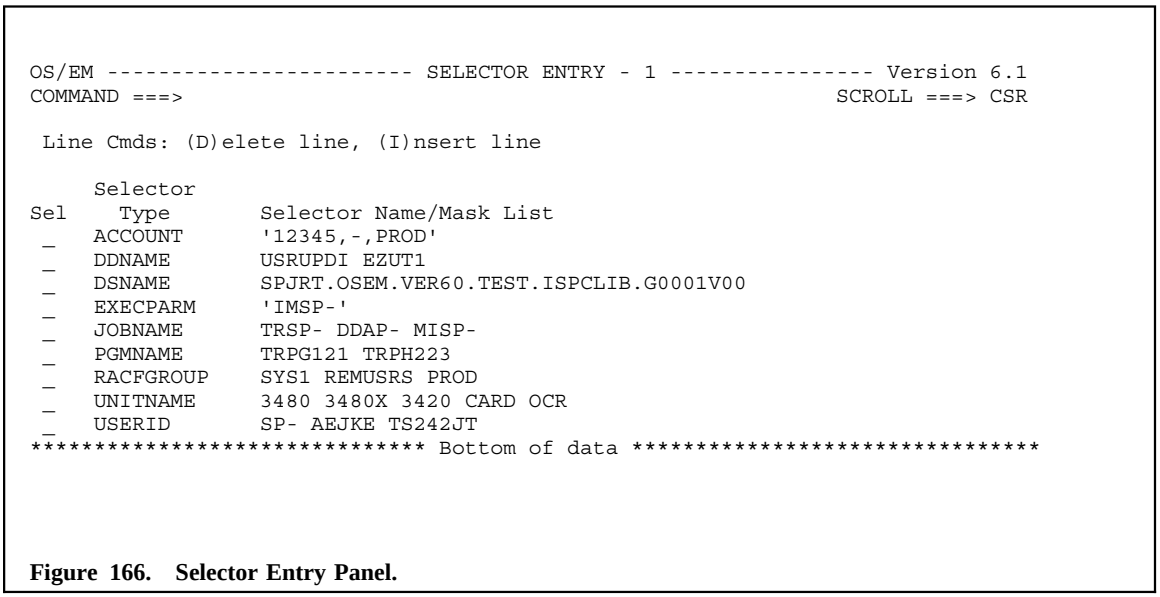

Figure 166. Selector Entry Panel.

This panel allows you to enter the selection criteria for a resource group. You may enter the following types of items:

ACCOUNT The **account number** or mask on the JOBCARD.

DDNAME The **DDNAME** or mask of any DD statement.

DSNAME A **dataset name** or mask.

EXECPARM A **PARM** field or mask found on an EXEC statement.

JOBCLASS The **class** of the job.

JOBNAME A **job name** or mask.

JOBTIME Time value from jobcard. The time parameters are entered as MMMMMM.SS, where MMMMMM may be from 0 to 357,912 minutes and SS may be from 0 to 59 seconds.

JOBTIME may also be entered as a range by separating the beginning and ending values with a colon (:), i.e. 0.10:2.0 would specify a range beginning with zero minutes and 10 seconds to two minutes and zero seconds. Leading and trailing zeros may be dropped, i.e. the above could also be entered as .10:2 for ten seconds to two minutes.

MEMBER A **PDS member name** or mask found in a DD statement.

PGMNAME A **program name** or mask found on an EXEC statement.

RACFGROUP A **RACF group** or mask.

SCHENV The workload manager **scheduling environment**.

SERVCLS The workload manager **service class**.

SRCNAME The **user ID** or **job name** that submitted the job.

SRCPRGM The **program name** that submitted the job.

SRCTYPE The **source type**, either JOB, TSU or STC.

UNITNAME The **name of a unit** on a DD statement.

USERID The **user ID** associated with the job.

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Note: If JOBCLASS or SERVCLS is used for job routing, unpredictable results will occur if the class is changed after the job has been submitted.

Separate the names or masks with a space. You may enter as many names/masks as will fit on the line. To enter more items, simply insert another line and enter the same type.

Note: The selector types ACCOUNT and EXECPARM only allow use of one item. In other words if you wanted jobs with execution parms of 'IMSP-' and 'IMSD-' to be routed to the same system, you would have to code two separate selection groups, one for each parm.

Multiple names/masks within a selector type are considered to be **OR** conditions. That is, if any of them are matched the condition is satisfied. Specifying multiple selector types, however, is considered to be an **AND** condition. All selector types must be a match in order for the **resource name** to be assigned to the job.

For example, if the following entries were used:

```
    Selector
Sel   Type       Selector Name/Mask List
 _  DDNAME       SYSUT2 SPECIAL
 _  JOBNAME      TSYS- TDEV-
```

Then only those jobs which had jobnames beginning with TSYS **or** TDEV that **also** had a DDNAME of SPECIAL **or** a DDNAME of SYSUT2 in their JCL streams would be assigned that particular Resource Name.

On the other hand, if you only wanted TSYS jobs with a SYSUT2 DDNAME or only those TDEV jobs with a SPECIAL DDNAME to be assigned the Resource Name, you could code **two** Routing Groups and specify the same Resource Name for both.

```
      Routing   Group  Resource
 Sel Group No  Active   Name      Resource Description
  _    1         Y    RES_TEST
                                  TSYS jobs with DDNAME SYSUT2___
  _    2         Y    RES_TEST
                                  TDEV jobs with DDNAME SPECIAL__
  _    3         _    ____________________________________________
```

Routing group 1 would have selector entries like:

```
    Selector
Sel   Type       Selector Name/Mask List
 _  DDNAME       SYSUT2_____________________
 _  JOBNAME      TSYS-______________________
```

Routing group 2 would have selector entries like:

```
    Selector
Sel   Type       Selector Name/Mask List
 _  DDNAME       SPECIAL____________________
 _  JOBNAME      TDEV-______________________
```

In this way, TDEV jobs with a SYSUT2 DDNAME and TSYS jobs with a SPECIAL DDNAME would not be assigned the resource as they would in the first example.

There are two line commands available for this panel.

1. (D)elete line

   Use this line command to delete an invalid or obsolete line.

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2. (I)nsert line

   Use this line command to insert a blank line into the display. Then enter the resource type and the names/masks for that type.

   The display is sorted by selector type, so even if you insert a line at the end of the display, when next entered the panel will have been resorted.

```
OS/EM --------------- SELECTION DELETION CONFIRMATION - 1 -------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

 WARNING:  The following entries will be deleted if the Resource Group
           1       is deleted.

 Press PF3 or END to delete Resource Group and all selection entries,
 else, enter CANCEL to return without deleting group.

     Selection
       Type       Type Name/Mask List
     DDNAME       OUTFILM
     JOBNAME      MISPRDP
     UNITNAME     MISTAP
****************************** Bottom of data ********************************
```

Figure 167. Delete Warning Panel.

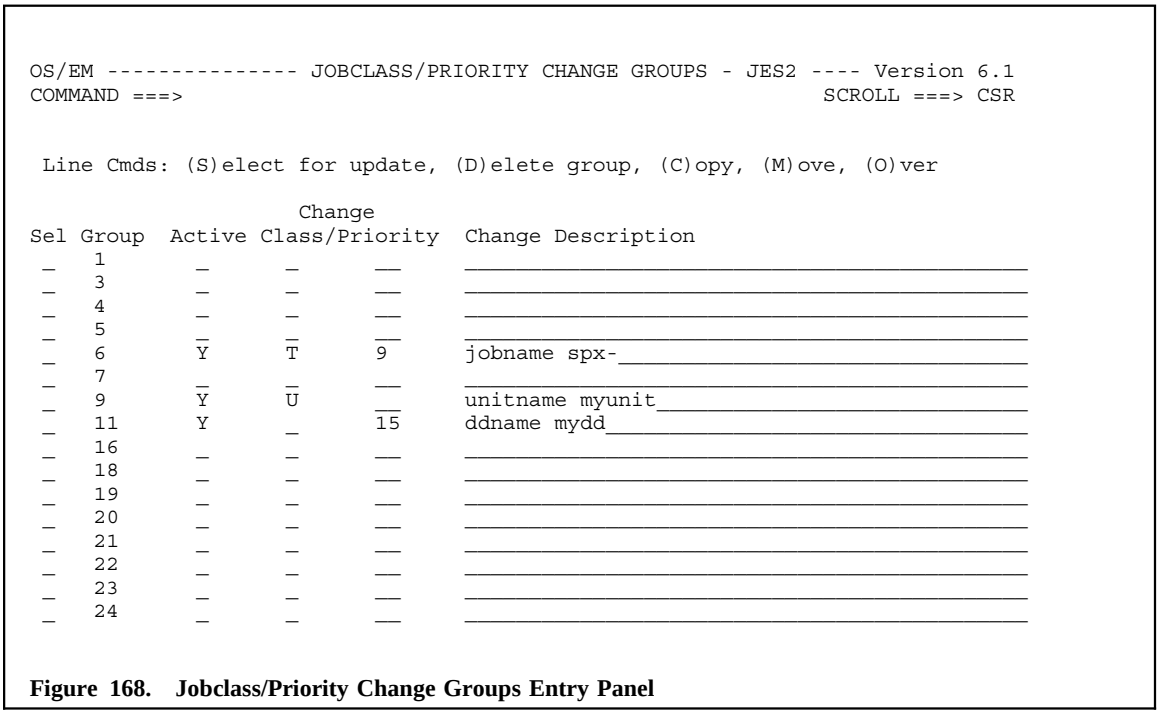
This panel will be displayed showing the selection criteria for a resource group before the group is deleted. If you are sure you want the group deleted, simply press the PF3 key or enter the **END** command. To continue without deleting the group, enter the **CANCEL** command.

Change Jobclass/Priority Groups

This function allows you to specify up to 999 different sets of rules to allow changing the Jobclass or priority parameter. The 999 rule sets are shared between normal resource routing, changing jobclass/priority, changing scheduling environments, changing the service class or changing the execution node.

The rules are processed sequentially and attached to the job in the order processed. Because of this the last matching rule will be the one that actually sets the jobclass and/or priority.

Note: You must enable **Automatic Routing**. See "System Level Controls" on page 5-180.



```
OS/EM --------------- JOBCLASS/PRIORITY CHANGE GROUPS - JES2 ---- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

 Line Cmds: (S)elect for update, (D)elete group, (C)opy, (M)ove, (O)ver

                      Change
Sel Group  Active Class/Priority  Change Description
 _   1       _      _      __     ____________________________________________
 _   3       _      _      __     ____________________________________________
 _   4       _      _      __     ____________________________________________
 _   5       _      _      __     ____________________________________________
 _   6       Y      T      9      jobname spx-_______________________________
 _   7       _      _      __     ____________________________________________
 _   9       Y      U      __     unitname myunit____________________________
 _   11      Y      _      15     ddname mydd________________________________
 _   16      _      _      __     ____________________________________________
 _   18      _      _      __     ____________________________________________
 _   19      _      _      __     ____________________________________________
 _   20      _      _      __     ____________________________________________
 _   21      _      _      __     ____________________________________________
 _   22      _      _      __     ____________________________________________
 _   23      _      _      __     ____________________________________________
 _   24      _      _      __     ____________________________________________
```

Figure 168. Jobclass/Priority Change Groups Entry Panel

The fields and their meanings are listed below:

- (S)elect for update

  To add or change the selection criteria for a resource, you must enter an **S** in the **Sel** column. Another window will open where you can specify the resource type (such as DDNAME, UNITNAME, RACFGROUP) and the resource names or masks. (See Figure 166 on page 5-187for an example of this panel.)

  If you are just changing the priority, leave the class field blank. Conversely, if you are just changing the class, leave the priority field blank.

- (D)elete group

  To clear a resource group, enter a **D** in the **Sel** column. When you use this command and there are selection criteria attached to the resource, another panel will be displayed showing the selection criteria and warning you that they will be deleted if you continue. Press PF3 (end command) to process the deletion, or enter **CANCEL** on the command line to cancel the delete process. (See Figure 167 on page 5-189 for an example of this panel.)

- (C)opy

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Use the copy line command along with the **(O)ver** line command to copy an existing resource group over an empty group. All of the existing selection criteria is copied along with the resource group.

- (M)ove

  Use the move line command along with the **(O)ver** line command to move an existing resource group over an empty group. All of the existing selection criteria is moved along with the resource group.

- Change Description Field

  To change or add a description, simply type into the field.

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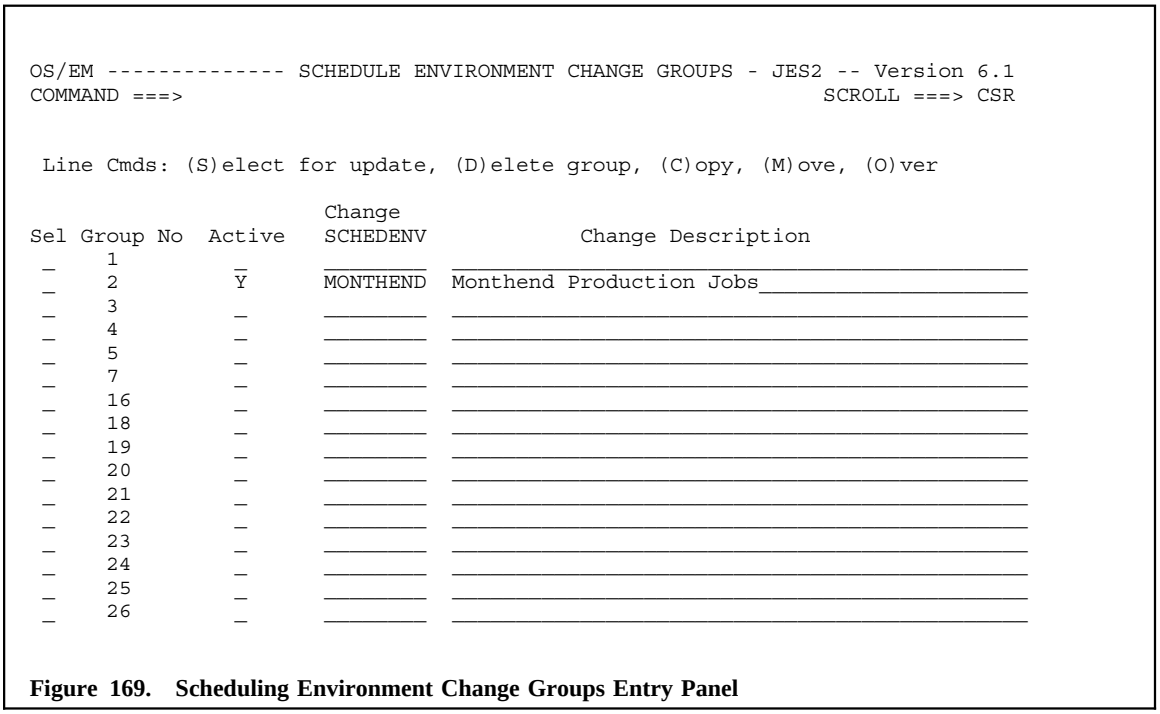
Change Scheduling Environment Groups

This function allows you to specify up to 999 different sets of rules to allow changing the Workload Manager SCHENV parameter. The 999 rule sets are shared between normal resource routing, changing jobclass/priority, changing scheduling environments, changing the service class or changing the execution node.

The rules are processed sequentially and attached to the job in the order processed. Because of this the last matching rule will be the one that actually sets the scheduling environment.

Note: You must enable **Automatic Routing**. See "System Level Controls" on page 5-180.



```
OS/EM -------------- SCHEDULE ENVIRONMENT CHANGE GROUPS - JES2 -- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

 Line Cmds: (S)elect for update, (D)elete group, (C)opy, (M)ove, (O)ver

                         Change
Sel Group No  Active     SCHEDENV            Change Description
 _    1          _       ________  ____________________________________________
 _    2          Y       MONTHEND  Monthend Production Jobs_____________________
 _    3          _       ________  ____________________________________________
 _    4          _       ________  ____________________________________________
 _    5          _       ________  ____________________________________________
 _    7          _       ________  ____________________________________________
 _    16         _       ________  ____________________________________________
 _    18         _       ________  ____________________________________________
 _    19         _       ________  ____________________________________________
 _    20         _       ________  ____________________________________________
 _    21         _       ________  ____________________________________________
 _    22         _       ________  ____________________________________________
 _    23         _       ________  ____________________________________________
 _    24         _       ________  ____________________________________________
 _    25         _       ________  ____________________________________________
 _    26         _       ________  ____________________________________________
```

Figure 169. Scheduling Environment Change Groups Entry Panel

This panel is a scrollable list of the 999 groups available.

The fields and their meanings are listed below:

- (S)elect for update

  To add or change the selection criteria for a resource, you must enter an **S**in the **Sel** column. Another window will open where you can specify the resource type (such as DDNAME, UNITNAME, RACFGROUP) and the resource names or masks. (See Figure 166 on page 5-187for an example of this panel.)

- (D)elete group

  To clear a resource group, enter a **D** in the **Sel** column. When you use this command and there are selection criteria attached to the resource, another panel will be displayed showing the selection criteria and warning you that they will be deleted if you continue. Press PF3 (end command) to process the deletion, or enter **CANCEL** on the command line to cancel the delete process. (See Figure 167 on page 5-189 for an example of this panel.)

- (C)opy

  Use the copy line command along with the **(O)ver** line command to copy an existing resource group over an empty group. All the existing selection criteria is copied along with the resource group.

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- (M)ove

  Use the move line command along with the **(O)ver** line command to move an existing resource group over an empty group. All of the existing selection criteria is moved along with the resource group.

- Change Description Field

  To change or add a description, simply type into the field.

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Change SRVCLASS Groups

This function allows you to specify up to 999 different sets of rules to allow changing the Workload Manager SRVCLASS parameter. The 999 rule sets are shared between normal resource routing, changing the jobclass/priority, changing scheduling environments, changing the service class or changing the execution node.

The rules are processed sequentially and attached to the job in the order processed. Because of this the last matching rule will be the one that actually sets the service class.

Note: You must enable **Automatic Routing**. See "System Level Controls" on page 5-180.

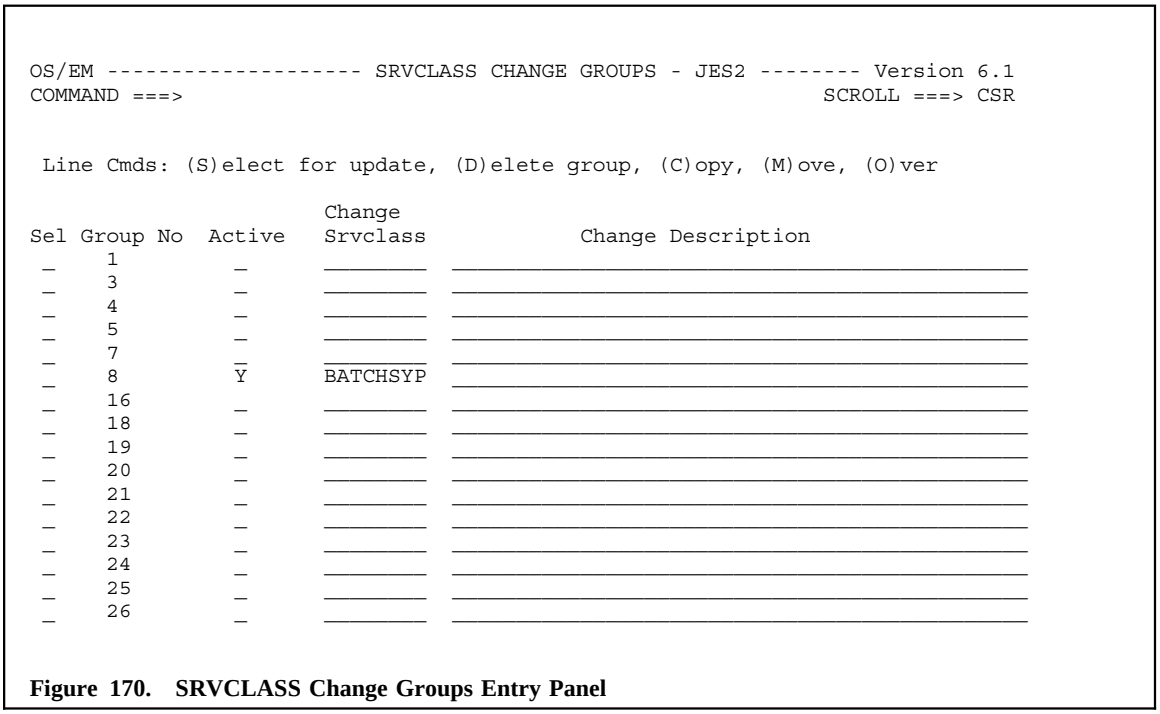

Figure 170. SRVCLASS Change Groups Entry Panel

This panel is a scrollable list of the 999 groups available.

The fields and their meanings are listed below:

- (S)elect for update

  To add or change the selection criteria for a resource, you must enter an **S**in the **Sel** column. Another window will open where you can specify the resource type (such as DDNAME, UNITNAME, RACFGROUP) and the resource names or masks. (See Figure 166 on page 5-187for an example of this panel.)

- (D)elete group

  To clear a resource group, enter a **D** in the **Sel** column. When you use this command and there are selection criteria attached to the resource, another panel will be displayed showing the selection criteria and warning you that they will be deleted if you continue. Press PF3 (end command) to process the deletion, or enter **CANCEL** on the command line to cancel the delete process. (See Figure 167 on page 5-189 for an example of this panel.)

- (C)opy

  Use the copy line command along with the **(O)ver** line command to copy an existing resource group over an empty group. All of the existing selection criteria is copied along with the resource group.

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- (M)ove

  Use the move line command along with the **(O)ver** line command to move an existing resource group over an empty group. All of the existing selection criteria is moved along with the resource group.

- Change Description Field

  To change or add a description, simply type into the field.

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Change XEQ Node Groups

This function allows you to specify up to 999 different sets of rules to allow changing the execution node parameter. The 999 rule sets are shared between normal resource routing, changing the jobclass/priority, changing scheduling environments, changing the service class or changing the execution node.

The rules are processed sequentially and attached to the job in the order processed. Because of this the last matching rule will be the one that actually sets the execution node.

Note: You must enable **Automatic Routing**. See "System Level Controls" on page 5-180.

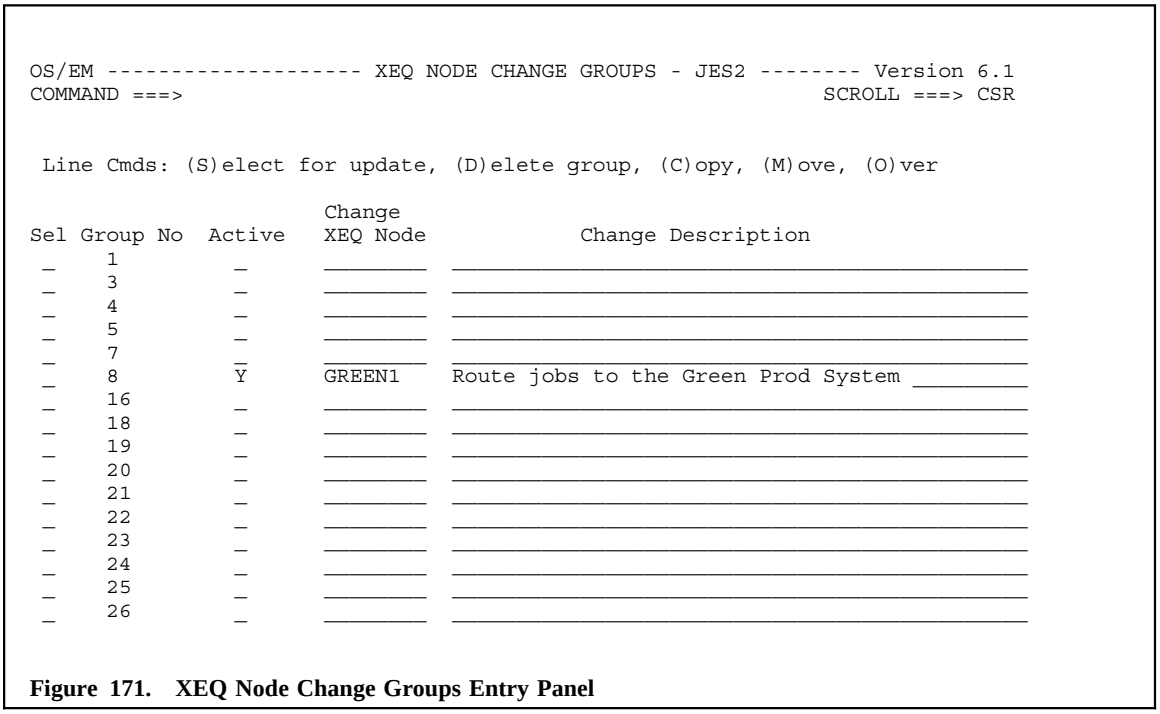

Figure 171. XEQ Node Change Groups Entry Panel

This panel is a scrollable list of the 999 groups available.

The fields and their meanings are listed below:

- (S)elect for update

  To add or change the selection criteria for a resource, you must enter an **S**in the **Sel** column. Another window will open where you can specify the resource type (such as DDNAME, UNITNAME, RACFGROUP) and the resource names or masks. (See Figure 166 on page 5-187for an example of this panel.)

- (D)elete group

  To clear a resource group, enter a **D** in the **Sel** column. When you use this command and there are selection criteria attached to the resource, another panel will be displayed showing the selection criteria and warning you that they will be deleted if you continue. Press PF3 (end command) to process the deletion, or enter **CANCEL** on the command line to cancel the delete process. (See Figure 167 on page 5-189 for an example of this panel.)

- (C)opy

  Use the copy line command along with the **(O)ver** line command to copy an existing resource group over an empty group. All of the existing selection criteria is copied along with the resource group.

- (M)ove

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Use the move line command along with the **(O)ver** line command to move an existing resource group over an empty group. All of the existing selection criteria is moved along with the resource group.

- Change Description Field

  To change or add a description, simply type into the field.

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Miscellaneous Controls

Description

The Miscellaneous Controls Menu provides access to the ACF2 Non-cancel Override, Catalog Account Control, Estimated Costs Controls, TSO Program Intercept and WTO functions.

Miscellaneous Controls Menu

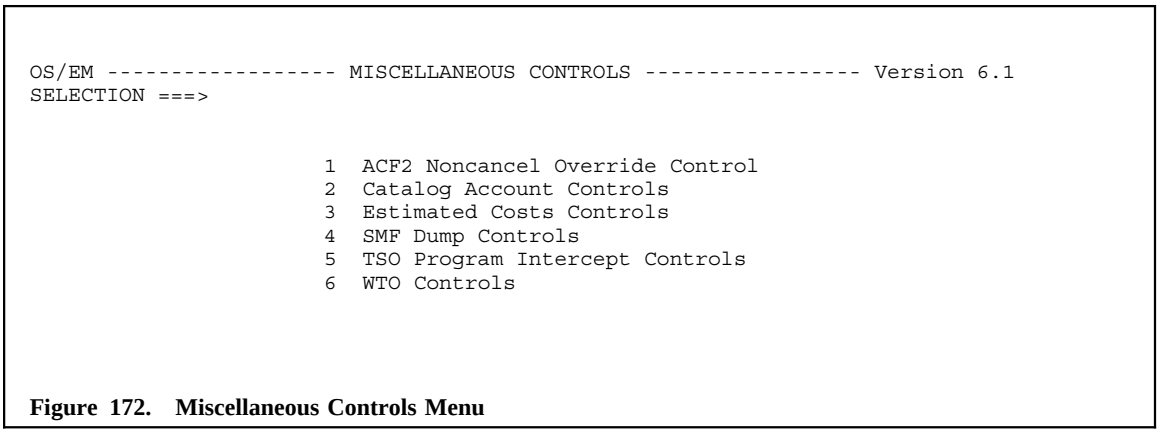

Figure 172. Miscellaneous Controls Menu

Each of these functions is presented in the following sections:

1. ACF2 Non-cancel Override (see “ACF2 Non-cancel Override Control” on page 5-199)
2. Catalog Account Control (see “Catalog Account Control” on page 5-200)
3. Estimated Costs Controls (see “Estimated Costs Controls” on page 5-204)
4. SMF Dump Controls (see “SMF Dump Controls” on page 5-208)
5. TSO Program Intercept (see “TSO Program Intercept” on page 5-211)
6. WTO (see “WTO Controls” on page 5-212)

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ACF2 Non-cancel Override Control

The ACF2 Non-cancel Override allows OS/EM to enforce controls previously setup for ACF2 users who have the non-cancel attribute.

```
OS/EM ------------- ACF2 NONCANCEL OVERRIDE CONTROL ------------- Version 6.1
COMMAND ===>

      ACF2 Noncancel Override Active ===> YES         (Yes/No)
```

Figure 173. ACF2 Non-cancel Override Entry Panel

Field entry is as follows:

- ACF2 Noncancel Override Active

  Enter **YES** to activate this function, or **NO** to deactivate it.

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Catalog Account Control

The Catalog Account Control function will place up to 32 characters of JOB or STEP accounting information into the catalog record for a new VSAM or SMS-managed non-VSAM data set. The Access Methods Services program, DCOLLECT, can then be used to produce charge-back reports for DASD utilization.

If a catalog account field is already present, e.g., it was specified on the IDCAMS DEFINE statement, it is not replaced. If both JOB and STEP accounting information is present, STEP accounting takes precedence.

You must enable SMF record type 61 in your SMFPRMxx parmlib member for this function to operate.

The **Catalog Account** entry panel provides the means for tailoring the function to an installation's specific needs. The information to be selected from either a JOB's accounting fields or a STEP's accounting fields and placed in the 32-byte catalog account field can be controlled by up to eight subfield entries.

These subfield entries specify an account field, a starting position within the account field and the number of characters to select. This allows for selecting all or parts of up to eight different accounting fields or eight parts of a single accounting field or any combination in between. The subfields are processed from left-to-right and the information obtained from processing each is placed in the catalog account field in left-to-right order as well.

If a subfield requests an account number that is not present, or there is not enough data in the account field to satisfy the requested subfield length, provision is made to use an error character to fill in the gap. If the subfield length is zero, the subfield is skipped. If the combined subfield lengths are greater than 32 characters, only the first 32 are used.

There is a **DEFAULT** group of subfield entries and provision for up to 16 additional groups of subfield entries that are used in conjunction with selection criteria such as **JOBNAME, JOBCLASS, USERID** and **RACF GROUPNAME**. Weights can be assigned to the selection criteria so that if a match is made on more than one criterion, the one with the highest weight assigned is the subfield selection group used. If weights are not assigned or are equal, the first group (from 1 to 16) that satisfies the criteria is used. If no criteria are met, the default selection group is used.

The primary entry panel for the Catalog Account Controls function allows you to turn the function on or off; specify an error fill code to be used for a missing or short account field; specify the name of the started task(s) which handle recalling or recovering datasets which have been migrated or backup up; specify the default selection values to build the accounting code if a job does not match any of the 16 selection groups; specify an Owner ID to be used if missing from the ACEE; specify weights to be applied to the different selection criteria which may be specified.

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```
OS/EM ----------------- CATALOG ACCOUNT CONTROLS ---------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR
                                                                          R
 Catalog Account Active:  YES                                             A
             Error Code:  /     Archival STC Names: HSM      ________     C
                                                                       C  F
                     1     2     3     4     5     6     7     8       U  L
 Select      Field  3     0     __    5     3     1     1     __   J  S  A  G
 Defaults:   Start  1     1     ___   3     8     1     1     ___  O  E  S  R
             Length 1     1     __    1     1     1     1     __   B  R  S  P
             Owner  IGGYPOP
(S)elect lists, (D)elete lists                    Weights: (1234) 1  2  3  4
S GRP Active                                                  Active Lists
_  1    Y    Field  5     7     3     1     3     5     1     __          I
             Start  4     1     9     1     3     5     5     ___
             Length 1     1     1     1     1     1     1     __
_  2    Y    Field  11    5     0     5     1     11    9     __   I
             Start  3     2     2     0     5     2     4     ___
             Length 1     1     1     1     1     1     1     __
_  3    Y    Field  9     3     7     3     5     7     11    1       I
             Start  1     3     1     7     4     2     2     4
             Length 1     1     1     1     1     1     1     1
_  4    Y    Field  3     11    3     7     0     9     3     __             I
             Start  0     4     3     4     5     1     1     ___
```

Figure 174. Catalog Account Control Entry Panel

Field entry is as follows:

- Catalog Account Active

  Enter **YES** to activate this function, or **NO** to deactivate it.

- Error Code

  Specify a one byte character to be used to fill any missing or short account field.

- Archival STC Names

  Specify the name of the started task which handles recalling or recovering datasets which have been migrated or backed up. Two names may be entered. If you are running IBM's DFSMSHSM, this name might be HSM. This is a **required** field so that OS/EM does not try to add accounting information to datasets being recalled from migration or recovered from a backup.

- Select Defaults

  The Defaults fields builds the account number from the accounting codes of jobs not specifically selected by one of the 16 selection groups.

  You may specify up to 8 accounting code fields to build the account number. Specify the accounting code field, the starting position within the field and the length to use. Also specify an Owner ID to be used in the event that the ACEE is unavailable.

  Note: If an accounting code field is specified as 0, the first non-zero length accounting code field will be used.

- Weights

  Enter the weight to be given to each type of selection criteria. Enter a value between 1 and 4. The weight is used when a JOB matches more than one selection group. The group with the highest weight value is used. If more than one group is determined to have the same weight, the first group selected will take effect.

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This means that if the JOB being tested matches a selection group based on the JOBNAME, but also matches a selection group based on the RACF Group Name, then which group has the highest value assigned to its weight value will be used.

The bottom portion of the panel is a scrollable area containing the 16 possible selection groups. Enter the account code field number, the starting position within the field and the length of the field to be moved. You may specify up to eight areas. They may be the same or different field numbers.

To delete a field entry no longer needed, you must blank out the field, start and length fields.

To the right of the panel are four indicators showing the type of selection list, Job Name, User ID, Job Class or RACF Group. An **I** means that it is an **INCLUDE** group, while an **E** means that it is an **EXCLUDE** group.

To make the list active, enter a **Y** in the **ACTIVE** column. Enter a **N** to turn the list off without having to blank out the entries.

To update the selection list types, place a **S** in the **S** column and press enter.

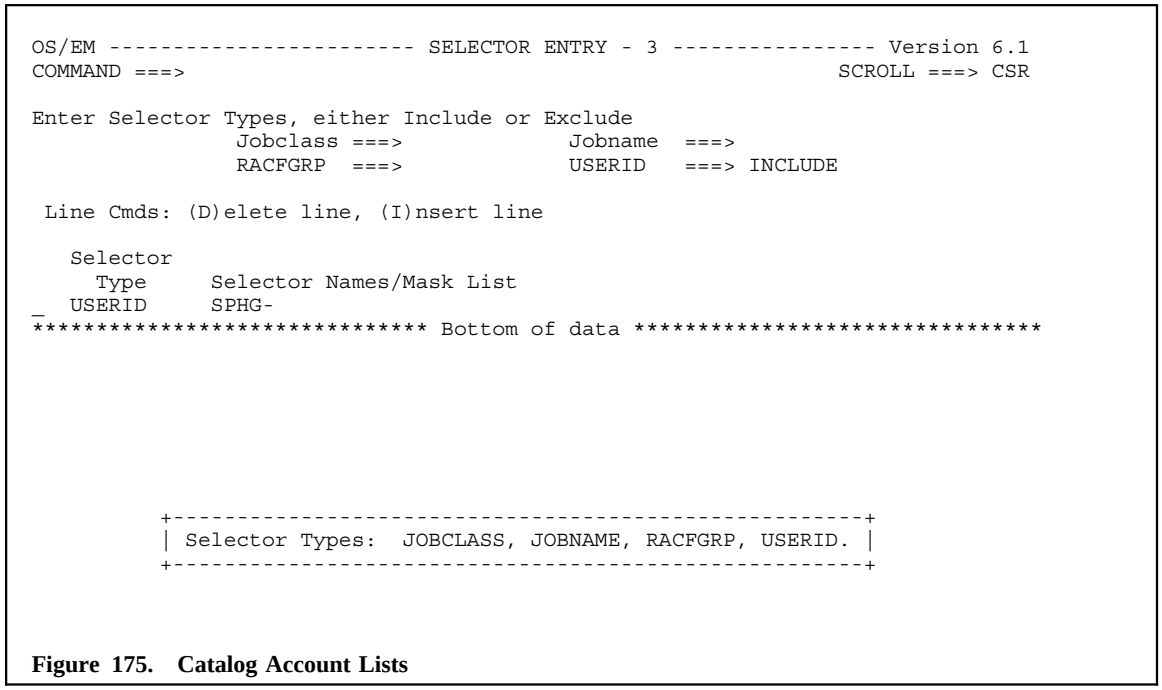

Figure 175. Catalog Account Lists

This selection panel allows you to specify the selector types active for this catalog account selection group, as well as specifying the list type, either **INCLUDE** or **EXCLUDE**.

To enter selector entries, use the **I** command to insert a blank line, then enter the **Selector Type** and the names or masks that will be checked. Separate the names with a space. If you have more names/masks than will fit on a line, simply insert another blank line and use the same selector type.

When entering jobclasses, you may enter a range of classes by separating the first and last class with a colon (:), i.e. A:D will cause OS/EM to check class A, B, C and D.

The four selector types available are:

- JOBNAME

  Enter either complete job names, or job name masks. If the list type is **INCLUDE**, only these jobs will be processed by this control definition. If the list type is **EXCLUDE**, all jobs but these will be processed by this definition.

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- JOBCLASS

  Enter either individual job classes, or a range of classes by specifying the range with a colon (:) in between the beginning and ending classes. If the list type is **INCLUDE**, only these classes will be eligible for processing by this definition. For an **EXCLUDE** list, all classes except for these will be processed.

  The **jobclass** list specifies the execution classes to which OS/EM will apply catalog account controls.

  Enter individual classes, or enter a class:class pair. Entering A:9 as the jobclass covers all possible classes.

  Jobclass lists are built, independently, for each selection group.

- RACFGRP

  Enter either complete RACF group names, or name masks. If the list type is **INCLUDE**, only these groups will be processed by this control definition. If the list type is **EXCLUDE**, all groups except these will be processed.

  The **RACF GROUP NAMES** list specifies the RACF groups to which OS/EM will apply catalog account controls.

  RACF group lists are built, independently, for each selection group.

- USERID

  Enter either complete User IDs or ID masks. If the list type is **INCLUDE**, only these IDs will be processed by this control definition. If the list type is **EXCLUDE**, all IDs except these will be processed.

  The **USERID** list specifies the User IDs to which OS/EM will apply catalog account controls.

  User ID lists are built, independently, for each selection group.

Note: The following restrictions apply:

- SMS-managed datasets only.
- SMF record type 61 must be enabled in the SMFPRMxx parmlib member.
- If a catalog account field is already present, e.g., it was specified on the IDCAMS DEFINE statement, it is not replaced.
- If both JOB and STEP accounting information is present, STEP accounting takes precedence.

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Estimated Costs Controls

The **Estimated Cost** function of OS/EM can be used to calculate an approximate charge for running each step of a job and an approximate total cost of running the job. The costs are presented in the **flower box** produced by requesting OS/EM's **STEP/JOB-end statistics** (see “Job/Step Statistics” on page 5-160.)

The Estimated Cost Controls panel provides the means for tailoring the computation of estimated cost to an Installation's specific needs. There are twelve selectable rate fields that can be specified as multipliers against usage measurements such as service units, CPU time, I/O activity and tape mounts. Additionally, field entries are provided for a CPU time normalization factor, a fixed cost that is added to each job's total cost, and a default minimum cost of a job that will be used if the calculated cost is lower. Up to sixteen separate sets of rates can be specified based upon System ID. A default set of rates can also be specified that will be used against work run on any LPAR for which there is no specific System ID set of rates.

Which rate or rates to specify is up to each individual installation. If an installation wishes to compute an estimated cost based upon TCB CPU time only, then only that rate field needs to be entered. A value of zero for a rate negates the use of that rate in the cost calculation. The computed values for each rate/usage measurement combination (rounded up to two decimal places) are added together to arrive at an estimated cost. If a fixed cost value is specified it will be added to the job's total cost. If a minimum cost value is specified it will be used for a job's total cost if the calculated value is lower.

```
OS/EM ------------------ ESTIMATED COST GROUPS ------------------ Version 6.1
Command ===>                                                  Scroll ===> CSR


 Estimated Cost Controls Active ===>  YES

 Set Default Values ===>  NO

 (S)elect for Update
Sel   Group   Active   SYSID   Description
 _      1        Y      WXYZ    NON-EXISTANT SYSTEM LPAR
 _      2        Y      TEST    TEST LPAR
 _      3        Y      EXPR    PRODUCTION SYSTEM
 _      4        N      ____    ________________________________________
 _      5        N      ____    ________________________________________
 _      6        N      ____    ________________________________________
 _      7        N      ____    ________________________________________
 _      8        N      ____    ________________________________________
 _      9        N      ____    ________________________________________
 _      10       N      ____    ________________________________________
 _      11       N      ____    ________________________________________
 _      12       N      ____    ________________________________________
 _      13       N      ____    ________________________________________
 _      14       N      ____    ________________________________________
```

Figure 176. Estimated Cost Groups Panel

Field entry is as follows:

- Estimated Cost Controls Active

  Enter **YES** to activate this function, or **NO** to turn it off.

  Even if this function is turned on nothing will happen unless there is at least one non-zero field entry in either the Default selection or one of the 16 System ID selection groups, and the STEP/JOB-end statistics function is activated.

- Set Default Values

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Entering **YES** brings up a panel that allows a set of default rates to be entered that will be used if there is no specific set of rates for the System ID the job is running on. (See “Estimated Costs Controls”.)

The bottom portion of this panel contains a scrollable list of the sixteen (16) available rate groups. Each entry must specify the SMFID of the system to which the rates apply and for the rates to be active you must enter a **Y** in the **Active** column. An optional line of descriptive text may also be entered.

Below is a sample of the rates data entry panel along with a description of each field.

```
OS/EM ------------ ESTIMATED COST CONTROLS - 0 ------------ Version 6.1
COMMAND ===>

 System ID:     DEFT

 Minimum Cost:  00010 . 00            Fixed Cost:    00002 . 00

 Service Unit Multipliers:
   TCB Service Units: . 3500000       I/O Service Units: . 7400000
   SRB Service Units: . 3300000       MSO Service Units: . 2900000

 CPU Time Multipliers:
   TCB CPU Time:  01 . 32000          SRB CPU Time:  02 . 43000

 I/O Activity Multipliers:
   DASD:  00 . 87300                  TAPE:  02 . 25000
   VIO:   01 . 99000

 Tape Mount Multipliers:
   Specific Tape Mounts:  03 . 59000  Non-Specific Tape Mounts:  02 . 11000

 Normalization Factor:    001 . 0000  Device Connect Time:  01 . 11000
```

Figure 177. Estimated Cost Controls Panel

Field entry is as follows:

- Minimum Cost

  A value of the form xxxxx.xx. If specified, it will be used as the cost of a job when the calculated cost is lower.

- Fixed Cost

  A value of the form xxxxx.xx. If specified, it will be added to the value calculated for a job.

- Service Unit Multipliers

  - TCB Service Units

    A rate value of the form .xxxxxxx specifying the cost of a TCB service unit. The number of TCB service units in the SMF type 30 record field, SMF30CSU, is multiplied by this rate to obtain the cost.

  - I/O Service Units

    A value of the form .xxxxxxx specifying the cost of an I/O service unit. The number of I/O service units in the SMF type 30 record field, SMF30IO, is multiplied by this rate to obtain the cost.

  - SRB Service Units

A rate value of the form .xxxxxxx specifying the cost of a SRB service unit. The number of SRB service units in the SMF type 30 record field, SMF30SRB, is multiplied by this rate to obtain the cost.

- MSO Service Units

  A value of the form .xxxxxxx specifying the cost of an MSO service unit. The number of MSO service units in the SMF type 30 record field, SMF30MSO, is multiplied by this rate to obtain the cost.

- CPU Time Multipliers
  - TCB CPU Time

    A value of the form xx.xxxxx specifying the cost of a TCB CPU second. The number of TCB CPUY seconds in the SMF type 30 record field, SMF30CPT, is multiplied by this rate to obtain the cost. If a normalization factor is specified, the cost calculated will be multiplied by the factor.

  - SRB CPU Time

    A value of the form xx.xxxxx specifying the cost of a SRB CPU second. The number of SRB CPU seconds in the SMF type 30 record field, SMF30CPS, is multiplied by this rate to obtain the cost. If a normalization factor is specified, the cost calculated will be multiplied by the factor.

- I/O Activity Multipliers
  - DASD

    A value of the form xx.xxxxx specifying the cost of a disk I/O. The number of disk I/Os contained in the SMF type 30 record field, SMF30BLK (when the SMF30DEV field indicates DASD), is multiplied by this rate to obtain the cost.

  - TAPE

    A value of the form xx.xxxxx specifying the cost of a tape I/O. The number of tape I/Os contained in the SMF type 30 record field, SMF30BLK (when the SMF30DEV field indicates tape), is multiplied by this rate to obtain the cost.

  - VIO

    A value of the form xx.xxxxx specifying the cost of a virtual I/O. The number of virtual I/Os contained in the SMF30 record type field, SMF30BLK (when the SMF30DEV field indicates VIO), is multiplied by this rate to obtain the cost.

- Tape Mount Multipliers
  - Specific Tape Mounts

    A value of the form xx.xxxxx specifying the cost of a specific tape mount. The number of specific tape mounts contained in the SMF type 30 record field, SMF30TPR, is multiplied by this rate to obtain the cost.

  - Non-specific Tape Mounts

    A value of the form xx.xxxxx specifying the cost of a non-specific tape mount. The number of non-specific tape mounts contained in the SMF type 30 record field, SMF30PTM, is multiplied by this rate to obtain the cost.

- CPU Time Normalization Factor

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A multiplier factor of the form xxx.xxxx that may be used to normalize processor speeds. When specified it is applied only to costs based on TCB and SRB CPU time usage to account for differences in processor speeds.

- Device Connect Time

  A value of the form xx.xxxxx specifying the cost of a Device Connect Time second. The number of Device Connect Time seconds in the SMF type 30 record field, SMF30TCN, is multiplied by this rate to obtain the cost.

Restrictions/Requirements:

1. This function requires the use of SMF exit IEFACTRT and SMF record types 30.4 and 30.5. The SYS1.PARMLIB member, SMFPRMxx, should reflect this requirement.

2. The calculated estimated cost of a STEP/JOB is displayed in the STEP/JOB-end statistics produced by OS/EM. This function must be enabled.

3. Rounding to two (2) decimal places takes place at the end of **each** calculation, not at the end of cost processing.

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SMF Dump Controls

This function allows you to specify the name of a JCL procedure that is to be executed when an SMF log is closed. The procedure would typically archive the SMF data and clear the log for subsequent reuse.

This function will obsolete any in-house maintained IEFU29 and/or IEFU29L user exits that are currently being used. Users should deactivate any IEFU29 & IEFU29L user exits prior to enabling this function.

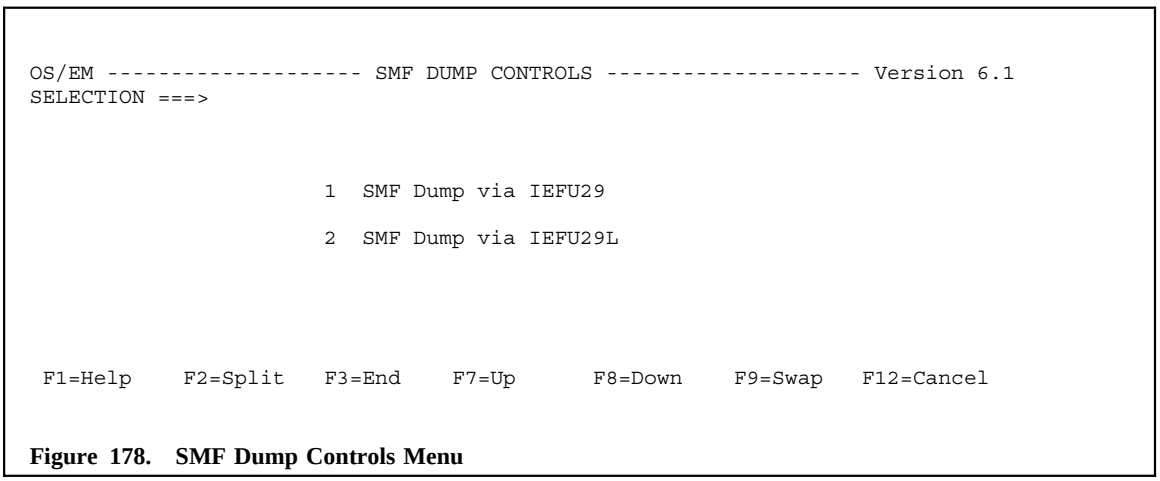

Figure 178. SMF Dump Controls Menu

Select the desired option:

1. **SMF Dump via IEFU29 -** This function processes the SMF data that is being recorded to standard SMF log datasets.

2. **SMF Dump via IEFU29L -** This function processes the SMF data that is being recorded to the System Logger. This function is only supported for z/OS Version 1.9 or later.

Note: The IEFU29 and/or IEFU29L user exits must be enabled in the SMFPRMxx member in the system PARMLIB (refer to the MVS Initialization and Tuning Reference).

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```
OS/EM ---------------- SMF DUMP CONTROLS - IEFU29 --------------- Version 6.1
COMMAND ===>

    Issue Start Command?  ===> YES        (Yes/No)

      PROC Name           ===> SMFDUMP    (Required)

      DSN Symbol Name     ===> SMFDSN     (Optional)
```

Figure 179. SMF Dump Controls (IEFU29) Entry Panel

Field entry is as follows:

- Issue Start Command?

  Enter **YES** to execute the named procedure when the SMF log is switched, or **NO** to disable this function.

- PROC Name

  Enter the name of the PROC that OS/EM will start. Ensure that this procedure is in a system procedure library. This is a required parameter.

- DSN Symbol Name

  If your procedure to dump the SMF datasets requires a dataset name to be passed, enter the symbol name so that OS/EM can add it to the start command. **Do NOT** add a leading ampersand to the symbol name.

Note: When this option is activated, the processing module will always complete with a return code of 4. This will suppress the SMF dump messages (IEE362I and IEE362A) from being displayed. Users should ensure that this suppression of messages does not impact any automated operations that rely on these messages to trigger other actions.

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```
OS/EM --------------- SMF DUMP CONTROLS - IEFU29L --------------- Version 6.1
COMMAND ===>

    Issue Start Command?  ===> YES        (Yes/No)

      PROC Name           ===> SMFDUMP    (Required)
```

Figure 180. SMF Dump Controls (IEFU29L) Entry Panel

Field entry is as follows:

- Issue Start Command?

  Enter **YES** to execute the named procedure when the SMF log is switched, or **NO** to disable this function.

- PROC Name

  Enter the name of the PROC that OS/EM will start. Ensure that this procedure is in a system procedure library. This is a required parameter.

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TSO Program Intercept

This function allows you to specify the name of a program that is executed under TSO and disallow use of the program and writing up to 5 lines of explanation.

This would typically be used to force execution of certain programs only on the LPAR where they are licensed.

Space for thirty-two programs is provided.

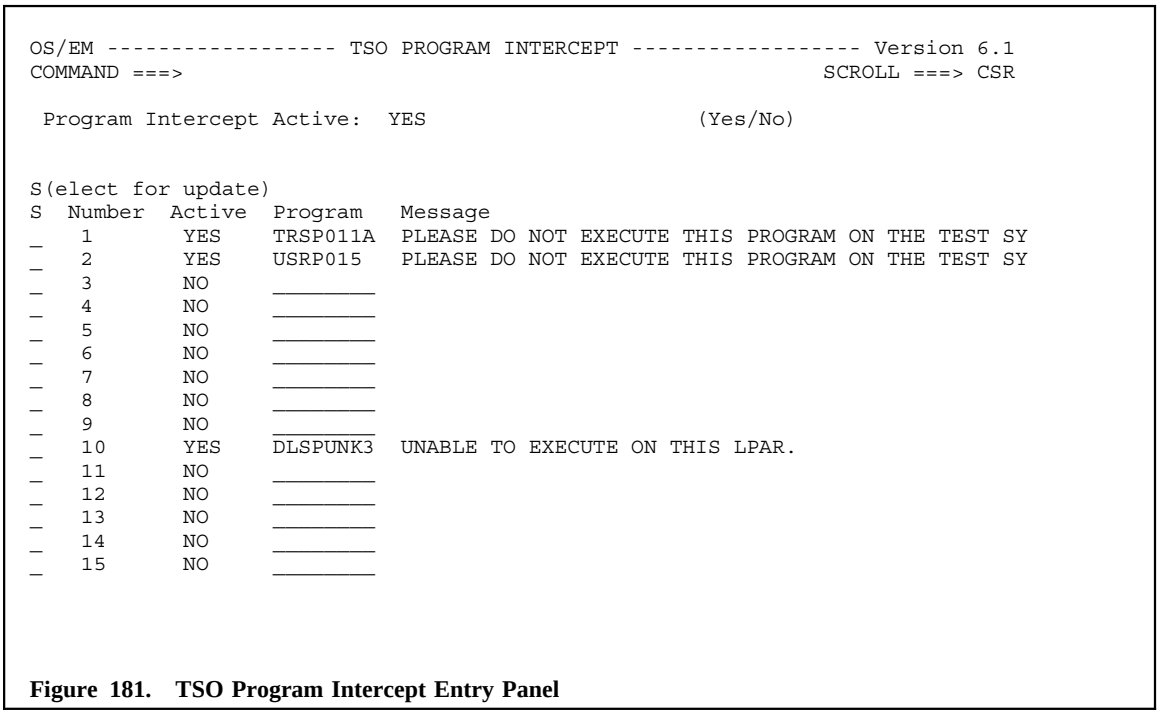

Figure 181. TSO Program Intercept Entry Panel

Field entry is as follows:

- Program Intercept Active

  Enter **YES** to activate this function, or **NO** to deactivate it.

There are 32 available slots to specify a program name and the associated messages.

To activate any of the 32 slots, tab to the appropriate slot and enter **YES** To deactivate a slot, enter **NO**.

For each slot activated, and program name and message must be entered. To enter or change a program name, simply tab to the program field and type the program name. To add or change the message, enter an **S** in the select column on and press enter. A popup window will open allowing 5 lines of text.

Note: Do not use apostrophes (') in your message text!

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WTO Controls

Description: The WTO Controls function allows OS/EM to monitor user specified DD names for specific messages. When found, the message is written to the system console to allow appropriate action by either the operator or an automated operations package.

The DD name to be monitored may be limited to specific job names and/or program names. To have this function active, you must specify at a minimum a message id to search for, a DD name to search, and the program name (from the exec card) which owns the DD name.

WTO Controls Entry Panel

```
OS/EM ---------------------- WTO CONTROLS ---------------------- Version 6.1
Command ===>                                                  Scroll ===> CSR

              WTO Controls Active ===> YES         (Yes/No)

Line Commands: (S)elector Groups, (D)elete Groups

                                                    Active Selection Lists
                    Add      Route    Description    DD    Job  Message  Program
SEL Num Active   OSEM ID    Codes       Codes      Name   Name   ID       Name
 '  1     YES      YES       YES         YES       YES    YES    YES      YES
 '  2     NO       ___
 '  3     NO       ___
 '  4     NO       ___
 '  5     NO       ___
 '  6     NO       ___
 '  7     NO       ___
 '  8     NO       ___
 '  9     NO       ___
 '  10    NO       ___
 '  11    NO       ___
 '  12    NO       ___
```

Figure 182. WTO Controls Entry Panel

The fields and their meanings for this entry panel are:

- WTO Controls Active

  Enter **YES** to allow use of the WTO function. Entering no here turns the function off without disturbing any of the selection lists already completed.

There are 32 available groupings which control which messages are tracked. Besides specifying the selection criteria, for each group you may have an OS/EM message number appended to the front of your message (FEMDC1195), and specify any routing codes or description codes to be used on the generated WTO.

- Active

  To activate any of the 32 groups, tab to the Active column and enter **YES**. Enter **NO** to deactivate the group.

- Add OSEM ID

  Enter **YES** in this field to have OS/EM's message number FEMDC1195 appended to the front of your message. Enter **NO** to have your message written without any modifications.

There are 2 line commands available on this panel. These are used to enter information about **route codes** and **description codes**, or to specify information in a **selection criteria list**.

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```
OS/EM ------------------------ SELECTOR ENTRY - 1 --------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR


 Line Cmds: (D)elete line, (I)nsert line

   Selector                                                          Message
     Type    Selector Names/Mask List                                 Start
_  DDNAME                                                           ________
       MSGOUT_____________________________________________________________
_  DESCCDE                                                          ________
       9__________________________________________________________________
_  JOBNAME                                                          ________
       TRPD030____________________________________________________________
_  ROUTECDE                                                         ________
       11_________________________________________________________________
_  MSGID                                                            8
       UPDATE OF MASTER FAILED____________________________________________
_  PGMNAME                                                          ________
       TRP0321P___________________________________________________________
****************************** Bottom of data ********************************

  +-------------------------------------------------------------------------+
  | Selection Types: DESCCDE, DDNAME, JOBNAME, MSGID, PGMNAME or ROUTECDE. NOTE: |
  | DDNAME, MSGID and PGMNAME are REQUIRED!
  +-------------------------------------------------------------------------+
```

Figure 183. Selector Entry Panel

There are 6 selector types available, however two types (DESCCDE and ROUTECDE) are used to store information to be passed back to MVS on the WTO macro and not used to select messages to be processed.

Three selector types are required to activate this function: DDNAME, PGMNAME and MSGID.

- DESCCDE

  Enter any description codes that should be added to the WTO macro. Multiple description codes may be entered separated by spaces.

  For a list of acceptable values, see the IBM manual **MVS Routing and Descriptor Codes**.

- DDNAME

  Enter the DDNAME(s) that OS/EM will monitor. At least one DDNAME is required to have this function active.

- JOBNAME

  Enter the JOBNAME to be monitored. Multiple jobnames separated by spaces may be entered.

- MSGID

  Enter the MSGID that OS/EM will search for. At least one MSGID must be entered for this function to be active.

  This MSGID may actually be any constant text string that always appears in the message. A column number may be entered to specify where OS/EM will begin to scan for the text string. If the Message Start field is not entered, OS/EM begins searching at column 1. Column 1 is defined as the first position after an ASA or machine control character or 3800 font selection character. A range may also be specified as xx:yy which indicates that the message must start in columns xx through and including column yy.

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Note: Only one message may be specified on a line. If multiple messages are to be monitored simply enter multiple lines all using the selector type of MSGID.

- PGMNAME.

  Enter the PGMNAME(s) that OS/EM will monitor. At least one program name is required to have this function active. Multiple programs may be entered separated by spaces.

- ROUTECDE

  Enter any route codes to be passed to the WTO macro. Multiple route codes may be specified separated by spaces.

  For a list of acceptable values, see the IBM manual **MVS Routing and Descriptor Codes**.

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QuickPool

Description

Quick Pool is a dynamic DASD pooling package for non-VSAM datasets and also enforces VSAM dataset placement as defined by the pooling rules.

Summary of Features

- Dataset Name Standards enforcement
- Warn Mode with messages written in the JES Log
- Dynamic masking for defining dataset name groups
- Dynamic masking for defining volume name groups
- DFSMS migration aid
- Optionally disallows RACF discrete profiles during dataset allocation

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QuickPool Menu

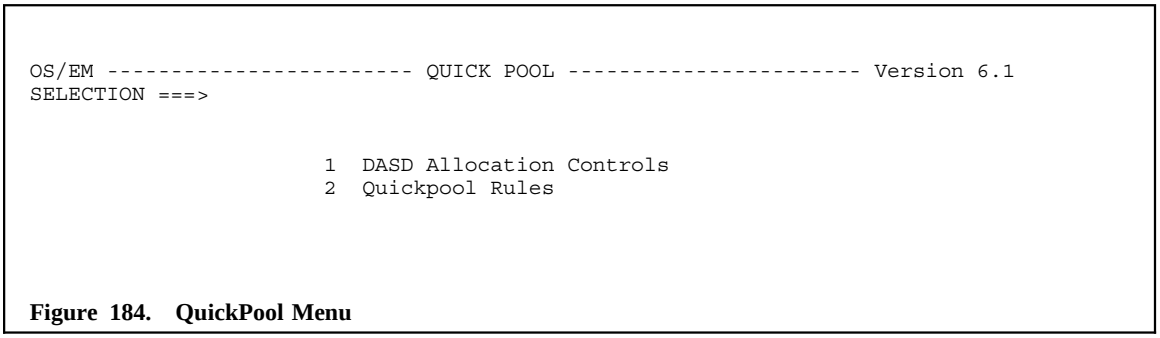

Figure 184. QuickPool Menu

Each of these paths is presented in the following sections:

1. DASD Allocation Controls (see “DASD Allocation Control” on page 5-217)
2. QuickPool Rules (see “QuickPool Rules” on page 5-220)

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DASD Allocation Control

The Control DASD allocation function consists of one panel (Figure 185). By specifying either a YES or NO, you control the following options:

- Whether absolute track allocation will be allowed
- Whether allocation requests for contiguous space will be honored
- Whether ALX allocation requests will be allowed
- Whether MXIG allocation requests will be allowed
- Whether single-level dataset names will be allowed (we recommend that you not allow such dataset names)
- Whether ISAM datasets will be allowed (if you have such datasets, you should convert them to VSAM and use the interface routines to access these datasets; IBM does not, generally, support this file organization)
- Whether unmovable datasets can be created
- Whether RACF automatic dataset protection is in effect; if this control is already set, you may set this option to RES, which will reset, or turn off, this option for a dataset (we recommend that this option be either NO, or RES; RACF generic profiles are the better approach to dataset protection)
- Whether RACF discrete profiles are allowed (again, we recommend that RACF generic profiles be used; therefore, set this option to NO or RES which will turn off existing discrete profiles)

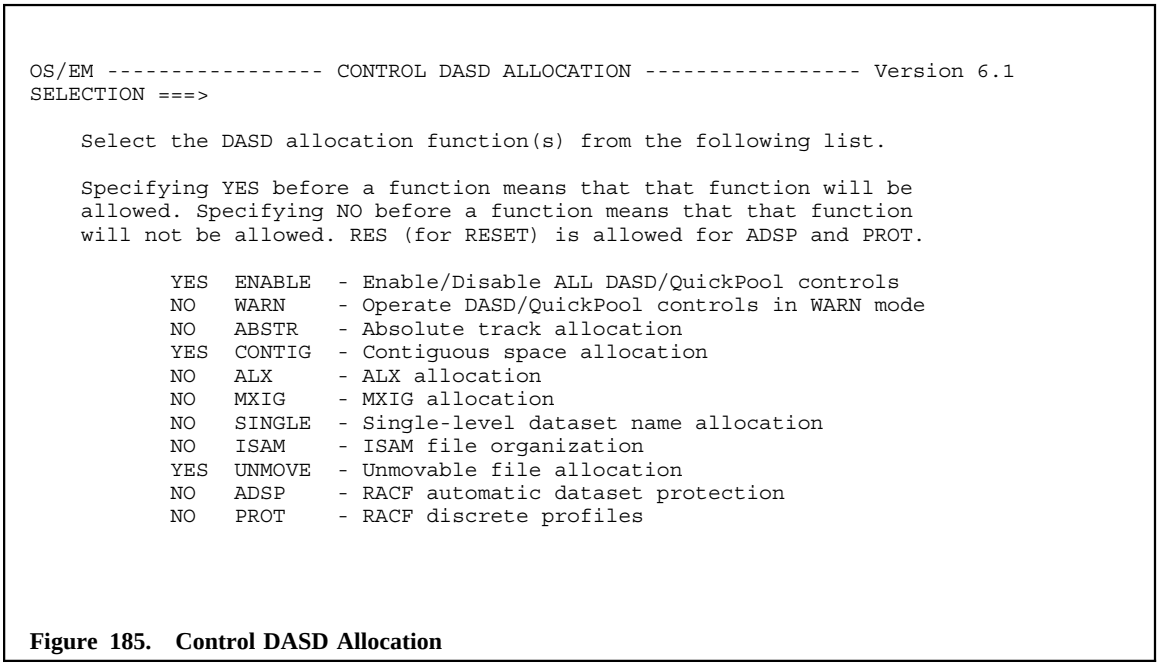

Figure 185. Control DASD Allocation

The DASD Allocation Control function may be used to allow or disallow various allocation parameters.

Field entry is as follows:

- WARN

  Warn mode establishes the action of the QuickPool function. It is more fully explained in “WARN mode” on page 5-219.

Specifies whether DASD and QuickPool controls are enforced.

When operating in WARN mode, WTO messages are generated stating the action which would have occurred if the controls were active.

Enter **YES** to enable this option; **NO** to disable this option.

- ABSTR

  Specifies whether ABSTR (ABSOLUTE TRACK) allocation will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

  It is extremely unlikely that you would ever want to allow this function for DASD allocation. Old third-party software might be the only reason for this function.

- CONTIG

  Specifies whether CONTIG (contiguous space) allocation will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

  Allowing contiguous space allocation can result in failed allocations if the volume is badly fragmented.

- ALX

  Specifies whether ALX allocation will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

  This option is presented as last entered by you.

- MXIG

  Specifies whether MXIG allocation will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

- SINGLE

  Specifies whether single-level dataset names will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

  As a general rule, you should not allow single-level dataset names. Such datasets will be cataloged in the master catalog. The master catalog should contain only SYSRES volume datasets (usually SYS1 datasets) and ALIAS pointers to user catalogs.

- ISAM

  Specifies whether ISAM dataset names will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

  As a general rule, you should not allow ISAM datasets. Most products, such as CICS, no longer directly support this access method. Use the IIP (ISAM Interface Program) and convert such files to VSAM - time is running out.

- UNMOVE

  Specifies whether unmovable datasets will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option.

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Unmovable datasets are rare - most database software uses some sort of offset relative to the beginning of the dataset to find specific records. However, such files do exist. Be careful before enabling this option.

- ADSP

  Specifies whether requests for datasets with the ADSP (Automatic Dataset Protection) attribute will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option; **RES** to turn off the ADSP for datasets allocated with this attribute.

  Proper dataset protection via your security system should make use of this attribute superfluous. That is, datasets should be defined as generic, even if only a single dataset exists under the dataset name.

- PROT

  Specifies whether discrete RACF profiles will be allowed or disallowed.

  Enter **YES** to enable this option; **NO** to disable this option; **RES** to delete the discrete attribute.

  Proper dataset protection via your security system should make use of this attribute superfluous. That is, datasets should be defined as generic, even if only a single dataset exists under the dataset name.

WARN mode: WARN mode provides you with a way of observing your allocation rules without enforcing those rules. Each time a dataset allocation would violate a rule, the allocation proceeds and a WTO message is created. The WTO message will list the dataset that was allocated, and the dataset name group the dataset resolved to. With this information, you can determine why the allocation would have been disallowed if WARN mode had not been in effect.

WARN mode should be used before actually "turning on" the QuickPool function. Allocation rules can become complicated, and your installation probably would not want production jobs failing because a dataset could not be allocated. It is also quite likely that there are jobs that do not follow whatever allocation rules your installation currently has in place. And, since the QuickPool function really should be done without reference to specific volume serial number on DD statements, time will be required to alter all your installation's JCL.

- WARN mode would also be useful if your installation is contemplating a move to IBM's DFSMS. It is possible to create QuickPool allocation rules that closely mimic those of DFSMS which could help in developing the DFSMS required classes.

- While OS/EM currently does not support the automatic allocation of VSAM datasets, WARN mode can be used to determine if VSAM datasets are being properly placed. The actual allocation of the VSAM dataset goes through DADSM and is monitored by the OS/EM QuickPool function.

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QuickPool Rules

The QuickPool function controls which datasets may, or may not, be allocated on which DASD volumes. It will also automatically place datasets on the correct volume if your jobs do not direct datasets to specific volumes (such directed allocations must still follow the rules you establish). You can create volume groups with certain performance objectives in mind and ensure that proper datasets are placed on these volumes. For example, some of your volumes may deliver better access times because of your hardware configuration. These volumes would be likely candidates for your online files where quick access can be critical. Or, you can create volume groups that will ensure that datasets with simultaneous, heavy access are properly separated. The effectiveness of the QuickPool function is determined by the volume and dataset name groups you have built.

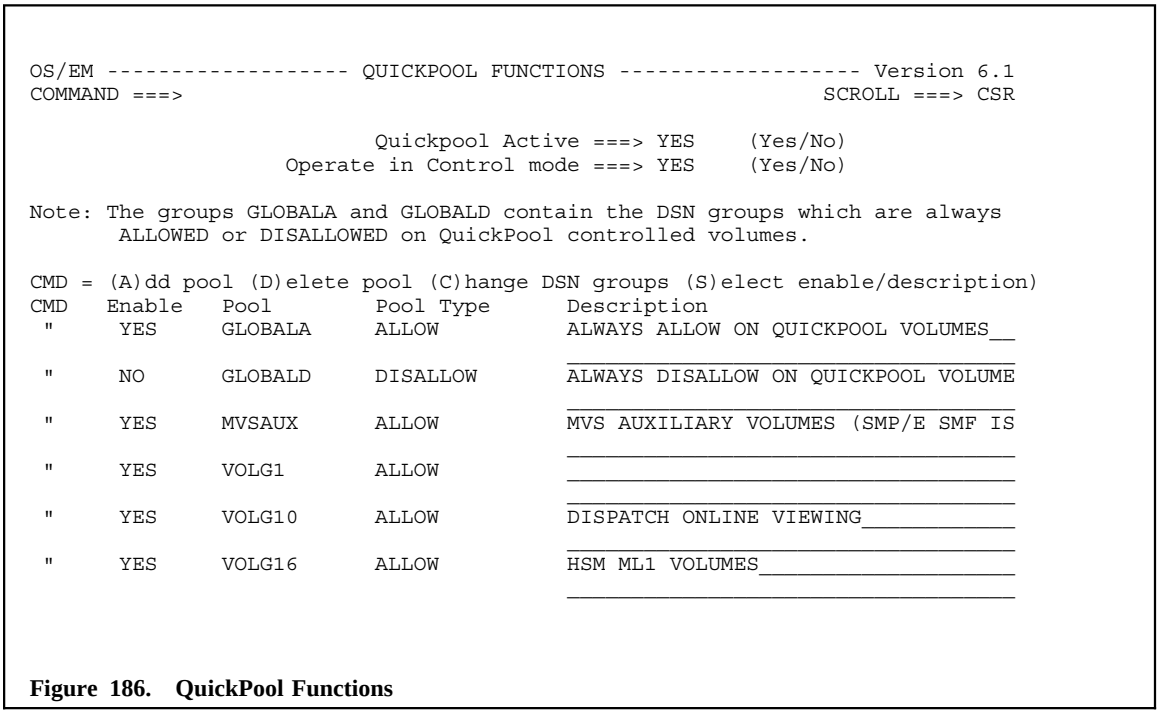

Figure 186. QuickPool Functions

The QuickPool entry panel allows you to turn on or off QuickPool, specify that QuickPool will operate in Control mode, and create/update pools.

Field entry is as follows:

1. QuickPool Active

   QuickPool is enabled by entering a **YES** (or **Y**), or disabled by entering a **NO** (or **N**).

2. Operate in Control mode

   This option establishes the QuickPool span of control. If set to YES, the QuickPool function controls all of your installation's DASD volumes, even if they have not been explicitly defined to the QuickPool function.

   Enter **NO** if the QuickPool function will control only those volumes specifically defined by the POOL list.

   If you specify CONTROL, volumes not explicitly defined by the POOL list will be controlled by the allocation rules you establish with the global ALLOW and DISALLOW lists. If you do not create such lists, volumes not resolvable to Pool lists will not have any datasets, other than SYS1 datasets, allocated to them.

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The bottom portion of the QuickPool Functions panel is a scrollable list of the pools defined. There are two special pool names which control **global** allocations. The first is **GLOBALA** where you may specify datasets which are always allowed on QuickPool volumes; and second **GLOBALD** where you specify datasets which are always disallowed. These two pool names may not be deleted or renamed. If they are not to be used, simply disable them by entering **NO** in the enable column.

Field entry is as follows:

1. CMD

   There are four line commands available. They are:

   - (A)dd pool
   - (D)elete pool
   - (C)hange DSN groups
   - (S)elect enable/description

2. POOL

   The Pool list establishes an association between volumes and datasets. Each volume group may have 'either' an ALLOW list 'or' a DISALLOW list (these are subordinates to the global lists). If you do not define these lists, the volume group is strictly under the control of the global lists.

   The ALLOW lists specifies which datasets are allowed on volumes within the group. The DISALLOW list specifies which datasets are not allowed on volumes within the group.

   The type of list you are creating for the volume group, ALLOW or DISALLOW, is specified during the ADD a new group process. Once you have chosen the type of dataset name group list to be associated with the volume group, it cannot be changed. The type of list associated with the volume group is displayed as part of the volume group POOL list display.

   The Volume group must have been previously defined (see “Define Volume Groups” on page 5-12)

3. POOL Type

   a. ALLOW

      ALLOW defines a global list of dataset name groups which apply to all your DASD volumes. Groups defined via this option are always allowed on a volume regardless of the volume's own specific ALLOW or DISALLOW lists. The current status of this option is always indicated.

      As with any OS/EM list, if you specify NO, you are deleting the list; thus, NO has no meaning in an initialization member. It only has an effect when used via the OS/EM online function.

   b. DISALLOW

      DISALLOW defines a global list of dataset name groups. Such groups are not allowed on a volume (SYS1 datasets cannot be excluded from initial allocation via this option).

   c. Global ALLOW

      The global ALLOW list (which has a pool name of GLOBALA) specifies datasets which are always allowed on volumes controlled by the QuickPool function. This list takes precedence over the global DISALLOW list and any private DISALLOW lists specified for a volume group.

      SYS1 datasets are always initially allowed on any volume.

      To update the DSN groups in the Global ALLOW pool, enter **C** in the CMD field. A list of DSN groups will be displayed (see Figure 187 on page 5-222).

   d. Global DISALLOW

The global DISALLOW list (which has a pool name of GLOBALD) specifies datasets which are always disallowed on volumes controlled by the QuickPool function. This list takes precedence over any private ALLOW lists specified for a volume group.

To update the DSN groups in the Global DISALLOW pool, enter **C** in the CMD field. A list of DSN groups will be displayed (see Figure 187).

4. Dataset Name Group

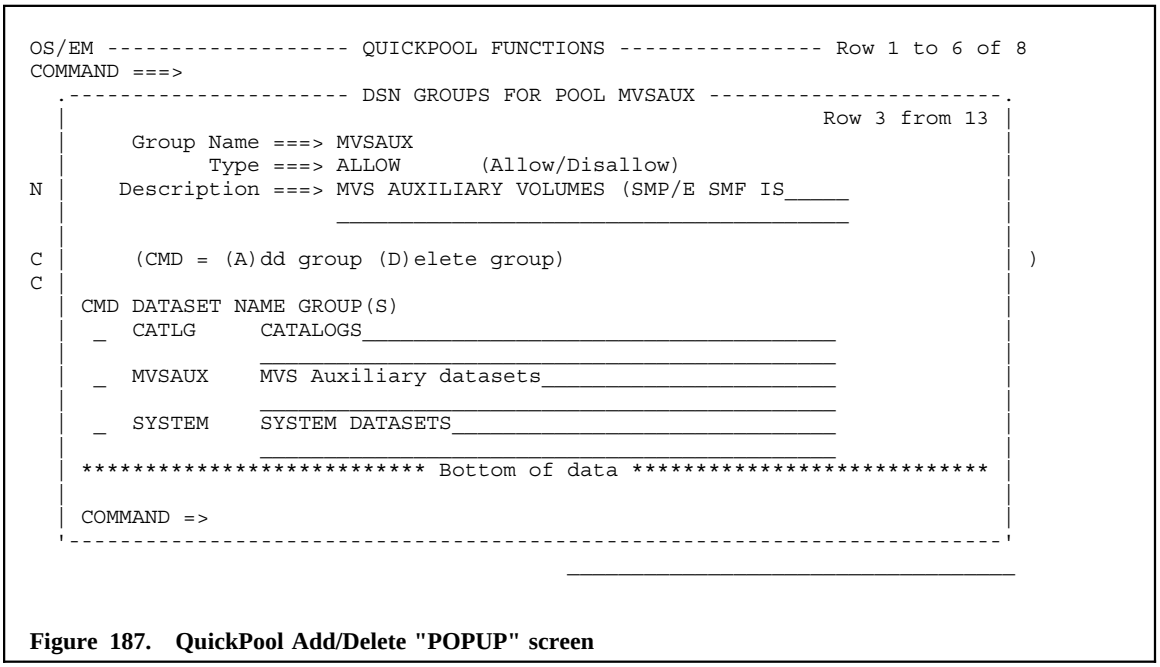

Figure 187. QuickPool Add/Delete "POPUP" screen

Field entry is as follows:

a. Add

To add entries, enter an **A** in the CMD field and **overtype** the Dataset Name Group on that line (**overtyping will not alter the old entry**).

The Dataset Name Group name must already be defined (see “Define Dataset Name Groups” on page 5-3) for the add to be successful. Duplicates will be rejected. Group names are kept in alphabetical order, and this is the search mode OS/EM uses in trying to resolve volume/dataset associations.

b. Delete

To delete entries, enter a **D** in the CMD field.

The DSN group must have been previously defined (see “Define Dataset Name Groups” on page 5-3)

If an ALLOW list is created, one of two actions will occur when a dataset is resolved to the volume group. In the case of a non-directed dataset allocation, each dataset within the listed dataset name groups will be allocated on a volume within the volume group. In the case of a directed dataset allocation, dataset allocation on a volume within the volume group will only be allowed if the dataset is resolved to one of the listed dataset name groups.

If a DISALLOW list is created, no dataset within a dataset name group will be allocated, or allowed to be allocated, on any volume within the volume group.

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If a volume group is created without an ALLOW or DISALLOW list, the group will be controlled by the global ALLOW or DISALLOW lists. If you do not create global ALLOW or DISALLOW lists, such volumes will not be eligible for allocation.

Note: SYS1 datasets are always initially allowed on any volume. However, you cannot rename a dataset to SYS1 unless you have specifically allowed SYS1 datasets on the volume.

ALLOW/DISALLOW search order: OS/EM follows an explicit hierarchy when searching the ALLOW and DISALLOW lists for a dataset name match.

Dataset name lists established with the ALLOW and DISALLOW options are global and apply to all controlled and uncontrolled volumes. Any dataset name matches resolved to either of these two lists stops the search and the resulting allocation rule will be the one used. Any matches that might apply to a specific volume group will be ignored. For example, if a dataset name resolves to the global ALLOW list, and also to a specific volume group DISALLOW list, the allocation will be permitted. The reverse is also possible: a dataset allocation will not be permitted if it is in the global DISALLOW list and also in a specific volume group ALLOW list.

If no matches are found in the global ALLOW and DISALLOW lists, or you have not specified any global ALLOW or DISALLOW lists, the volume group ALLOW and DISALLOW lists are searched. The first match within any of these lists is the allocation rule used.

Further, within the global lists, ALLOW takes precedence over DISALLOW. That is, if a dataset name can be resolved to both an ALLOW list and a DISALLOW list (because of a dataset name specification), the dataset allocation will be allowed.

- Care must be taken when dealing with VSAM datasets. OS/EM currently cannot automatically supply a volume serial number for the dataset during the IDCAMS DEFINE step; but if a VSAM dataset is not allowed on the volume, the actual allocation of the VSAM dataset will be denied.

Volume Pool considerations: You might think it "normal" to place a given volume in only one group. However, consider the follow situation:

- You have created a volume group that consists of an entire string of DASD. You would like the head-of-string volume to contain a user catalog that will point to all the datasets on that particular string. Further, since the user catalog will only use a fraction of the space on the head-of-string volume, it should be eligible for dataset allocation like any other volume in the string. Finally, you would like to ensure that certain datasets are always placed on the head-of-string volume.

The QuickPool function covers this situation by allowing the volume to be defined in two, or more, volume groups. Specific datasets can be allowed to the volume, but the volume will also be part of a volume pool which is used for the more general case.

Also consider the HSM Optimizer defragmentation process. You may wish to place a volume in one group that is defragmented on a weekly basis. You might also want to place the volume in a group that has emergency defragmentation criteria.

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RACF Controls

Description

The RACF Controls Menu provides access to the Discrete Profiles, External Tapes functions and Restricted Passwords controls.

RACF Controls Menu

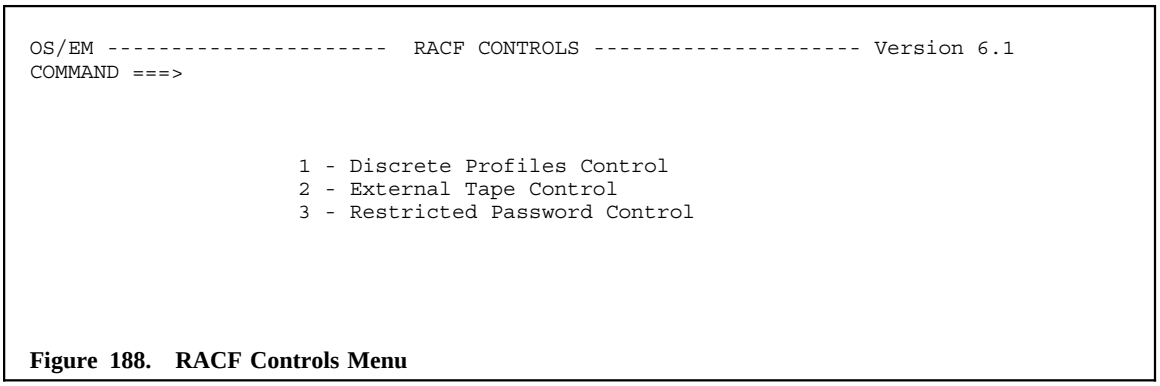

Figure 188. RACF Controls Menu

Each of these functions is presented in the following sections:

1. Discrete Profiles Control (see “RACF Discrete Profiles” on page 5-225)
2. External Tape Control (see “External Tape Control” on page 5-226)
3. Restricted Password Control (see “Restricted Password Control” on page 5-227)

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RACF Discrete Profiles

The RACF Discrete Profile provides the option to control who can create RACF discrete profiles. With DFSMShsm System Managed Storage, RACF discrete profiles are incompatible with dynamic storage groups because of the restriction the discrete profile carries(i.e. a specific volume serial number).

Note: You must define the classes to be controlled to your security manager. Use the general resource class 'FACILITY' for RACF and ACF-2 or 'IBMFAC' for CA-Topsecret and a resource name of DISCRETE.PROFILE.name where 'name' matches the class name your are protecting. For class DA-TASET the resource name or profile would be DISCRETE.PROFILE.DATASET. Read authority is required to allow creation of the discrete profile.

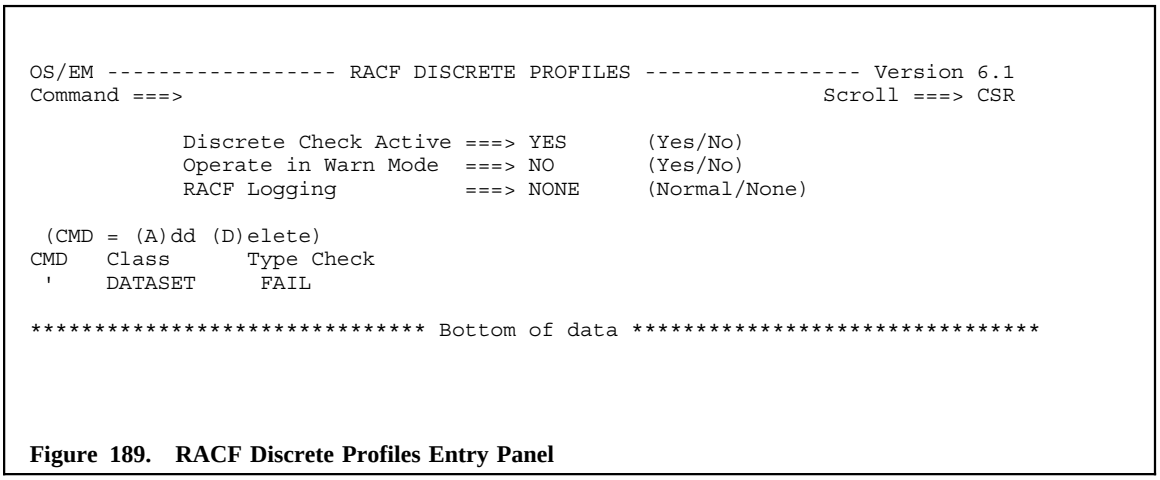

Figure 189. RACF Discrete Profiles Entry Panel

Field entry is as follows:

1. Discrete Check Active

   Enter **YES** to activate the control of discrete profile creation. Enter **NO** to deactivate this control.

2. Operate in Warn Mode

   Enter **YES** to enable warning messages to be sent to the person trying to create the discrete profile instead of failing the request.

3. RACF Logging

   Enter **NORMAL** to enable RACF standard logging, or **NONE** to disable RACF logging.

The bottom portion of the panel contains a scrollable area. There are two line commands available:

- Add

  To add entries, enter an **A** in the CMD field and **overtype** the **Class** and **Type Check** fields. (**overtyping will not alter the old entry**). The Class entry is for the RACF class to be protected. The Type Check field may contain either **WARN** or **FAIL**

- Delete

  To delete entries, enter a **D** in the CMD field.

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External Tape Control

The External Tape function allows a user to read any tape dataset when the following criteria is met, thus bypassing the RACF PROTECTALL(FAIL) option:

- A RACF profile does not exist for the dataset.
- The user has READ level authority to the FACILITY class profile EXTERNAL.TAPE.

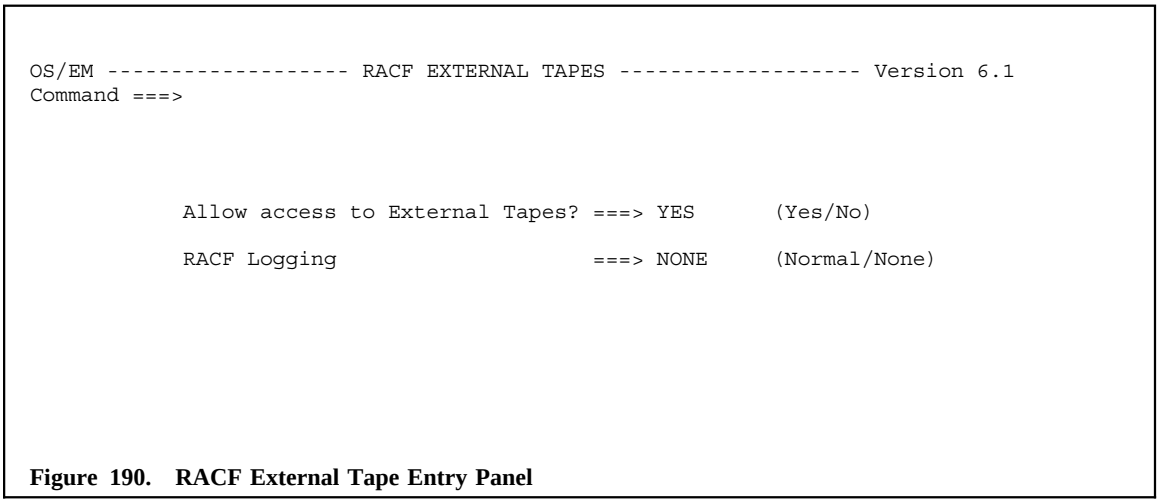

Figure 190. RACF External Tape Entry Panel

Field entry is as follows:

- Allow access to External Tapes?

  Enter **YES** to activate this function, or **NO** to deactivate it.

- RACF Logging

  Enter **NONE** to turn off RACF logging, or **NORMAL** to turn logging on.

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Restricted Password Control

The Restricted Password function allows you to control how a password is entered. The function can reject a password if it fails any of the following tests:

- The password has less than the minimum number of alpha, numeric and/or special characters.
- The password contains the RACF userid or RACF user name imbedded in the character string.
- The password is found in a list of invalid password strings and password masks.

```
OS/EM --------------- RESTRICTED PASSWORD CONTROL --------------- Version 6.1
COMMAND ===>

 Enable Restricted Password Control   ===> YES     (Yes, No)

 Reject if RACF USER ID in Password     ===> YES     (Yes, No)
 Reject if RACF User Name in Password   ===> YES     (Yes, No)

 Minimum Number of Uppercase Characters ===> 2       (0 - 8)
 Minimum Number of Lowercase Characters ===> 2       (0 - 8)
 Minimum Number of Numeric Characters   ===> 2       (0 - 8)
 Minimum Number of Special Characters   ===> 0       (0 - 8)

 Use Password Exclusion Table           ===> NO      (Yes, No)
   Update Table?                        ===> NO      (Yes, No)
```

Figure 191. RACF Restricted Password Entry Panel

Field entry is as follows:

- Enable Restricted Password Control

  Enter **YES** to control passwords or **NO** if not using this function.

- Reject if RACF USER ID in Password

  Enter **YES** to reject a new password if it contains the RACF user ID of the person owning the password.

- Reject if RACF User Name in Password

  Enter **YES** to reject a new password if it contains the RACF user name of the person owning the password. This is done by extracting variable length tokens from the RACF user name field and then testing to see if any of these tokens are imbedded in the password string.

  See **Usage Notes** below for more information.

- Minimum Number of Uppercase Characters

  Enter a number from zero to 8. This is the minimum number of uppercase alphabetic characters that must be included in the password. Entering zero (0) will turn off the uppercase character check.

- Minimum Number of Lowercase Characters

  Enter a number from zero to 8. This is the minimum number of lowercase alphabetic characters that must be included in the password. Entering zero (0) will turn off the lowercase character check.

  See **Usage Notes** for important information about this control parameter.

- Minimum Number of Numeric Characters

  Enter a number from zero to 8. This is the minimum number of numeric characters that must be included in the password. Entering zero (0) will turn off the numeric check.

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- Minimum Number of Special Characters

  Enter a number from zero to 8. This is the minimum number of special characters that must be included in the password. Entering zero (0) will turn off the special check.

  Special characters are the characters **# $ @**

- Use Password Exclusion Table

  Enter **YES** to have a list of excluded words added to the control. Enter **NO** to remove the list. See **Update Table?** below for entering the list.

- Update Table?

  Enter **YES** to create a list or modify an existing list or to simply review the list contents.

  When you have entered YES, press enter and you will be placed into full screen edit to allow you to easily enter your list items. You may enter complete words or partial words with the OS/EM mask characters (see "Appendix B. General Masking" on page B-1 for information about masks).

  After you have finished entering your list data press the end key to have the information sorted alphabetically and saved in the OS/EM table library.

  See **Usage Notes** below for more information.

Usage Notes:

- The sum of the minimum number of alpha, numeric and special characters must not exceed 8. If the sum exceeds 8, all three parameters will be reset to zero.
- The sum of the minimum number of upper & lowercase alpha, numeric and special characters must not exceed the maximum password length specified in the RACF options (SETROPTS command). If the sum exceeds the specified maximum length, the result will be that all new passwords will be rejected because it will be impossible for both password length considerations (i.e. RACF and the OS/EM Password Controls) to be simultaneously satisfied.
- The RACF user name field is 20 bytes. OS/EM password control will convert the name field into one or more tokens and then compare the token(s) with the password. Processing is as follows:
  - Convert non-alpha characters into blanks.
  - Extract any resulting blank-delimited fields that are 3-6 bytes in length to create validation tokens. If a blank-delimited field is found that is greater than 6 bytes in length, only the first 6 bytes will be used for the token and the remaining bytes are discarded.
  - Scan the submitted password and reject it if any of the tokens are imbedded in the password.

    For example, the user name 'R.W. "RUDY" REINDEER' would result in two tokens - RUDY and REINDE. If either of these tokens are found imbedded anywhere in the password, it will be rejected.
- RACF support for mixed-case passwords is an optional function introduced with z/OS 1.7. Users of prior releases of z/OS and users who have not enabled mixed-case password support (MIXEDCASE / NOMIXEDCASE parameter of the PASSWORD option of the SETROPTS command) **must ensure that the maximum number of lowercase characters be set to zero.** If a value greater than zero is specified, all password changes will be invalidated by this OS/EM function.
- Alpha characters specified in the Password Exclusion Table are processed as both upper and lower case when mixed-case passwords are supported. For example, an excluded password 'BILL' will reject 'BILL', 'bill' and all combinations of upper and lowercase characters.

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Restrict Devices

Description

Restrict Devices provides the option of reserving devices for critical jobs that must complete without waiting for devices to become available. The device is reserved and only the Jobnames that are specified with this option will be able to use the device. Even Operator VARY device commands will not make a restricted device available.

Summary of Features

- Restricts device allocation and usage by Jobname or Jobname masks
- Restricts the console operator from making the device available with a VARY device command
- Automatic REPLY to make the device available for authorized Job or Jobname mask
- Automatically varies the device offline when the authorized Job or Jobname mask has completed

Restrict Devices

```
OS/EM --------------------- RESTRICT DEVICES -------------------- Version 6.1
Command ===>                                                  Scroll ===> CSR


     Restrict Devices Active ===> YES        (Yes/No)

 (CMD = (A)dd (D)elete (G)roup display)
CMD  Device Range    Groups
 '    823  : ____       2

 '    828  : 82F        2

 '    901  : 902        2

 '    905  : ____       2

 '    907  : ____       2

 '    909  : 90B        2

****************************** Bottom of data ********************************
```

Figure 192. Restrict Devices

Field entry is as follows:

1. Add

   To add entries, enter an **A** in the CMD field and **overtype** the **Device Range**, both entries are required. (**Overtyping will not alter the old entry**.)

2. Delete

   To delete entries, enter a **D** in the CMD field.

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Specify Jobname

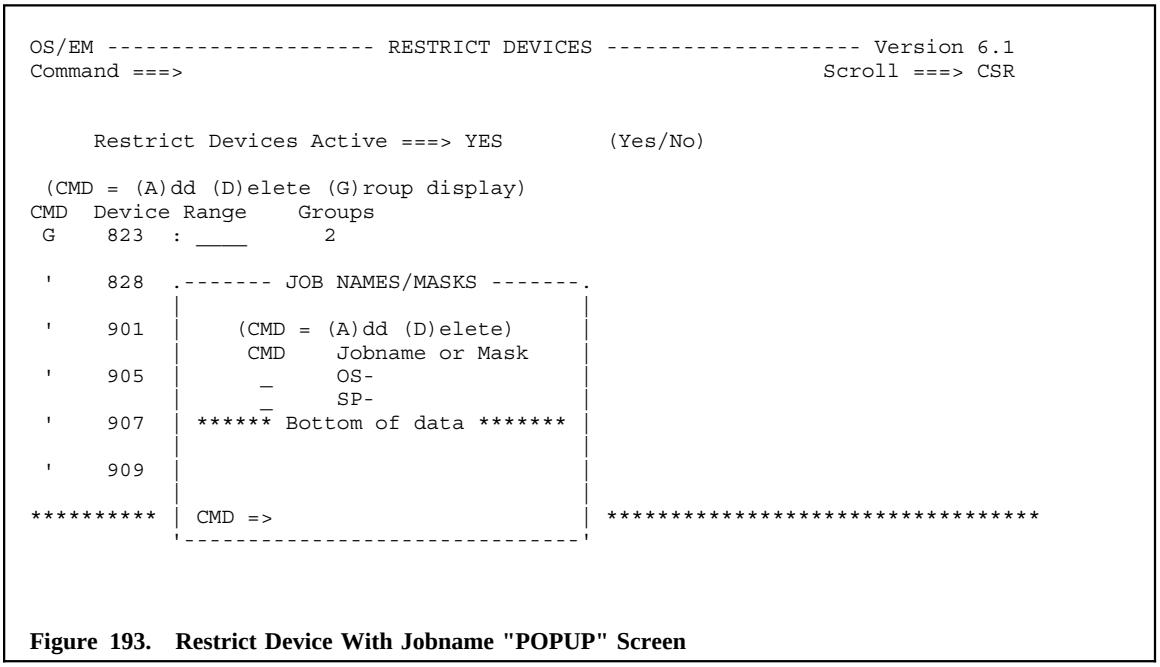

Figure 193. Restrict Device With Jobname "POPUP" Screen

Field entry is as follows:

1. Add

   To add entries, enter an **A** in the CMD field and **overtype** the **Jobname** or **Jobname mask** (**overtyping will not alter the old entry**).

2. Delete

   To delete entries, enter a **D** in the CMD field.

Jobname / Jobname Mask

Masking Characters: The following table shows the allowable mask characters:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

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SVC Controls

Description

The **SVC DELETE/REPLACE** function allows you to delete an SVC so it cannot be executed, or optionally replace it with your own program.

Upon entry to this function you are presented with a scrollable list of the SVCs that have previously been entered, or a blank entry.

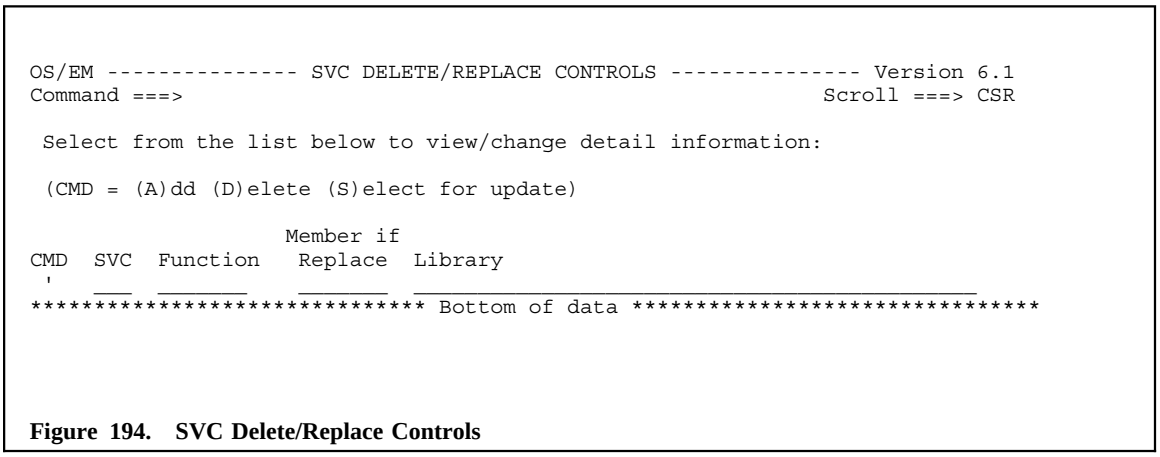

Figure 194. SVC Delete/Replace Controls

The fields and their meaning are:

- CMD

  Three line commands are available:

  A - Add new entry. You can use the **A** command on any line. When you press enter, a blank data entry panel will be displayed (see Figure 195 on page 5-232) to allow you to enter the required information.

  D - Delete an existing entry.

  S - Select for update. When selected, a data entry panel (see Figure 195 on page 5-232) will be displayed to allow information about the SVC to be updated.

- SVC

  The number of the SVC being deleted/overridden.

- Function

  The function being performed, either **DELETE** or **REPLACE**.

- Member if Replace

  The program name which will be loaded in place of the original SVC.

- Library

  The library name the SVC replacement will be loaded from.

The data entry panel contains several required fields depending on the type of SVC being replaced.

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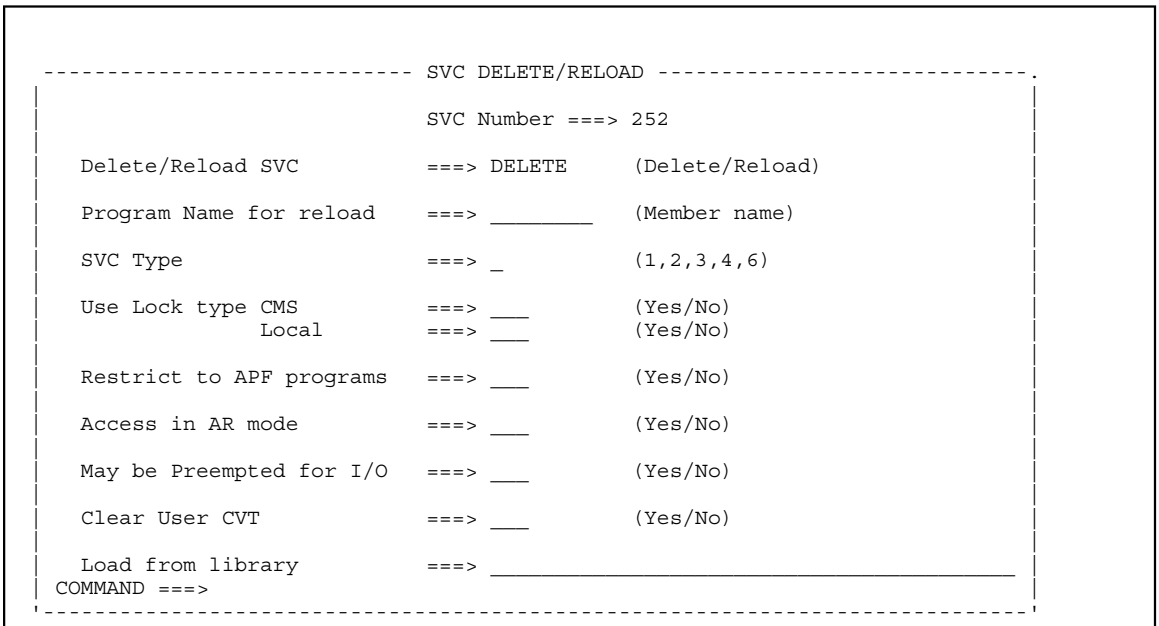

Figure 195. SVC Delete/Reload Entry panel

The fields and their meaning are:

- SVC Number

  If you are adding a new entry, this field is unprotected and you must enter the number of the SVC you are deleting or replacing. If you are updating an existing entry, this field is protected.

- Delete/Replace SVC

  Enter the function you wish to perform. If it is DELETE, no other field should be entered.

- Program Name for replace

  Enter the name of the program which will replace the existing SVC.

- SVC Type

  You must specify the type of SVC you are replacing. Specify 1, 2, 3, 4 or 6.

- Use Lock type CMS/Local

  Specify the type of lock your program needs. If the SVC type is '1', the LOCAL lock is not allowed. If the type is '6', neither type of lock is allowed. If the type is '2, 3 or 4' you MUST specify LOCAL if CMS is specified.

- Restrict to APF programs

  If only APF authorized programs should be allowed to execute this SVC, enter YES.

- Access in AR mode

  Enter YES if the SVC replacement should be accessed in Access Register mode.

- May be Preempted for I/O

  Enter YES to allow the system to preempt your program to handle I/O.

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- Clear User CVT

  Enter YES to have the User CVT field cleared before the SVC is executed.

- Load from library

  Enter the name of the library where the SVC replacement program resides. If this field is left blank, the standard search routines are used to locate the load module. The library name should be enclosed in single quotes (').

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Tape Share Controls

Description

The Tape Share option allows you to define tape drives to OS/EM which will then control the devices by automatically issuing the VARY commands needed to put the drive offline on one system and online on the system where it is needed. No operator intervention is required.

Note: Since Tape Share controls whether a device is online or offline, we suggest that you configure all drives defined to Tape Share to be offline at IPL time.

This optional feature of OS/EM requires a started task to be running on each system sharing tape devices. A sample of the procedure to execute the started task may be found in the OS/EM SAMPLIB in member name FEMTPSHR. The name of the started task must remain FEMTPSHR as OS/EM will issue a start command for this name at IPL time.

Tape Share Controls Menu

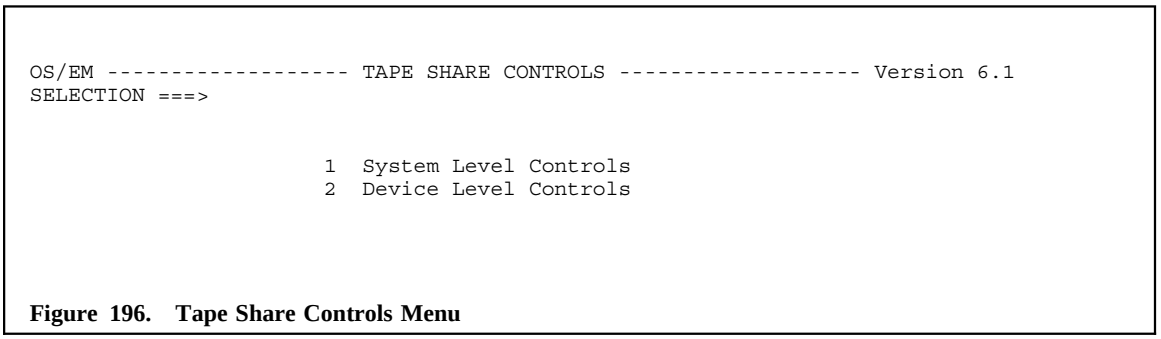

Figure 196. Tape Share Controls Menu

This menu contains entries for both system level and device level control information. Both entries must be selected to initially setup Tape Share Controls.

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System Level Controls

```
OS/EM ---------------- TAPE SHARE SYSTEM CONTROLS --------------- Version 6.1
Command ===>                                                  Scroll ===> CSR

    Tape Share Active   ===> YES        (Yes/No)
      Inactivate Option ===> WAIT       (Global/Remove/Wait)

    Wait Option         ===> NOHOLD     (Hold/Nohold)
    IPL Offline Mode    ===> GLOBAL     (Global/Local)
    IPL Online Mode     ===> LOCAL      (Global/Local)
    Control DSN         ===> 'SYSX.OSEM.TAPESHR2'

    Set System Priority ===> YES        (Yes/No)
      Specify System IDs in Priority Order Below

Primary Command:  (I)nsert  Note:  System IDs in Priority Order
Line Commands:    (D)elete, (I)nsert
SEL   System ID     Comment/Description of System ID
 '    PROD          Production System_____________________
 '    ZULU          Y2K LPAR______________________________
 '    TEST          Test LPAR_____________________________
****************************** Bottom of data ********************************
```

Figure 197. System Level Controls Panel

Use this panel to enter non-specific information about Tape Share Controls. The information on this panel is required before any controls dealing with specific devices become effective.

Field entry is as follows:

1. Tape Share Active

   Enter **YES** to turn on Tape Share, or **NO** to disable Tape Share on the current system.

2. Inactivate Option

   Specify the action to be taken when Tape Share Controls are deactivated. Enter one of the following:

   - Global

     This will cause OS/EM to issue a **VARY OFFLINE,GLOBAL** command for all active devices in the tape share pool on every system which has Tape Share Control's active.

   - Wait

     This will cause OS/EM to wait until every device in the pool becomes free before disabling Tape Share Controls on the current system.

   - Remove

     This will cause OS/EM to immediately remove the devices from the pool on all systems.

3. Wait Option

   Specify the action to be taken if resources are unavailable and the job is placed into a wait state. Specify one of the following:

   - Hold

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Retain all resources currently allocated.

- Nohold

  Any resources currently allocated when the job is placed into a wait may be released and allocated to another task.

4. IPL Offline Mode

   Cause the devices selected on the Device Level Controls panel to be taken offline at IPL time.

   - Local

     The OFFLINE command will only affect the system the command is executed on. Other systems will not be affected.

   - Global

     The OFFLINE command will affect all systems sharing the specified devices.

5. IPL Online Mode

   Cause the devices selected on the Device Level Controls panel to be marked available at IPL time.

   - Local

     The ONLINE command will only affect the system the command is executed on. Other systems will not be affected.

   - Global

     The ONLINE command will affect all systems sharing the specified devices.

   Note: Does **not** issue a **VARY** command to bring the device(s) online.

6. Control DSN

   Specify the dataset name which will be used as the communications dataset. This file must be on shared DASD available to all systems sharing tape drives. Enter the dataset name using standard TSO naming conventions, i.e. if apostrophes do not enclose the dataset name, your TSO ID will be appended to the beginning of the entered name.

   Note: The dataset must have the following attributes:

   ```
   RECFM=F,LRECL=29080,DSORG=PS
   ```

   One track will be sufficient space.

7. Set System Priority

   Enter either **YES** or **NO** depending upon your need to specify system priorities. If you specify YES here, you must also enter the system names in the scrollable portion of the panel.

   If you have previously specified system names to set priorities, you do not need to remove them when changing this response to NO.

The bottom portion of this panel contains a scroll area. This is used to store the system names/IDs in priority order. Initially this list is empty and you must use the **Insert** primary command to enter the first entry.

There are two line commands available:

- Delete

  Use this line command to delete an entry no longer needed.

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- Insert

  This will cause a popup window to open for entry of the system ID and an optional description of the system. After the fields are completed, press the enter key to have the new system added after the line where the insert line command was entered.

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Device Level Controls

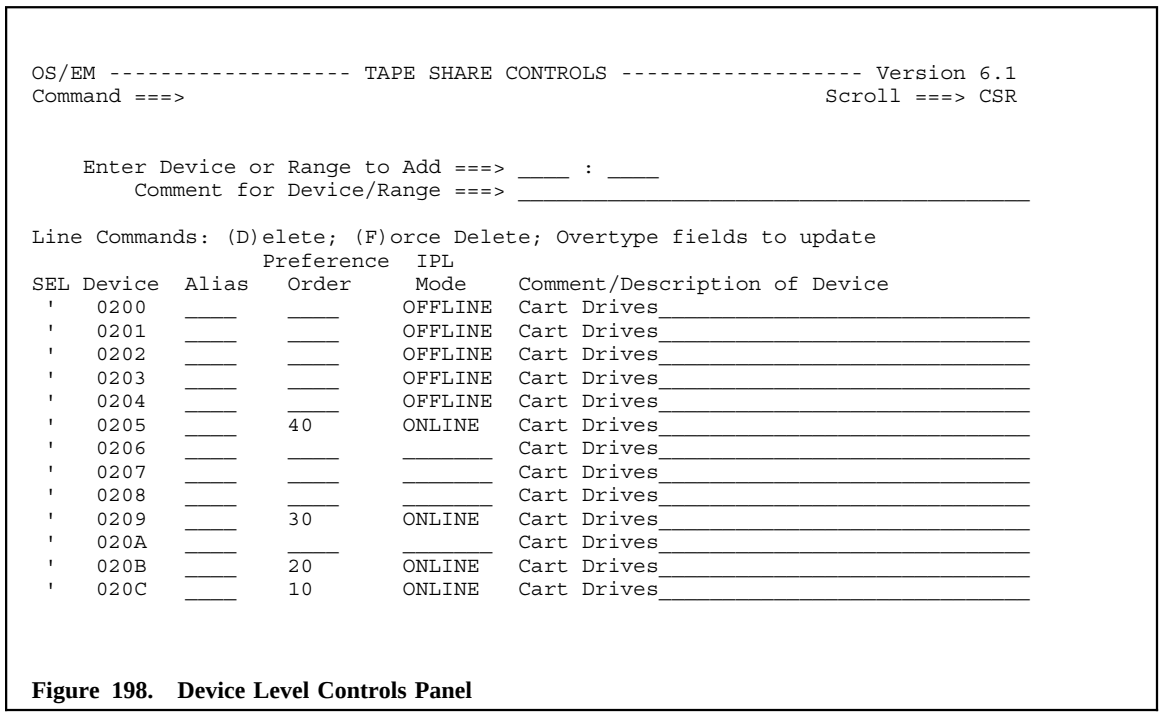

Figure 198. Device Level Controls Panel

Use this panel to enter information about specific tape device addresses. The system level controls must be completed for this information to be used.

Field entry is as follows:

1. Enter the address of a tape device to be placed into the tape share pool. A range of addresses may also be entered.

2. Enter a comment for the device or device range. This is an optional field, and is only used for documentation purposes.

3. Press the **enter** key to have the device or device range entered into the scrollable list in the bottom portion of the panel.

After the device addresses are in the scrollable list, you may assign **alias** entries, assign a **preference order** of use, and the **mode** the device will be placed in at IPL time. To change any of these entries, simply overtype the field to be added or changed and press the enter key.

Following is an explanation of each of these optional items.

Alias
Used if all systems do not refer to a device with the same address. In this case, a global name is assigned that all systems will use, and the machine which has a different address will use the ALIAS keyword to bind the local address to the global address.

Preference Order
The order in which the drives will be assigned. Lowest number to highest number. It is suggested that you enter numbers at least 10 apart to allow other drives to be added into the order at a later date.

IPL Mode
Enter either **ONLINE** or **OFFLINE** to specify the mode the drives will be placed in at IPL time.

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If specified, the global or local option entered on the systems controls menu will be used for that address.

Line Commands

Use the **D**elete command to remove devices from Tape Share's control. The Delete command will wait for the device(s) to become unallocated. Use the **F**orce Delete command to remove the device from Tape Share's control immediately. Tape Share will **not** wait for the device to become unallocated.

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Time Controls

Description

Time Controls provides the option of enforcing CPU time limitations, extending CPU time, JOB wait time, and TSO wait time as well as controlling by job class the insertion of a missing time parameter, overriding the time specified on the jobcard, or canceling the job if job time is greater than the JES2 time value.

Summary of Features

- Insert a missing time parameter
- Reset the jobcard's time parameter to match JES, or optionally cancel the job.
- Set CPU time limits by JOBCLASS
- Extend CPU time limits by JOBCLASS
- Extend SMF wait time by JOBCLASS (Avoid S522 for slow tape mounts and Operator replies)
- Re-issue Tape mount messages to Operator Console
- Check for Tape mount failures and send notification messages to Operator Console
- Extend SMF wait time for TSO users by USERID and/or Terminal ID mask for certain days of the week and time of day (good for session managers)

Time Controls Menu

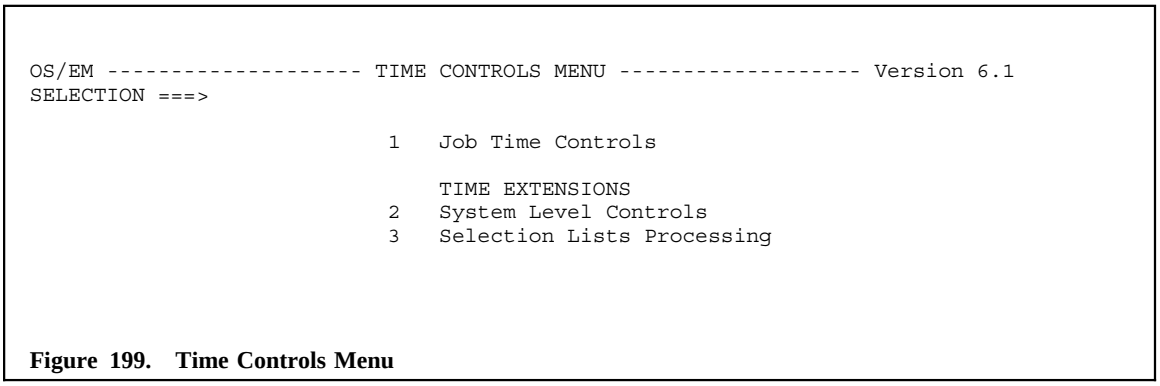

Figure 199. Time Controls Menu

Each of these paths is presented in the following sections:

1. Job Time Controls (see “Job Time Controls” on page 5-241)
2. System Level Controls (see “Time Extensions System Level Controls” on page 5-243)
3. Selection Lists Processing (see “Selection Lists Processing” on page 5-245)

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Job Time Controls

The JOB TIME function allows you to control by job class the insertion of a missing time parameter, override the time specified on the jobcard or optionally cancel the job for incorrect time values.

You also have the option of cancelling **all** jobs coming into the system which do not have a time specified. This option takes precedence over the **Insert Missing** by job class function.

For each job class selected the following processing occurs:

- If Insert time parameter is active and the jobcard does not have the time parameter coded, the job's time limit is set to match the time specified for that class in JES2.
- If Reset MAXIMUM is active and the jobcard has TIME=MAXIMUM coded, execution time is reset to match the time specified for that class in JES2.
- If Reset NOLIMIT is active and the jobcard has TIME=NOLIMIT or TIME=1440 coded, execution time is reset to match the time specified for that class in JES2.
- If Reset if HIGH is active and the jobcard's time parameter is set higher than the time specified in JES2 for that class, the execution time is reset to match that specified in JES2.
- If Reset if LOW is active, and the jobcard's time parameter is set lower than that specified in JES2, the execution time is reset to match JES2.

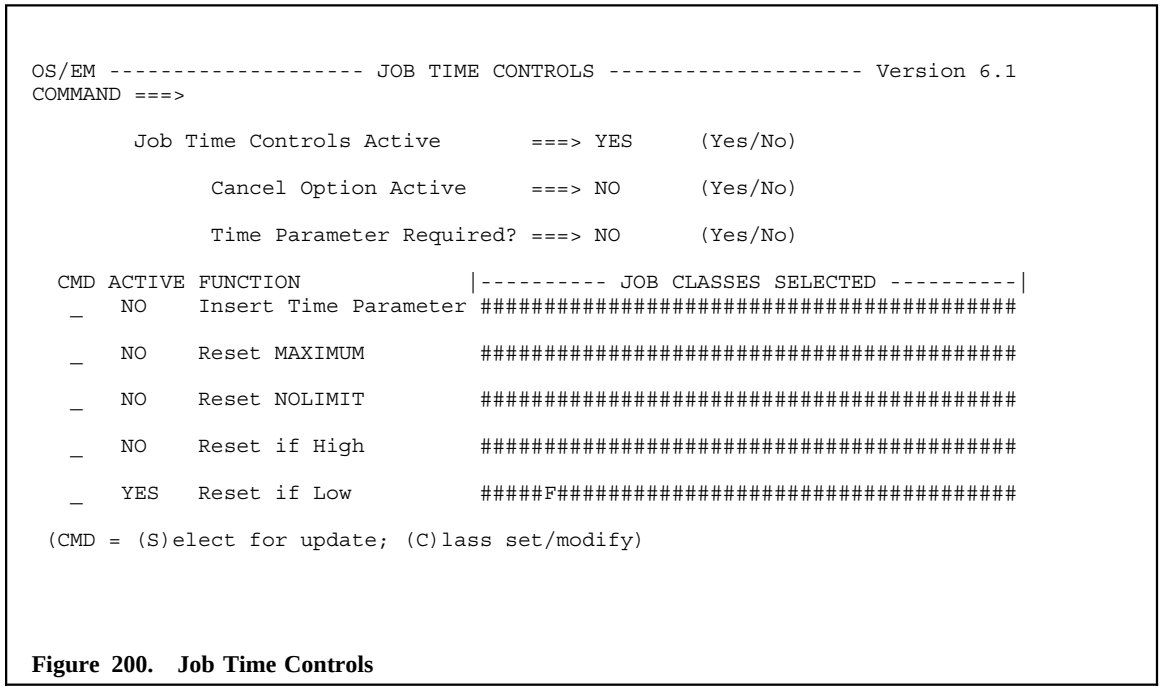

Figure 200. Job Time Controls

The fields and their meaning for this input panel are:

- Job Time Controls Active

  This field allows you to turn off Job Time Controls without having to disable each function type individually.

- Cancel Option Active

  When this option is selected, any job trying to increase its allowable job time will be flushed instead of having its job time simply reset.

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- Time Parameter Required?

  This option insures that every job coming into the system contains a time parameter, regardless of the class the job is submitted in. When this option is active, if the time parameter is missing, the job is flushed. This option takes precedence over the **Insert Missing** by class option.

The above example shows that all classes will have their job time set if the time parameter is missing on the jobcard; Classes A,B,C,D and E will reset the time if the jobcard has TIME=MAXIMUM coded; classes N, O and P will be reset if the job has TIME=NOLIMIT or TIME=1440; classes 4, 5, and 6 will have their time reset if the time parameter is greater than that specified in JES2; class X will be reset only if the job's time parameter is set lower than that specified in JES2.

The '#' symbol represents a class available for use.

Two line commands are available:

S Select for update; use this to change the Active indicator from YES to NO.

C Class set/modify; when you use this line command, a popup window will open (see Figure 201) allowing you to specify or change the classes for the selected function. On the popup window, you may specify the classes in a range, i.e. A:D will activate the function for classes A, B, C and D.

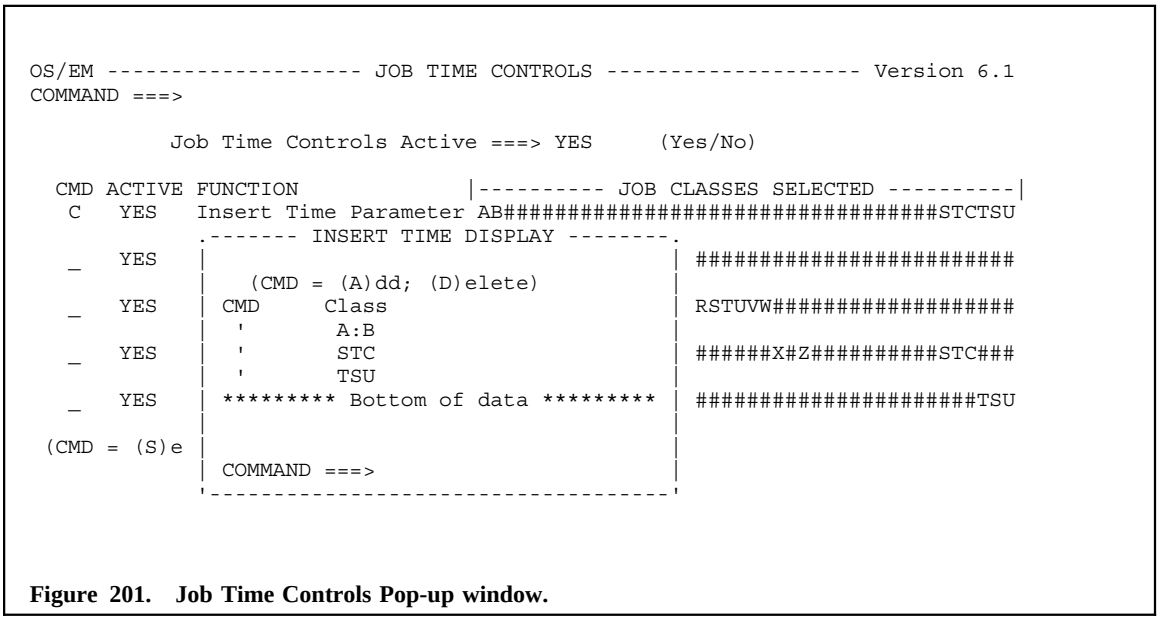

Figure 201. Job Time Controls Pop-up window.

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Time Extensions System Level Controls

OS/EM provides support to extend execution time at both the job and step level. It also allows you to extend wait time for batch jobs, TSO users and/or terminals.

For both step and job CPU time, you may specify individual job classes or all classes to be given the default time extension. You can specify time extension by class which is different than the default time. You may also request OS/EM issue a WTO every time an extension is given.

To ensure that a job is not overlooked while extensions are being given, a WTOR may be issued every 1 to 99 times an extension is granted.

Wait time extensions may be granted by job class, and for TSO activity, by user ID, terminal ID and active hours by day of week.

If both job and step time has been exceeded at the same time, it is unpredictable which indicator will be presented to OS/EM first. Because of this, it is suggested that you setup extensions for both job and step CPU times.

Screen Figure 202 shows where RACF information, default time information and selection weights are entered.

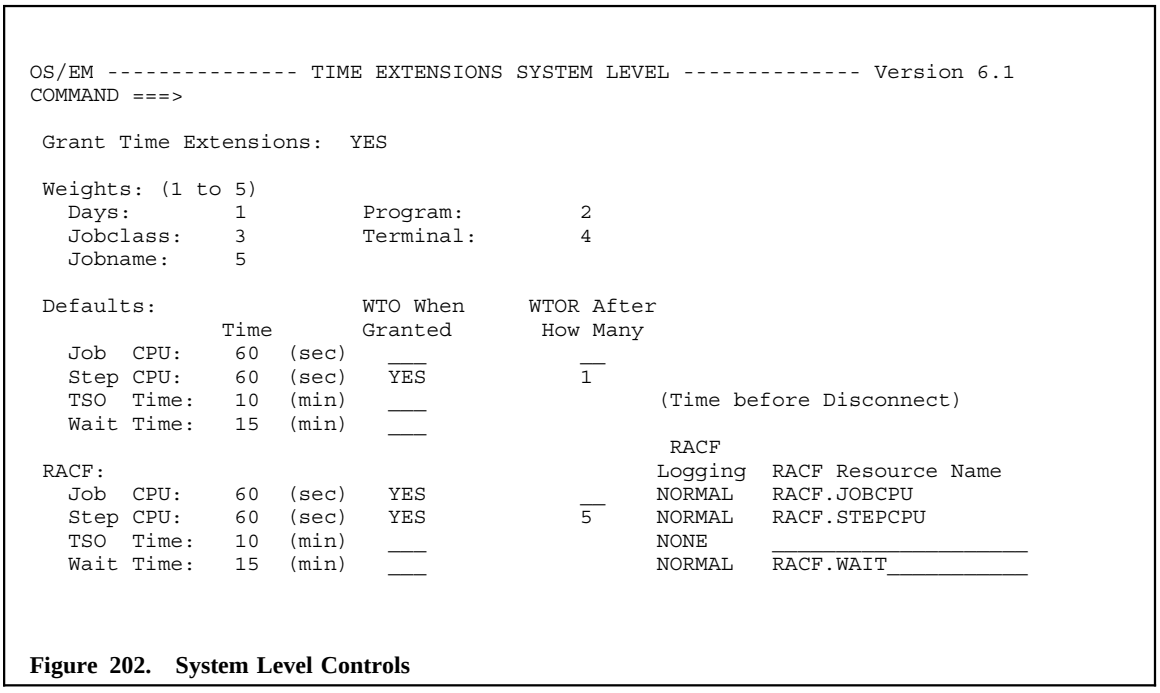

Figure 202. System Level Controls

The fields and their meanings are as follows:

- Extension Controls Active

  Enter **YES** or **NO** to activate or inactivate extension controls.

- Weights:

  There are 5 weight classes:

  1. Days
  2. Jobclass
  3. Jobname

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4. Program

5. Terminal

   Enter a number from 1 to 9 for each selection criteria type. The higher the number the more weight that is given to that selection type. In other words, if a job that is running matches multiple extension groups, the group with the highest weight will take effect.

The defaults block is where you can specify extension time that will take effect if no extension group matches a given job or userid.

- Job CPU Time
- Step CPU Time
- Wait Time

  Specify the number of seconds a job and/or step should be given and the number of minutes of wait time a job/user/terminal may receive.

- WTO when Granted

  To have a WTO issued each time an extension is granted, enter **YES** here.

- WTOR After How Many

  To have a WTOR issued to allow the operator to either cancel a job or allow another extension, enter the number of extensions that may be granted before a WTOR is issued. Enter a number from 1 to 99.

  Note: While OS/EM is waiting for an operator response the job will continue to execute. This was a design decision by IBM.

The RACF block is where you can specify extension time that will take effect for any job/user/terminal which matches an entry in the specified RACF resource. This block takes precedence over the normal defaults or an extension group.

The Time, WTO and WTOR fields are identical to the defaults block. The RACF block has two additional fields:

- RACF Logging

  Enter either **NORMAL** or **NONE** to control RACF logging.

- RACF Resource Name

  Enter the name of the resource you have assigned to control Time Extensions. This resource must be defined in the general resource FACILITY class for RACF and CA-ACF2 or the IBMFAC class for CA-Topsecret. Users to be given extensions must have READ access to this profile.

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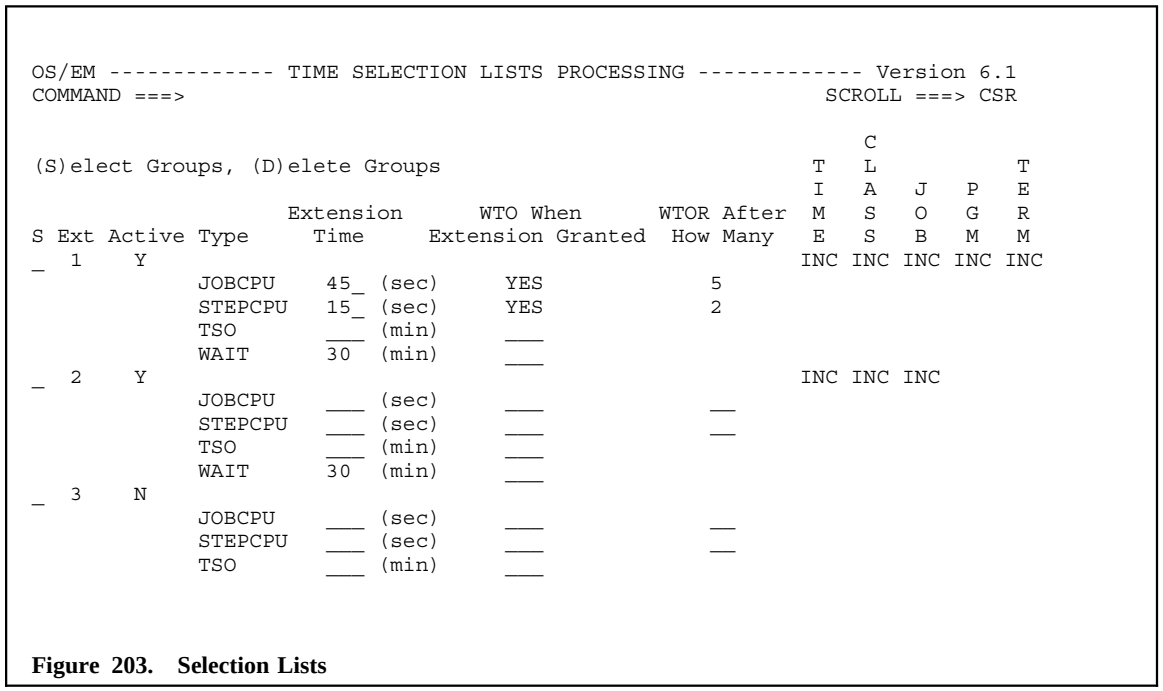
Selection Lists Processing

The Time Extension Controls panel lists the 32 available extension groups. Each group will have at least one list of job classes, job names, program names, terminal IDs, or time of day to control which extension is granted to whom.



```
OS/EM ------------- TIME SELECTION LISTS PROCESSING ------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

                                                                    C
(S)elect Groups, (D)elete Groups                                T   L           T
                                                                I   A   J   P   E
                    Extension      WTO When      WTOR After     M   S   O   G   R
S Ext Active Type     Time     Extension Granted  How Many      E   S   B   M   M
_  1    Y                                                      INC INC INC INC INC
             JOBCPU    45_ (sec)     YES             5
             STEPCPU   15_ (sec)     YES             2
             TSO       ___ (min)     ___
             WAIT      30  (min)     ___
_  2    Y                                                      INC INC INC
             JOBCPU    ___ (sec)     ___             __
             STEPCPU   ___ (sec)     ___             __
             TSO       ___ (min)     ___
             WAIT      30  (min)     ___
_  3    N
             JOBCPU    ___ (sec)     ___             __
             STEPCPU   ___ (sec)     ___             __
             TSO       ___ (min)     ___
```

Figure 203. Selection Lists

Extension 1 shown in Figure 203 is active. A job level time extension of 45 seconds will be granted. Each extension will have a message written to the operator. After 5 extensions, a WTOR will be issued to allow the operator to cancel the job if necessary. A step level extension of 15 seconds will also be given. Again a WTO will be issued at each extension and a WTOR will be issued after 2 extensions. Wait time will be extended by 30 minutes, and a WTO will **not** be issued when the extension is granted.

There are 5 active selection lists for Extension 1:

1. The Time of Day list contains the days and hours within that day that WAIT extensions will be granted. This list is always an include list.

2. The Class list contains the job classes which may have the execution time extended, if it is an include list, or the classes which will not have execution time extended in the case of an exclude list.

3. The Name list contains job names and/or TSO IDs. An include list will have the names of jobs which may have their execution and wait time extended or the TSO IDs which may have their wait time extended. An exclude list will contain the names of jobs and/or TSO IDs which may not be extended.

4. The PGM list contains program names. Again, an include list will contain programs which may be extended, and the exclude list contains programs which will not be extended while all other programs will be.

5. The terminal list contains terminal addresses. An include list contains the addresses of terminals which may have their wait time extended. The exclude list contains terminals which may not be extended, while all others will be.

There are two line commands available: **S** to add/update selector entries and **D** to remove all selector entries and clear the selection list of time and WTO values.

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When the line command is processed, another panel Figure 204 on page 5-246 is displayed where you may select any of the lists for update as well as change the list type between include and exclude. The Days list is always an include list.

```
OS/EM ------------------------ SELECTOR ENTRY - 1 --------------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

Enter Selector Types, either Include or Exclude
               Jobclass ===>             Jobname  ===> INCLUDE
               Pgmname  ===> INCLUDE     Terminal ===>

 Line Cmds: (D)elete line, (I)nsert line

   Selector
     Type     Selector Names/Mask List
_  JOBNAME    PCEDI
_  PGMNAME    IKJEFT01
_  MONDAY     0001:2400
_  TUESDAY    0001:2400
_  WEDNESDAY  0001:2400
_  THURSDAY   0001:2400
_  FRIDAY     0001:2400
_  SATURDAY   0001:2400
_  SUNDAY     0001:2400
****************************** Bottom of data ********************************
```

Figure 204. Selector Entry Panel

The **selector entry** panel allows you to enter the criteria that will be used to select a job that will have its time adjusted.

There are five types of selectors:

JOBCLASS Enter the jobclasses that the job being evaluated must match if this is an include type list, or the classes which the job must not match for an exclude list.

The jobclasses may be entered individually separated by spaces or as a range where the beginning class and ending class is separated by a colon (:).

JOBNAME Enter any jobnames either as complete names or as a jobname mask. Separate the names or masks with a space. Enter as many names/masks as will fit on the line. If additional names need to be entered simply insert a blank line and enter the selector type as JOBNAME and continue entering names or masks.

PGMNAME Enter any program names either as complete names or as a program name mask. Separate the names or masks with a space. Enter as many names/masks as will fit on the line. If additional names need to be entered simply insert a blank line and enter the selector type as PGMNAME and continue entering names or masks.

TERMINAL Enter any terminal IDs as the complete ID or as a mask. Separate the IDs or masks with a space. Enter as many IDs/masks as will fit on the line. If additional IDs need to be entered simply insert a blank line and enter the selector type as TERMINAL and continue entering IDs and or masks.

Day of Week Use the day of week you need to specify a time range as the selector type then in the Selector Names/Mask List field enter the beginning and ending times separated by a colon (:) using the 24 hour time format. Only one time range is allowed per day.

If you want the control to be active on Monday between 8AM and 5PM enter the selector type as MONDAY then enter 0800:1700 in the list field.

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Query OS/EM Status

The QUERY function displays the state of the OS/EM environment.

The ALL and ACTIVE options are mutually exclusive. If you select no options, ACTIVE is assumed.

The output of the QUERY command is to a dataset that will be browsed by the ISPF BROWSE function. When you have finished viewing the output, the END key will exit the browse function.

The SMF, TSO, DASD, ALLOC, RACF, JES2, JES3, HSM and ISPF options can be limited to a specific exit point by entering its name in the supplied field. If the exit does not exist, an error will be returned.

To limit the display of JES2 exit information, you may enter the name of the JES2 subsystem to be displayed in the JESNAME field. If left blank, all JES2 subsystems will be displayed.

The POOL display may be limited to Data Set Name Groups (DSN), Volume Name Groups (VOL), or QuickPool definitions (POOL).

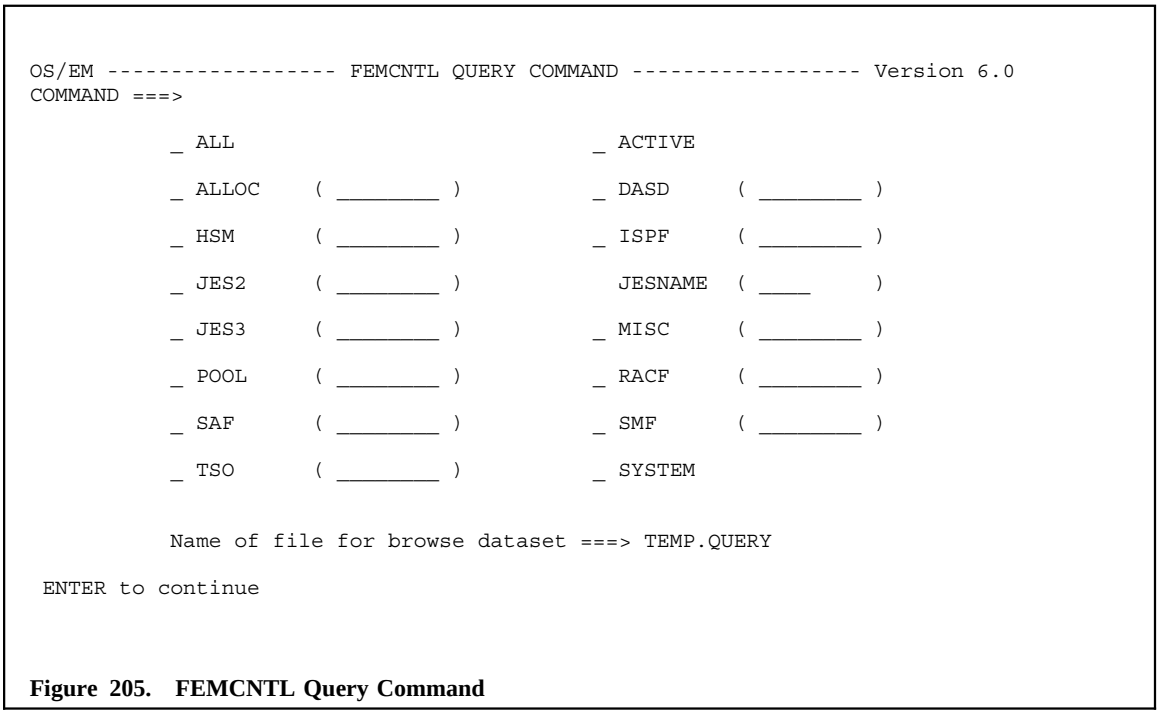

Figure 205. FEMCNTL Query Command

To select a QUERY option, from specific to ALL, enter an **S** before the QUERY option.

When the query has completed you will be placed into BROWSE to view the results. Below is a sample of the first page of generated output for the SMF IEFACTRT exit.

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```
   Menu  Utilities  Compilers  Help
 ______________________________________________________________________________
 BROWSE    HEJT2.OSEM.QUERY                          Line 00000000 Col 001 080
 Command ===>                                          Scroll ===> CSR
******************************** Top of Data ********************************

OS/EM VER: 6.1 TIME: 12:16:54 DATE:  2/01/2006 SYSPLEX: ADCDPL   SID: P390


 SMF DATA
  NOTIFY: <NONE>

  IEFACTRT - EXIT IS ENABLED
   VALID RETURN CODES: (DEFAULT) ANY
   GOOD RETURN CODES: (DEFAULT) 0
   DISABLING RETURN CODES: (DEFAULT) NONE
   DEFAULT RETURN CODE: (DEFAULT) 0
   OS/EM EXIT - CALLED FIRST - NOTIFY: <NONE>
    EXIT (FEMACTRT) - PTF HOSM610 2006-01-27 20:17:45
     ADDR: 083AFDB0 EP: 883AFDB0 - SOURCE: OSEM
      LNKLIB: SYSX.OSEM.LINKLIB
```

Figure 206. Sample Query Output

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Reload Exits

Selection Menu

Use of this screen will result in the generation of RELOAD commands for the optional OS/EM control functions, and for the various OS/EM interface modules.

You would not normally reload these modules unless you had applied maintenance to the OS/EM system. Instructions with the OS/EM maintenance tape will indicate if any of these modules have to be reloaded.

```
OS/EM -------------- SELECT MODULE TYPE FOR RELOAD -------------- Version 6.1
COMMAND ===>

                      1 - JES2 User Modules
                      2 - JES3 User Modules
                      3 - MVS  User Modules
                      4 - OS/EM System Modules
                      5 - RACF tables
```

Figure 207. Module Type Reload Selection

Each of these paths is presented in the following sections:

1. JES2 User Modules (see “JES2 Exits User Modules” on page 7-2)
2. JES3 User Modules (see “JES3 Exits User Modules” on page 7-3)
3. MVS Exits User Modules (see “MVS Exits User Modules” on page 7-4)
4. OS/EM System Modules (see “OS/EM System Modules” on page 7-5)
5. RACF Tables (see “RACF Tables” on page 7-6)

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JES2 Exits User Modules

The JES2 Reload Selection panel displays all of the active JES2 exits. Scroll through this list to find the exit(s) which need to be reloaded.

The list of user exits displayed is controlled by the active JES2 subsystem. Please use **Option 6 - Set JES name** to select the active JES2 subsystem name. (See "Set JES2 Name" on page 8-1)

```
OS/EM -------------------- JES2 - EXIT RELOAD SELECTION --------- Version 6.1
COMMAND ===>                                                  SCROLL ===> CSR

(S)elect for Reload

             Primary Exit:EP
 Exit Point   /Backup Exit:EP     Load Library
EXIT000   '  HASPXIT0 : EXIT00    _____________________________________________
          '           :          _____________________________________________
EXIT000   '  HASPXIT0 : EXIT01    _____________________________________________
          '           :          _____________________________________________
EXIT000   '  HASPXIT0 : EXIT02    _____________________________________________
          '           :          _____________________________________________
EXIT000   '  HASPXIT0 : EXIT03    _____________________________________________
          '           :          _____________________________________________
****************************** Bottom of data ********************************
```

Figure 208. JES2 Reload Selection

The scrollable list presented shows all the primary and backup user exits which have been defined using the ISPF Interface. Select any exit which needs to be reloaded by placing an **S** before the exit name. You may optionally specify or change the load library where the exit to be reloaded resides. The library name should be enclosed in single quotes (').

After pressing the enter key to register your selections, the exits are removed from the display.

If an exit has been **selected in error**, enter the **cancel command** to exit the selection list without reloading the exits.

The reload commands are generated and executed when you exit the selection list.

Note: If you need to reload an exit which has not been defined to the ISPF Interface, you will need to define it before it will be displayed in this list. This includes exits which OS/EM finds and loads at IPL time. You may wish to use the REBUILD function (see "Rebuild OS/EM Tables" on page 3-9) which will find and add all currently loaded user exits to the interface.

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JES3 Exits User Modules

The JES3 Reload Selection panel displays all of the active JES3 exits. Scroll through this list to find the exit(s) which need to be reloaded.

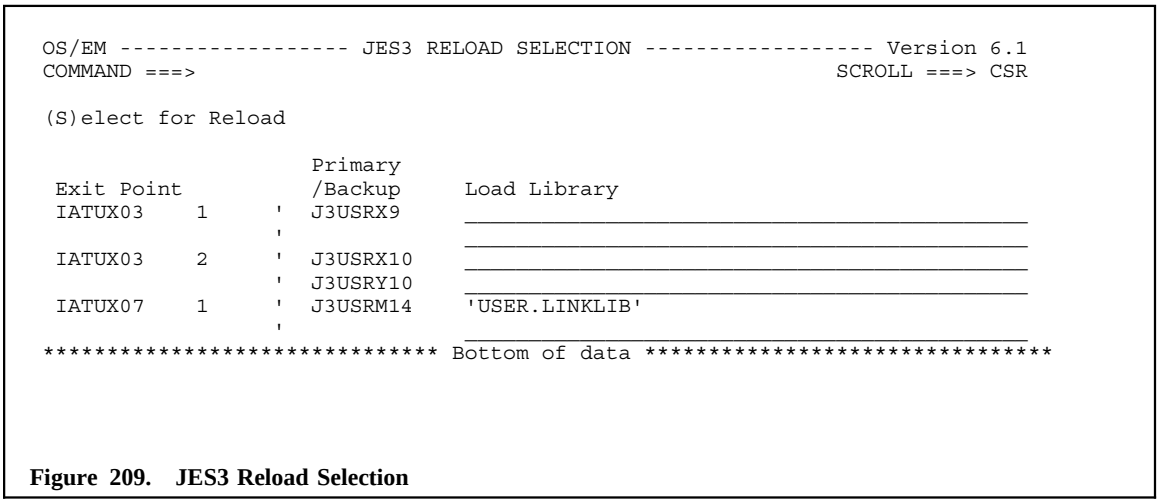

Figure 209. JES3 Reload Selection

When an exit is found, enter an **S** in front of the module name and press enter. You may **change** or **add** the **library name**. The library name should be enclosed in single quotes (').

Changes made here are not saved. To make any needed changes permanent, make the changes through the "Basic Exit Functions" on page 4-1.

If an exit has been **selected in error**, enter the **cancel command**.

The reload commands are generated and executed when you exit the selection list.

Note: If you need to reload an exit which has not been defined to the ISPF Interface, you will need to define it before it will be displayed in this list. This includes exits which OS/EM finds and loads at IPL time. You may wish to use the REBUILD function (see "Rebuild OS/EM Tables" on page 3-9) which will find and add all currently loaded user exits to the interface.

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MVS Exits User Modules

The MVS Reload Selection panel displays all of the active MVS exits. Scroll through this list to find the exit(s) which need to be reloaded.

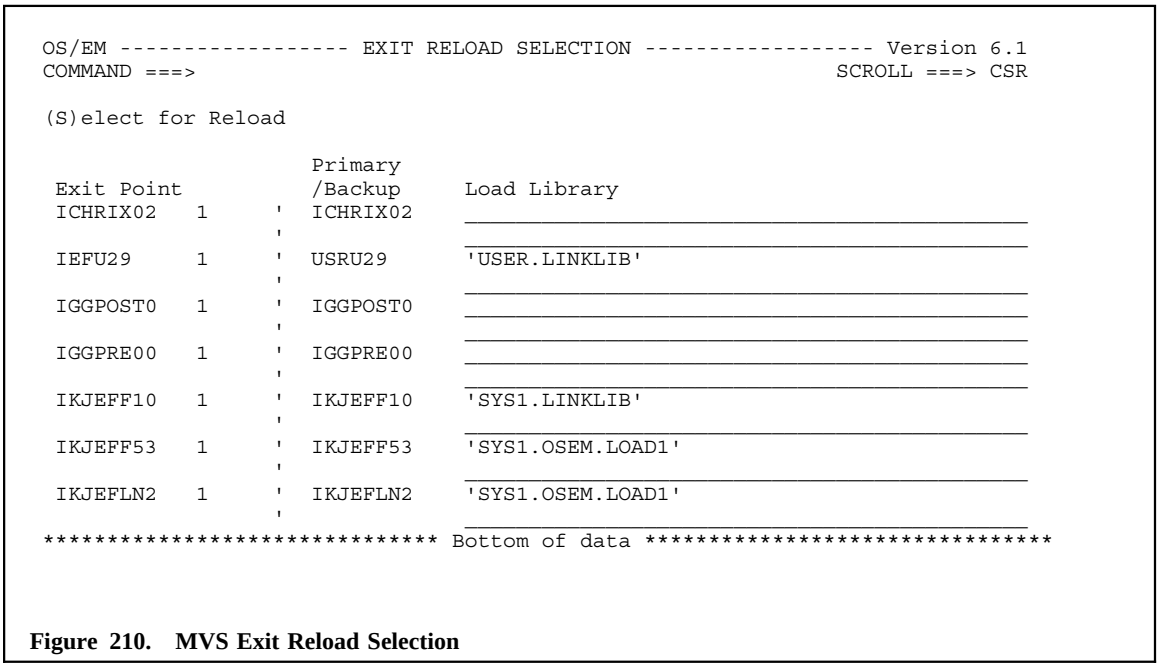

Figure 210. MVS Exit Reload Selection

When an exit is found, place an **S** in front of the module name and press ENTER. You may add or change the load library where the module to be reloaded resides. The library name should be enclosed in single quotes (').

Changes made here are not saved. To make any needed changes permanent, make the changes through the “Basic Exit Functions” on page 4-1.

If an exit has been **selected in error**, enter the **cancel command**.

The reload commands are generated and executed when you exit the selection list.

Note: If you need to reload an exit which has not been defined to the ISPF Interface, you will need to define it before it will be displayed in this list. This includes exits which OS/EM finds and loads at IPL time. You may wish to use the REBUILD function (see “Rebuild OS/EM Tables” on page 3-9) which will find and add all currently loaded user exits to the interface.

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OS/EM System Modules

The System Reload Selection panel displays all of the active System exits. Scroll through this list to find the exit(s) which need to be reloaded.

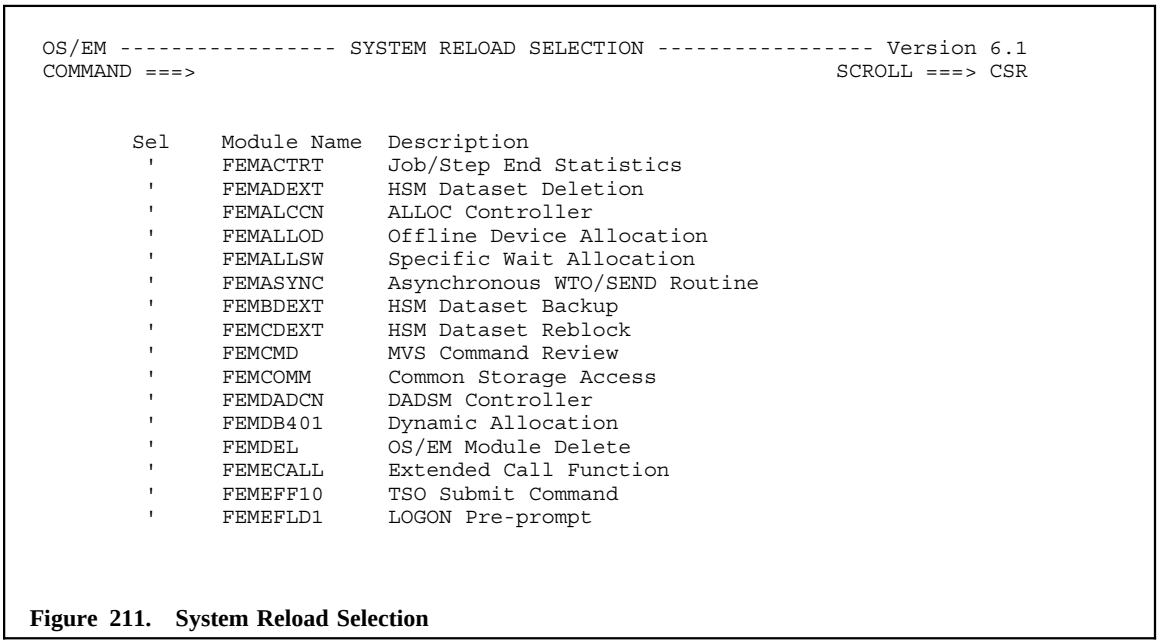

Figure 211. System Reload Selection

When an exit is found, enter a **S** in front of the module name and press ENTER.

If an exit has been **selected in error**, enter the **cancel command** which will cancel all system reload processing. Reselect the OS/EM System Modules to re-specify the correct system modules to be reloaded.

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RACF Tables

The RACF Tables Reload Selection panel displays the three RACF Tables available to be reloaded.

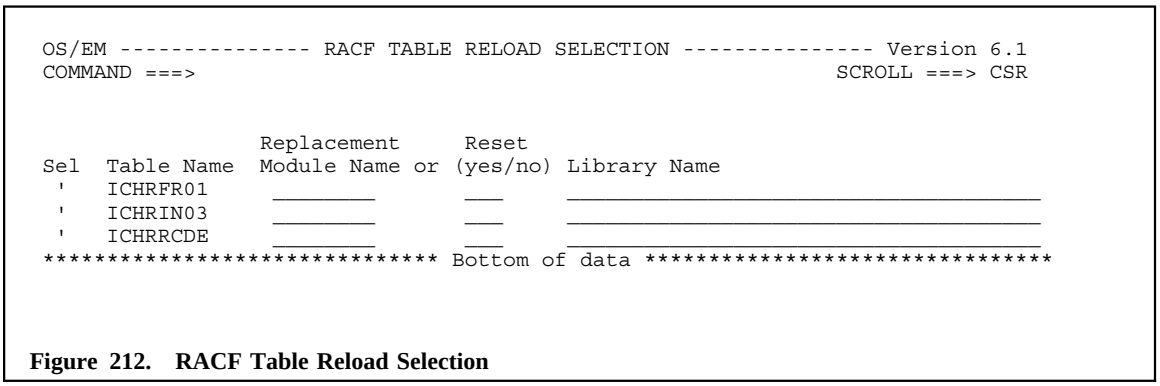

Figure 212. RACF Table Reload Selection

To cause a table to be reloaded, place an **S** in front of the module name. If you are replacing the table with another module, enter the module name in the field provided. If you just want to reset the module, leave the replacement module name blank and enter YES in the reset field.

An optional library name may also be specified. This library must be APF authorized. The library name should be enclosed in single quotes (').

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Set JES2 Name

This function defines the primary and any secondary JES2 subsystems that OS/EM will control. It is also used to select the active JES2 subsystem. The JES2-related controls that are displayed and/or set in the ISPF dialog affect the active JES2 subsystem.

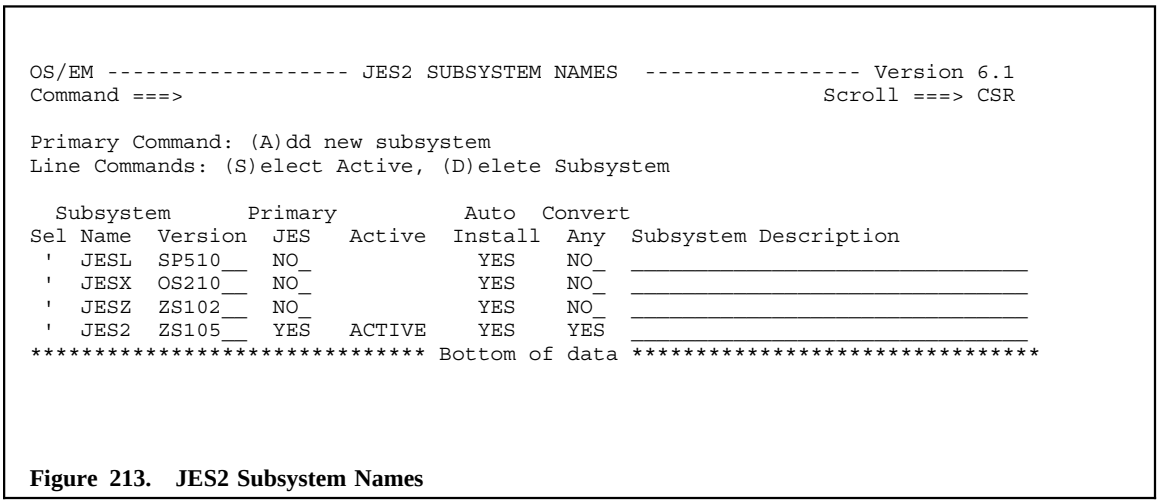

Figure 213. JES2 Subsystem Names

This panel shows:

- **The JES2 subsystem names** that have been defined to OS/EM.
- **The JES2 version** of the defined JES2 subsystems.

  - OS270
  - OS280
  - OS210
  - ZS102
  - ZS104
  - ZS105
  - ZS106
  - ZS107
  - ZS108
  - ZS109

  This value must match the JES2 release level for the secondary JES2 subsystems. This field is ignored for the primary JES2 subsystem (the release is determined at initialization time).

- **The primary / secondary status of the JES2 subsystem** - (YES indicates primary status). Only one subsystem can be the primary JES2.
- **The active JES2 subsystem** - this is the JES2 subsystem that will be managed by the OS/EM ISPF interface for JES2-related functions.

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- **The Auto Install option** - if active (i.e. YES), the user exits defined in the JES2 initialization parameters (i.e. MODULE & EXIT control statements) will be automatically loaded and managed by OS/EM.

  If Auto Install is set to NO, OS/EM will ignore all LOADMOD and EXIT statements in the JES2 initialization parameters and will leave them to be processed by JES2. This will result in the exits defined in the JES2 initialization parameters to be outside the control of OS/EM.

- **The Convert Any option** - controls where jobs will be converted. NO (the default) will force jobs to be converted on the same system that the job is read in. YES will allow jobs to be converted on any eligible system in the MAS.

  It is recommended that all members in the MAS have the same Convert Any setting.

  Note: Jobs with a system affinity assignment (i.e. a /*JOBPARM SYSAFF= control statement) will be converted on the target system, regardless of the Convert Any setting).

- **The subsystem description** - this is an optional field for documentation purposes only.

The Version, Primary JES, AutoInstall, Convert Any and Subsystem Description fields may be changed by simply overtyping whatever is there.

There are three line commands available on this panel:

S Selects the active subsystem. All OS/EM entries processed through the interface which affect JES2 will be processed against this subsystem name.

D Deletes the JES2 subsystem entry.

A Adds a new JES2 subsystem entry. (This can also be entered in the primary command line).

When the **A** command is entered, the following panel will be displayed.

```
OS/EM ---------------------- ADD JES2 NAME ---------------------- Version 6.1
COMMAND ===>

 Specify your JES2 sub-system name and optionally a description of the system.

 JESNAME ===>          Description ===> ____________________________________________

 Primary JES      ===> NO         (Yes/No)

 JES version      ===>            (Required for secondary JES)

 AutoInstall      ===> YES        (Yes or No)

 Convert Any Job  ===> NO         (Yes or No)
```

Figure 214. Add JES2 Subsystem

All fields have the same function as described in the JES2 subsystem selection panel.

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Execute Pending Changes

This facility allows the user to dynamically implement changes made to the OS/EM functions.

Changes made to the OS/EM panels are not automatically implemented in the OS/EM environment. All changes are logged and the Execute Pending Changes function is used to implement changes immediately.

When the Execute Pending Changes function is entered, a scrollable list of the changes is presented.

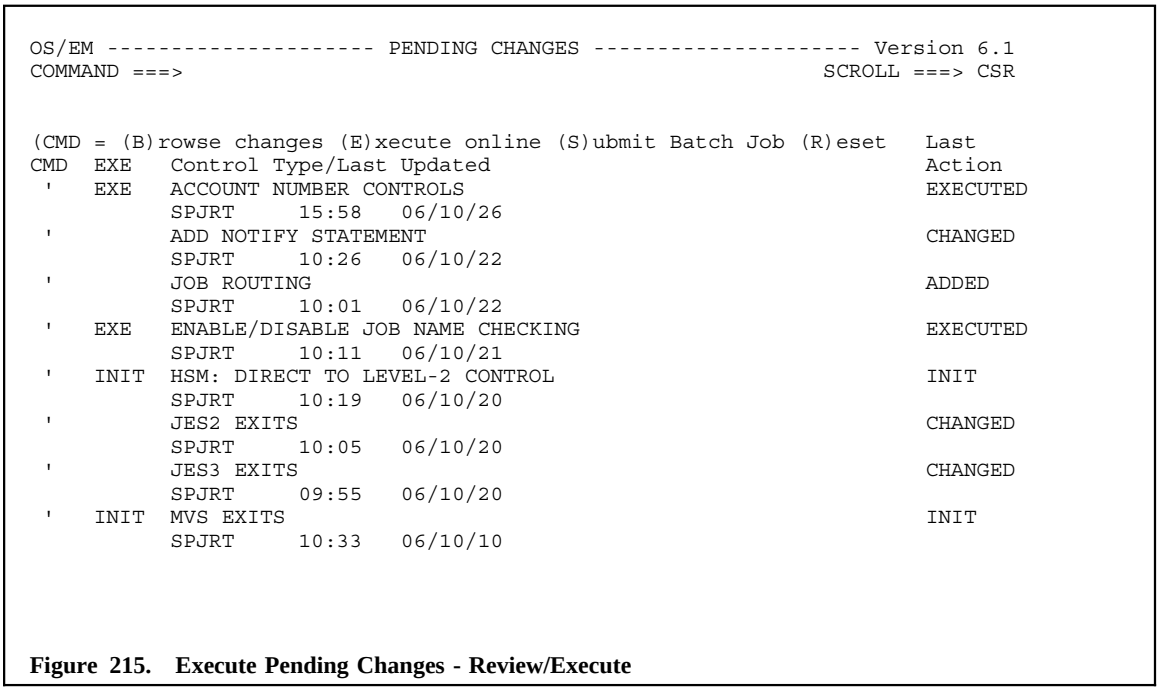

Figure 215. Execute Pending Changes - Review/Execute

The changes are displayed in chronological order (most recent change first).

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The display columns are as follows:

1. CMD

   This is the line command input field. The valid line commands are:

   B Displays all the change details for the selected function (see "Pending Change Detail Display" on page 9-4).

   E Selects the change to be executed from the user's TSO session. This line command is only valid when the status of the change is blank (see below). When the change is selected with the **E** command, the status is changed to **ONL** to indicate that the change has been selected for execution.

   Once all desired changes have been selected, pressing **PF3** will invoke the FEMCNTL commands from the user's TSO session to make the changes to the current environment. Pressing **PF12** or entering **CANCEL** in the panel command line will cancel the selections and control is returned to the OS/EM primary menu.

   R Resets the status for this change. This allows the change to be re-executed with the **E** or **S** line commands.

   This line command is only valid when the status is **EXE** (see below). The status field will be changed to blanks.

   S Selects the change to be executed from a batch job. This line command is only valid when the status of the change is blank (see below). When the change is selected with the **S** command, the status is changed to **SUB** to indicate that the change has been selected for execution by submitting batch job.

   Once all desired changes have been selected, pressing **PF3** will present the user with the batch job submission menu (see "Executing Changes Via A Batch Job" on page 9-5). Pressing **PF12** or entering **CANCEL** in the panel command line will cancel the selections and control is returned to the OS/EM primary menu.

2. Execute Status

   The **EXE** field indicates the current status of the change. Valid status values are:

   (blank) The change has not been executed and the initialization member has not been updated to implement the change.

   EXE The change has been executed and the current OS/EM environment is operating with this change. However, the initialization member has not been built and so the change will not be in effect the next time OS/EM is initialized (typically at the next IPL).

   Refer to "Build Initialization Member" on page 10-1 for building the initialization members.

   Important Notes:

   This status is not reset when OS/EM is re-initialized. Therefore, the status may not reflect the true condition of the current OS/EM environment. Users should use the OS/EM Query function to verify the current function settings (see "Query OS/EM Status" on page 6-1).

   When the changes are executed by a batch job (with the **S** line command), the EXE status indicates that a job was submitted or saved to a file. Users must verify that the job was successfully run to ensure that the changes were actually executed.

   INIT The initialization member has been updated to incorporate this change.

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Refer to “Build Initialization Member” on page 10-1 for building the initialization members.

Note : If the initialization member was built before executing the change, the change will not be invoked until OS/EM is re-initialized (typically at the next IPL). Displaying the details of the change with the **B** line command will show if/when the change was executed. Also, the OS/EM Query function (see “Query OS/EM Status” on page 6-1) can be used to display the current OS/EM environment.

ONL The change has been selected for execution via the user's TSO session. This change will be executed when the **PF3** key is pressed.

SUB The change has been selected for execution by submitting a batch job. When the **PF3** key is pressed, the user will be presented with the batch job submission panel (see “Executing Changes Via A Batch Job” on page 9-5).

3. Control Type

   This is the name of the function that has been changed.

4. Last Updated

   This is the TSO ID, date and time of the most recent change to this function.

5. Last Action

   This is the most recent action that was performed for this function.

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Pending Change Detail Display

The following panel is displayed when the Browse function (line command **B**) is entered in the Pending Changes summary panel.

```
OS/EM --------------------- PENDING CHANGES --------------------- Version 6.1
COMMAND ===>                                                 SCROLL ===> CSR

ENABLE/DISABLE JOB CLASS CHECKING

     User     Time    Date         Field/Data
EXECUTED                          BATCH
     SPJRT    10:33   06/10/27     SPJRT00

CHANGED                           JOB CLASS CHECKING FOR SUBMIT
     SPJRT    10:05   06/10/27     N

INIT
     SPJRT    14:46   06/10/08

***************************** Bottom of data ********************************
```

Figure 216. Pending Changes - Detail

The detail records are presented in chronological order (most recent action first). Each detail record displays:

- The action that was performed.
- The TSO user and the date & time of the action.
- The name of the field that was changed and the value that was assigned to that field.

  For the INIT action, these fields will be blank.

  For the EXECUTE action, the field value will be ONLINE or BATCH. When the field is BATCH, the value will be either the job name or the saved dataset name.

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Executing Changes Via A Batch Job

The following panel is displayed when the Submit function (line command **S**) is entered in the Pending Changes selection panel.

```
OS/EM ------------- EXECUTE PENDING CHANGES IN BATCH ------------ Version 6.1
COMMAND ===>

  Select node name below where your changes should be executed, or
  select ALL nodes ===> NO   (Yes/No)

(S)ubmit   To enter node name, simply type it in with an optional description.

S Submit  SYSAFF or XEQ Node    Description
'  ___      EXPR     _________   Primary Production LPAR ________________
'  ___      _____    N2_______   Development LPAR_____________________
'  ___      _____    BLUE____    SYSPROG LPAR_________________________
'  ___      _____    _________   ____________________________________
'  ___      _____    _________   ____________________________________
'  ___      _____    _________   ____________________________________
'  ___      _____    _________   ____________________________________
'  ___      _____    _________   ____________________________________
'  ___      _____    _________   ____________________________________
'  ___      _____    _________   ____________________________________
```

Figure 217. Execute Pending Changes In Batch

This is a scrollable entry panel which defines up to 32 systems where the batch update job(s) can be routed for execution.

This allows the selected change(s) to be executed on multiple systems for a single batch request.

The fields on this panel are:

- Select ALL nodes (Yes/No)

  Yes - the change execution job will be submitted to all systems defined in the scrollable list.

  No - the change execution job will only be submitted to systems that are specifically selected in the scrollable list.

- S

  This line command field is used to select the system(s) where the execute changes job is to be run. Placing a non-blank character in this field selects the entry for submission.

- Submit

  When the entry is selected as a system to run the execute changes job, this field is set to **YES**. The field is blank when the entry is not selected.

- SYSAFF

  This defines the SYSAFF= (System Affinity) value to be used to identify the system. When this field has a value specified, a job will be generated with a JOBPARM JECL statement with the following format:

```
/*JOBPARM SYSAFF=sysaff
```

If the OS/EM Job Routing function is active, users should be careful to ensure that any active Resource Routing options (e.g. changing SYSAFF to ANY) do not direct the job to an unintended system.

- XEQ Node

  This defines the XEQ node name to be used to identify the system. When this field has a value specified, a job will be generated with a /*ROUTE JECL statement with the following format:

  ```
  /*ROUTE XEQ node
  ```

  When OS/EM Job Routing is active, the XEQ node name may be a Job Routing resource name.

  Note : The SYSAFF and XEQ Node fields are mutually exclusive.

- Description

  This is an optional description field to document the defined system.

System definitions can be added or changed by overtyping the fields in an entry.

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Once the desired system(s) have been selected, pressing **PF3** will present the user with the Job Statement skeleton panel (see below). Pressing **PF12** or entering **CANCEL** in the panel command line will cancel the job submission and return the user to the OS/EM primary menu.

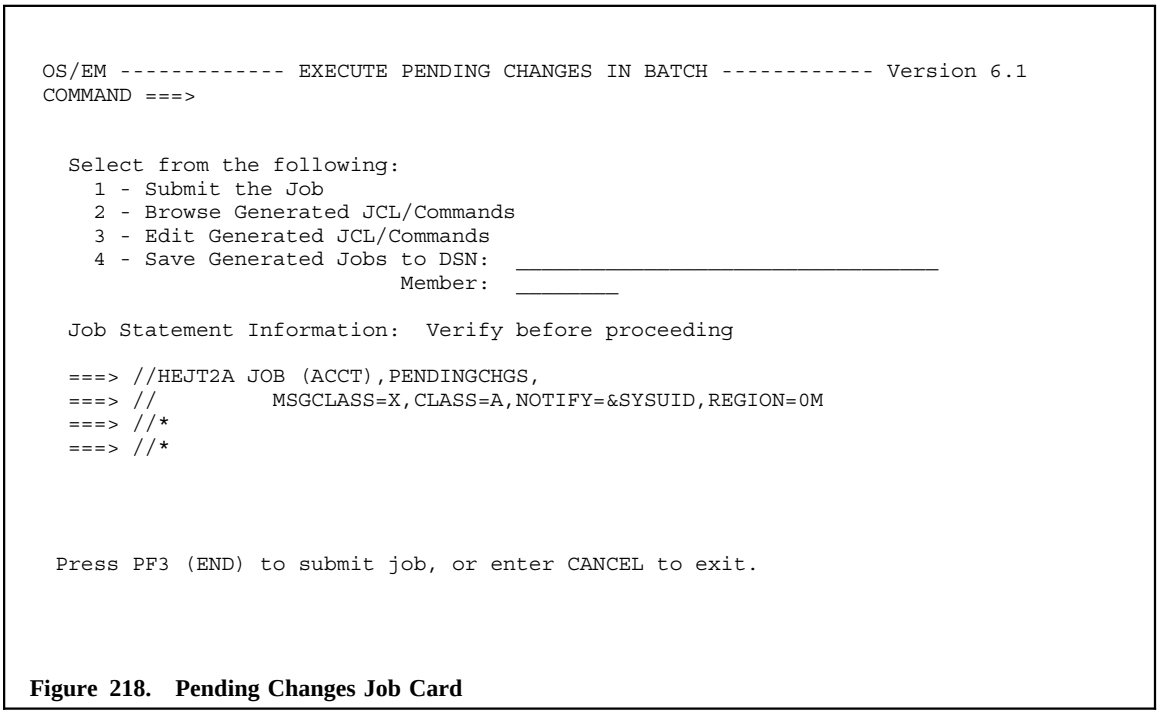

Figure 218. Pending Changes Job Card

Review the job statement skeleton to ensure that the parameters conform to site standards (e.g. account number, CLASS, etc).

Select the desired job submission function:

1. Submit the job
2. Browse the job to be submitted
3. Edit the job to be submitted
4. Save the job to the named dataset. The TSO user name will be inserted as the dataset name prefix if it is not enclosed in quotes. The member field is only valid if the dataset is a PDS or PDS/E. Any existing data in the dataset / member will be overwritten.

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Execute Changes Warning Panel

Whenever changes are executed (TSO or batch) the following warning panel is displayed:

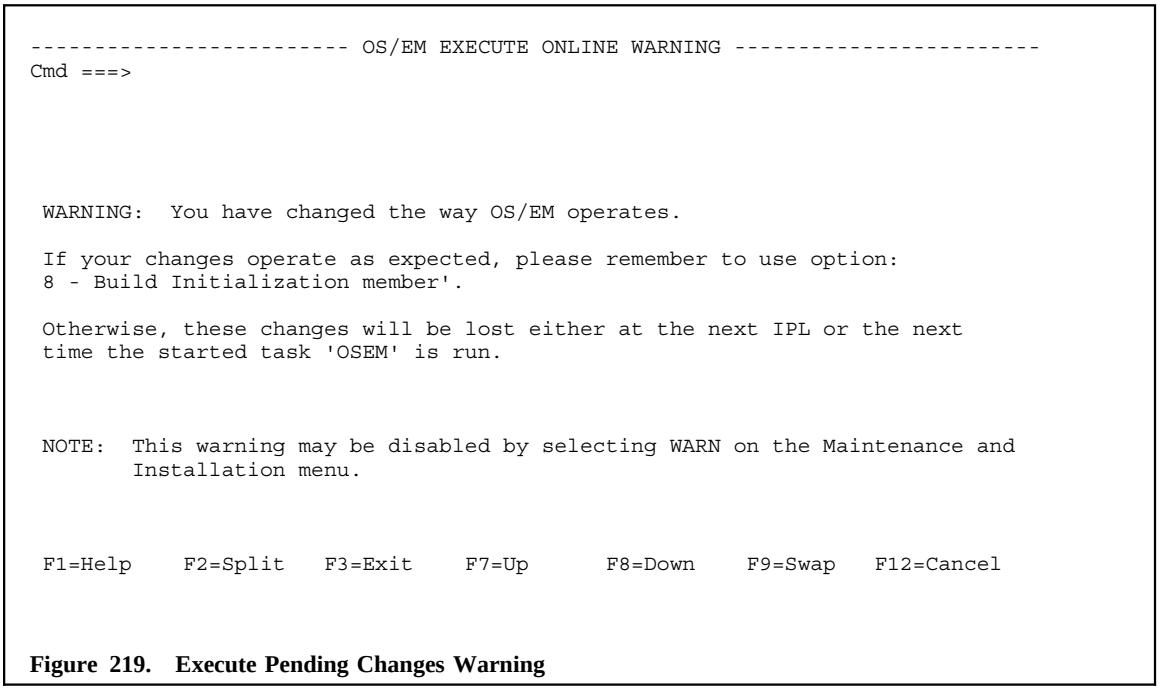

Figure 219. Execute Pending Changes Warning

The purpose of this panel is to remind the user that changes that were just executed should be regarded as temporary and, in order to make them permanent, the Initialization Member(s) must be built. See “Build Initialization Member” on page 10-1 for instructions on performing this process.

If desired, the displaying of this panel can be suppressed. See “Execute Online Warning Message” on page 3-7 for instructions on setting the warning panel display options.

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Build Initialization Member

This facility builds the OS/EM PARMLIB initialization member(s) for the selected function(s). As the name suggests, these members are used during OS/EM initialization. Building the PARMLIB effectively makes changes permanent and all defined controls will be activated every time OS/EM is initialized.

```
OS/EM --------------- BUILD INITIALIZATION MEMBERS -------------- Version 6.1
COMMAND ===>

  Select the Initialization member(s) to build from the following list:

                            SYSTEM WIDE CONTROLS
                       _  1.x - System Level Controls

                            BASIC EXIT FUNCTIONS
                       _  2.1 - JES2 Exits
                       _  2.2 - JES3 Exits
                       _  2.3 - MVS Exits

                            EXTENDED FUNCTIONS
 _ 3.1  - Define Dataset name groups   _ 3.10.1 - DASD Allocation Controls
 _ 3.2  - Define Volume groups         _ 3.10.2 - Quickpool Rules
 _ 3.3  - HSM Optimizer                _ 3.11   - RACF Controls
 _ 3.5  - ISPF File Prefix Controls    _ 3.12   - Restrict Devices
 _ 3.6  - JCL Controls                 _ 3.13   - SVC Delete/Replace
 _ 3.7  - Job Controls                 _ 3.14   - Tape Share Controls
 _ 3.8  - Job Routing/Classing         _ 3.15   - Time Controls
 _ 3.9  - Miscellaneous Controls

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 220. Build Initialization Members

Usage Notes:

- To select a function to be built, place any non-blank character in the input field adjacent to the named function.
- The number preceding the function description is the ISPF dialog fast-path entry for the control panels for that function.
- The change status of each function is indicated by the color of the function field. The colors are:

  Blue No changes have been made to this function.

  Red The function has been changed and the change has been implemented dynamically (see “Execute Pending Changes” on page 9-1).

  Important - When changes are implemented dynamically and the initialization member(s) are **not** built, the changes will not be implemented the next time OS/EM is

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initialized (typically the next IPL). If OS/EM is re-initialized before building the member(s), this status is equivalent to a **yellow** indicator.

Yellow The function has been changed but the PARMLIB member has not been built. Also, the change has not been dynamically invoked (see “Execute Pending Changes” on page 9-1).

These colors may differ if the ISPF environment and/or terminal emulation software has been significantly tailored.

Important Note :

Building the initialization member will **not** invoke the change in the current environment (i.e. the changes will only be made the next time that OS/EM is initialized).

When functions are selected, the progress of the build process is displayed. Figure 221 is an example of this status display.

```
OS/EM ----------------- INITIALIZATION MEMBER BUILD ----------- Version 6.1
COMMAND ===>


   PLEASE WAIT. . . . . .

   The initialization member you requested:

   TIME CONTROLS

   is being generated.

   Depending on the options you have chosen, this process may take some
   time.

   Now processing: WAIT TIME CLASSES
```

Figure 221. Build Initialization Members - Status

The name of the OS/EM PARMLIB dataset is defined during OS/EM installation. This dataset must be available to the OSEM started task, which is executed at system initialization time.

Member names are indicative of the function. For example, HSMINIT is the initialization member for DFHSMShsm support.

Usage Notes :

- A request to build the System Level Controls functions will be rejected if there are no product authorization codes defined. This will be indicated by a error message in a display box on the selection panel. Refer to the Authorization Controls section in “System Level Controls” on page 3-2 for information regarding the definition and maintenance of OS/EM product authorization codes.

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Dynamic Task Library Utility

The OS/EM Dynamic Task Library Utility **FEMLIB** allows a TSO user to define, modify and delete DDNAME definitions for the user's TSO session. The DDNAME can be an existing definition (e.g. STEPLIB, SYSPROC) or a new DDNAME.

Note: Any dataset(s) specified in the FEMLIB command must be a partitioned dataset (PDS or PDSE).

FEMLIB Commands

ALLOCATE

Use the ALLOCATE command to define a new DDNAME or replace an existing DDNAME.

```
FEMLIB ALLocate                                                    -
       FILe(ddname) | DDName(ddname)                               -
       DAtaset(dsn1 {dsn2 dsn3 ...}) | FROmdd(frddn)               -
      {VOLume(volser1 | * {volser2 | *  volser3 | * ...})}         -
      {REOpen | NOReopen}                                          -
      {NOList}                                                     -
      {REUse}                                                      -
      {ABEnd}
```

ADD

Use the ADD command to add one or more datasets to an existing DDNAME.

```
FEMLIB ADD                                                         -
       FILe(ddname) | DDName(ddname)                               -
       DAtaset(dsn1 {dsn2 dsn3 ...})                               -
      {VOLume(volser1 | * {volser2 | *  volser3 | * ...})}         -
      {LASt | FIRst | BEFore(dsn) | AFTer(dsn) | POS(n)}           -
      {REOpen | NOReopen}                                          -
      {NOList}                                                     -
      {ABEnd}
```

DELETE

Use the DELETE command to remove one or more datasets from an existing DDNAME.

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```
FEMLIB DELete                                                          -
       FILe(ddname) | DDName(ddname)                                   -
       DAtaset(dsn1 {dsn2 dsn3 ...})                                   -
      {VOLume(volser1 | * {volser2 | *  volser3 | * ...})}             -
      {REOpen | NOReopen}                                              -
      {NOList}                                                         -
      {ABEnd}
```

UNALLOC

Use the UNALLOC command to delete an existing DDNAME.

```
FEMLIB UNALLOC                                                         -
       FILe(ddname) | DDName(ddname)                                   -
      {ABEnd}
```

LIST

Use the LIST command to display the datasets that are associated with a DDNAME.

```
FEMLIB LISt                                                            -
       FILe(ddname) | DDName(ddname)                                   -
      {STACK{( n | n:m )}}                                 -
      {ABEnd}
```

PUSH

Use the PUSH command to save the DDNAME in the push stack.

```
FEMLIB PUSh                                                            -
       FILe(ddname) | DDName(ddname)                                   -
      {ABEnd}
```

POP

Use the POP command to restore the DDNAME that is on the top of the push stack. Any datasets defined to the DDNAME will be replaced with the contents of the stack.

```
FEMLIB POP                                                             -
       FILe(ddname) | DDName(ddname)                                   -
      {NOList}                                                         -
      {ABEnd}
```


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FEMLIB Operands

DDName
FILe This specifies the DDNAME that the FEMLIB command acts upon. FILE and DDNAME serve the same function and a mutually exclusive. This is a required operand. The DDNAME 'SCRNLIB' may be used to define a task library specific for the ISPF screen where the command is issued. There can be SCRNLIBs as there ISPF screens.

DAtaset This specifies the dataset name(s) to be processed. The dataset naming conventions are according to standard TSO rules (i.e. if the TSO profile has the PREFIX parameter set, the dataset name is prefixed with the TSO prefix for names not in quotes). This is a required operand.

VOLume This operand is required when specifying dataset names that are not catalogued. The volume names are positional and map to the sequence of dataset names specified in the DATASET operand. Only one volume serial number is allowed per dataset. An asterisk can be specified for catalogued datasets (trailing asterisks are not required).

FROmdd This operand specifies an existing allocation which is to be copied to the new allocation. This operand is mutually exclusive to the DATASET parameter.

LASt
FIRst
BEFore
AFTer
POS This operand specifies the location within an existing DDNAME's concatenation where the dataset(s) are to be added. These operands are mutually exclusive.
The parameter for the POS operand is a sequence number where the dataset(s) will be located within the concatenation once the addition is complete. POS(1) is functionally equivalent to FIRST. Any value greater than the number of existing datasets in the concatenation is functionally equivalent to LAST.
If none of these parameters is specified, LAST is assumed.

REOpen
NOReopen This operand controls whether datasets that are currently open should be closed and reopened during command processing. If REOPEN is not specified and datasets are open, the command will fail. REOPEN will only work for datasets that are currently open for input.
REOPEN is assumed for the following DDNAMES - STEPLIB, SYSPROC, SYSHELP, SYSEXEC, IPCSPARM, ISPxLIB.

STAck This operand specifies that the DDNAME information is to be obtained from the stack. The parameter allows you to specify an individual stack entry (n) or a range of entries (n:m). A value of 1 indicates the top entry in the stack. If the value is omitted, a value of 1 is assumed.

REUse This operand will allow any existing allocations for the DDNAME to be discarded and replaced with the new dataset allocation. If REUSE is not specified and the DDNAME exists, the ALLOCATE will fail.

ABEnd This operand will cause an ABEND and a dump if the command return code is 8 or greater.

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FEMLIB Examples

Allocation Example

```
FEMLIB ALLOC DDNAME(STEPLIB) -
             DA(TEST.LOAD TEMP.LOAD 'SYS2.PROD.LOAD') -
             VOL(* TST001) -
             REUSE NOLIST
```

This command will replace the current STEPLIB with the three load libraries specified above. Note that the first two dataset names will be prefixed with the TSO PREFIX profile value (if set). In the example, the dataset prefix.TEMP.LOAD is not catalogued and is located on the volume TST001. A listing of the newly allocated STEPLIB will not be displayed.

Add Example

```
FEMLIB ADD   DDNAME(SYSPROC) -
             DA('SYS2.DEVL.CLIST') -
             POS(3) REOPEN
```

This command will add the named library to the current SYSPROC. Upon successful completion of the command, the added library will be the third dataset in the concatenation. The other libraries in the concatenation will be reopened during processing of this command (this is superfluous in this example since REOPEN is assumed for SYSPROC).

Delete Example

```
FEMLIB DELE  DDNAME(STEPLIB) -
             DA(TEMP.LOAD) -
             VOL(TST001)
```

This command will delete the named load library from the current STEPLIB. The remaining libraries will be reopened during the processing of the command (REOPEN is assumed for STEPLIB).

Deallocation Example

```
FEMLIB UNALLOC DDNAME(STEPLIB)
```

This command will deallocate the current STEPLIB.

List Example

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```
FEMLIB LIST  DDNAME(STEPLIB)
```

This command will display the current STEPLIB allocation.

```
FEMLIB LIST  DDNAME(STEPLIB) STACK(1:3)
```

This command will display STEPLIB allocations that have been stored in the stack. In this case it will display the top three pushed definitions.

Push & Pop Example

```
FEMLIB PUSH  DDNAME(STEPLIB)
```

This command will save the current STEPLIB definition on the push stack. The STEPLIB definition remains active.

```
FEMLIB POP   DDNAME(STEPLIB)
```

This command will replace the current STEPLIB definition with the definition that is stored in the push stack. If there are multiple stack entries, the most recently PUSHed entry will be restored.

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Appendix A. Supported Exits

The following is a list of SMF, TSO, ISPF, JES2, JES3, RACF, Allocation and DFP exits that OS/EM currently supports. The standard support manages the loading and execution of up to three user exits, and optionally an OS/EM exit that provides the Extended support. The listed usage may not cover all the conditions the exit can handle; it is only suggestive of the common use.

Allocation Exits

IEFALLOD	Allocated/Offline Device Exit
IEFALLSW	Specific Waits Exit
IEFALLVE	Volume Enqueue Exit
IEFALLVM	Volume Mount Exit
IEFDB401	Allocation Input Validation Exit (SVC99)

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Data Facility Product (DFP) Exits

IGGPRE00	DADSM Pre-processing for Allocate, Extend, Scratch, Partial Release and Rename
IGGPOST0	DADSM Post-processing for Allocate, Extend, Scratch, Partial Release and Rename

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Data Facility Hierarchical Storage Manager (DFHSM) Exits

ARCADEXT	Data Set Deletion Exit
ARCBDEXT	Data Set Backup Exit
ARCBEEXT	ABARS Backup Error Exit
ARCCBEXT	Control Data Set Backup Exit
ARCCDEXT	Data Set Reblock Exit
ARCCREXT	ABARS Conflict Resolution Exit
ARCEDEXT	ABARS Expiration Date Exit
ARCINEXT	Initialization Exit
ARCMDEXT	Data Set Migration Exit
ARCMMEXT	Second-Level Migration Data Set Exit
ARCMVEXT	Space Management Volume Exit
ARCM2EXT	ABARS Migration Level 2 Data Set Exit
ARCRDEXT	Recall Exit (Not valid for SMS Managed Data Sets)
ARCRPEXT	Recall/Recover Priority Exit
ARCSAEXT	Space Management and Backup Exit
ARCSDEXT	Shutdown Exit
ARCSKEXT	ABARS Data Set Skip Exit
ARCTDEXT	Tape Data Set Exit
ARCTEEXT	Tape Ejected Exit
ARCTVEXT	Tape Volume Exit

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ISPF Exits

Exit 1	ISPF initialization
Exit 2	ISPF termination
Exit 3	SELECT service start
Exit 4	SELECT service end
Exit 5	TSO command start
Exit 6	TSO command end
Exit 7	LIBDEF service
Exit 8	RESERVE
Exit 9	RELEASE
Exit 10	Logical screen start
Exit 11	Logical screen end
Exit 12	ISPF/PDF service start
Exit 13	ISPF/PDF service end
Exit 14	SWAP logical screens
Exit 15	DISPLAY service start
Exit 16	Log, list, and temporary data set allocation

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Job Entry System Two (JES2) Exits

IBM supported Exit points 0-49

Exit 0	Pre-initialization
Exit 1	Print/Punch Separators
Exit 2	Job Statement Scan
Exit 3	Job Statement Accounting Field Scan
Exit 4	JCL and JES2 Control Statement Scan
Exit 5	JES2 Command Preprocessor
Exit 6	Converter/Interpreter Text Scan
Exit 7	JCT Read/Write (JES2)
Exit 8	Control Block Read/Write (User)
Exit 9	Job Output Overflow
Exit 10	$WTO Screen
Exit 11	Spool Partitioning Allocation ($TRACK)
Exit 12	Spool Partitioning Allocation ($STRAK)
Exit 13	TSO/E Interactive Data Transmission Facility Screening and Notification
Exit 14	Job Queue Work Select - $QGET
Exit 15	Output Data Set/Copy Select
Exit 16	Notify
Exit 17	BSC RJE SIGNON/SIGNOFF
Exit 18	SNA RJE SIGNON/SIGNOFF
Exit 19	Initialization Statement
Exit 20	End of Input
Exit 21	SMF Record
Exit 22	Cancel/Status
Exit 23	FSS Job Separator Page (JSPA) Processing
Exit 24	Post-initialization
Exit 25	JCT Read (FSS)
Exit 26	Termination/Resource Release
Exit 27	PCE Attach/Detach
Exit 28	Subsystem Interface (SSI) Job Termination
Exit 29	Subsystem Interface (SSI) End-of-Memory
Exit 30	Subsystem Interface (SSI) Data Set Open and RESTART
Exit 31	Subsystem Interface (SSI) Allocation
Exit 32	Subsystem Interface (SSI) Job Selection
Exit 33	Subsystem Interface (SSI) Data Set Close
Exit 34	Subsystem Interface (SSI) Data Set Deallocation

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Exit 35	Subsystem Interface (SSI) End-of-Task
Exit 36	Pre-security Authorization Call
Exit 37	Post-security Authorization Call
Exit 38	TSO/E Receive Data Set Disposition
Exit 39	NJE SYSOUT Reception Data Set Disposition
Exit 40	Modifying SYSOUT Characteristics
Exit 41	Modifying Output Grouping Key Selection
Exit 42	Modifying a Notify User Message
Exit 43	Transaction Program Select/Terminate/Change
Exit 44	JES2 Converter Exit (Main Task)
Exit 45	Pre-SJF Exit Request
Exit 46	Transmitting a NJE Data Area
Exit 47	Receiving a NJE Data Area
Exit 48	Subsystem Interface (SSI) SYSOUT Data Set Deallocation
Exit 49	Job Queue Work Select

User Defined Exit points 50-255

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Job Entry System Three (JES3) Exits

IBM supported Exit points

IATUX01	Reserved Name
IATUX02	Reserved Name
IATUX03	Examine of modify Converter/Interpreter Text created from JCL
IATUX04	Examine the Job Information from the JCL
IATUX05	Examine the Step Information from the JCL
IATUX06	Examine DD Statement Information from the JCL
IATUX07	Examine or Substitute Unit, Type and Volume Serial Information
IATUX08	Examine Setup Information
IATUX09	Examine Final Job Status, JST and JVT
IATUX10	Generate a Message
IATUX11	Inhibit Printing of the LOCATE Request or Response
IATUX14	Job Validation/Restart LOCATE Request or Response
IATUX15	Scan an Initialization Statement
IATUX16	Reserved Name
IATUX17	Define Set of Scheduler Elements
IATUX18	Check Input Authority Level for Consoles
IATUX19	Examine or Modify Data Temporary OSE
IATUX20	Examine or Modify Data Written on Job Header Pages
IATUX21	Create and Write Data Set Headers for Output Data Sets
IATUX22	Examine or Alter the Forms Alignment
IATUX23	Examine or Modify Data Written to Trailer Pages
IATUX24	Examine the Net-id and Devices Requested
IATUX25	Examine or Modify Volume Serial Number
IATUX26	Examine MVS Scheduler Control Blocks
IATUX27	Examine or Alter the JDAB, JCT and JMR
IATUX28	Examine the Accounting Information as Provided by the Job Statement
IATUX29	Examine the Accounting Information as Provided JCT, JDAB and JMR
IATUX30	Examine Authority Level for TSO/E Terminal Commands
IATUX31	Examine or Modify Destination or Message Text
IATUX32	Override the DYNALLDSN Initialization Statement
IATUX33	JES3 Control Statement and the JCL EXEC Statement Installation Exit
IATUX34	JCL DD Statement User Exit and the JCL EXEC Statement Installation Exit
IATUX35	Validity Check Network Commands
IATUX36	Collect Accounting Information
IATUX37	Modify the JES3 Networking Data Set Header

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IATUX38	Change the SYSOUT Class for Networking Data Sets
IATUX39	Modify the Data Set Header for a SYSOUT Data Set
IATUX40	Modify Job Header
IATUX41	Determine the Disposition of Job Over JCL Limit
IATUX42	TSO/E Interactive Data Transmission Facility Screening and Notification
IATUX43	Modify Job Header Segments
IATUX44	Examine and Modify the JCL
IATUX45	Examine and Modify the Data Sent to an Output Writer FSS
IATUX46	Select Processors Eligible for Converter/Interpreter Processing
IATUX47	Reserved Name
IATUX48	Override Operator Modification of Output Data Sets
IATUX49	Override Address Selected for Converter/Interpreter Processing
IATUX50	Process User Defined BSIDMOD Codes for Converter/Interpreter
IATUX56	Authorize JES3 Commands Entered Through BDT
IATUX57	Select a Single WTO Routing Code for JES3 MGSROUTE
IATUX58	Modify Security Information Before JES3 Security Processing
IATUX59	Modify Security Information After JES3 Security Processing
IATUX60	Determine Action to take when a TSO/E User is Unable to Receive a Data Set
IATUX61	During MDS Processing, Choose Whether a Job Should be Cancelled or Sent to the Error Queue
IATUX62	Overrides the Decision to Accept a Tape or Disk Mount
IATUX66	Assigns Transmission Priority to a SNA/NJE Data Stream
IATUX67	Determines Action when Remote Data Set is Rejected by RACF
IATUX68	Modify Local NJE Job Trailers
IATUX69	Determine If a Message is to be Sent to the Jes3 Global Address Space
IATUX70	Perform Additional Message Processing
IATUX71	Modify a Tape Request Setup Message
IATUX72	Examine/Modify a Temporary OSE or an OSE Moved to Writer Queue

JES3 Exits IATUX73 - IATUX99

IATUX73 - IATUX99 are provided for future compatibility allowing for the specification of the Linkage Types:

BALR
ARETURN
ARETURN with RC=

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Resource Access Control Facility (RACF)

ICHCCX00	RACF password
ICHCNX00	RACF password
ICHDEX01	RACF password encryption
ICHPWX01	New Password exit
ICHRCX01	RACROUTE REQUEST=AUTH Preprocessing
ICHRCX02	RACROUTE REQUEST=AUTH Postprocessing
ICHRDX01	RACROUTE REQUEST=DEFINE Preprocessing
ICHRDX02	RACROUTE REQUEST=DEFINE Postprocessing
ICHRFX01	RACROUTE REQUEST=FASTAUTH Preprocessing
ICHRFX02	RACROUTE REQUEST=FASTAUTH Postprocessing
ICHRFX03	RACROUTE REQUEST=FASTAUTH Preprocessing
ICHRFX04	RACROUTE REQUEST=FASTAUTH Postprocessing
ICHRIX01	RACROUTE REQUEST=VERIFY Preprocessing
ICHRIX02	RACROUTE REQUEST=VERIFY Postprocessing
ICHRLX01	RACROUTE REQUEST=LIST Pre/Postprocessing
ICHRLX02	RACROUTE REQUEST=LIST Selection
IRRACX01	ACEE Compression/Decompression Exit
IRRACX02	ACEE Compression/Decompression Exit
IRREVX01	RACF Common Command Exit

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System Authorization Facility (SAF) Exits

ICHRTX00	MVS Router
IRRSXT00	SAF Callable Services Router

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System Management Facility (SMF) Exits

IEFACTRT	SMF Job/Step Termination Exit
IEFUJI	Job Initiation Exit
IEFUJP	Job Purge Exit
IEFUJV	Job Validation Exit
IEFUSI	Step Initiation Exit
IEFUSO	SYSOUT Limit Exit
IEFUTL	Time Limit Exit
IEFU29	SMF Dump Exit
IEFU83	SMF Record Exit
IEFU84	SMF Record Exit
IEFU85	SMF Record Exit

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Time Sharing Option Extended (TSO/E) Exits

ICQAMFX1	Application Manager Function Pre-initialization
ICQAMFX2	Application Manager Function Post-termination
ICQAMPX1	Application Manager Panel Pre-display
ICQAMPX2	Application Manager Panel Post-display
IEEVSNX0	OPER SEND subcommand Initialization
IEEVSNX1	OPER SEND subcommand Pre-display
IEEVSNX2	OPER SEND subcommand Pre-save
IEEVSNX3	OPER SEND subcommand Failure
IEEVSNX4	OPER SEND subcommand Termination
IKJADINI	ALTLIB Initialization
IKJADTER	ALTLIB Termination
IKJCNXAC	CONSOLE Activation
IKJCNXCD	CONPROFS Pre-display
IKJCNXCI	CONSPROF Initialization
IKJCNXCT	CONPROFS Termination
IKJCNXDE	CONSOLE Deactivation
IKJCNXPP	CONSOLE Pre-parse
IKJCNX50	CONSOLE 80% Message Capacity
IKJCNX64	CONSOLE 100% Message Capacity
IKJCT43I	EXEC Initialization
IKJCT43T	EXEC Termination
IKJCT44B	Add Installation-written CLIST Built-in Functions
IKJCT44S	Add Installation-written CLIST Statements
IKJEESXA	LISTBC Failure
IKJEESXB	LISTBC Termination
IKJEESX0	SEND Initialization
IKJEESX1	SEND Pre-display
IKJEESX2	SEND Pre-save
IKJEESX3	SEND Failure
IKJEESX4	SEND Termination
IKJEESX5	LISTBC Initialization
IKJEESX6	LISTBC Pre-display
IKJEESX7	LISTBC Pre-list
IKJEESX8	LISTBC Pre-read
IKJEESX9	LISTBC Pre-allocate
IKJEFD21	FREE Initialization
IKJEFD22	FREE Termination

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IKJEFD47	ALLOCATE Command Initialization
IKJEFD49	ALLOCATE Command Termination
IKJEFF10	SUBMIT Command
IKJEFF53	OUTPUT, STATUS and CANCEL Commands
IKJEFLD1	Logon Authorized Pre-prompt
IKJEFLD2	LOGOFF
IKJEFLD3	LOGON post-prompt
IKJEFLN1	Logon Pre-display
IKJEFLN2	Logon Post-display
IKJEFXG1	Tailor PUTGET and GETLINE processing
IKJEFY11	OUTDES Initialization
IKJEFY12	OUTDES Termination
IKJEFY60	PRINTDS Initialization
IKJEFY64	PRINTDS Termination
IKJEGASI	TESTAUTH Subcommand Initialization
IKJEGAST	TESTAUTH Subcommand Termination
IKJEGAUI	TESTAUTH Initialization
IKJEGAUT	TESTAUTH Termination
IKJEGCIE	TEST Subcommand Initialization
IKJEGCTE	TEST Subcommand Termination
IKJEGMIE	TEST Initialization
IKJEGMTE	TEST Termination
IKJPRMX1	PARMLIB Initialization
IKJPRMX2	PARMLIB Termination
INMCZ21R	TRANSMIT/RECEIVE NAMES Data Set Pre-allocation
INMRZ01R	RECEIVE Initialization
INMRZ02R	RECEIVE Termination
INMRZ04R	RECEIVE Notification
INMRZ05R	RECEIVE Acknowledgment Notification
INMRZ06R	RECEIVE Pre-acknowledgment Notification
INMRZ11R	RECEIVE Data Set Pre-processing
INMRZ12R	RECEIVE Data Set Post-processing
INMRZ13R	RECEIVE Data Set Encryption
INMRZ15R	RECEIVE Post-prompt
INMRZ21R	RECEIVE Log Data Set Pre-allocation
INMXZ01R	TRANSMIT Startup
INMXZ02R	TRANSMIT Termination
INMXZ03R	TRANSMIT Encryption
INMXZ21R	TRANSMIT Log Data Set Pre-allocation

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IRXINITX	REXX Pre-environment Initialization
IRXITMV	REXX Post-environment Initialization
IRXITTS	REXX Post-environment Initialization
IRXTERMX	REXX Environment Termination

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Appendix B. General Masking

Masks are created by using qualifiers within a volume serial number, Jobname, Program name, TSO User ID, or Terminal ID.

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

Example Volume Serial Number Masks

Example	Explanation
VOL0%%	Matches any serial number that begins with VOL0 and any two numeric characters: VOL010
&%%%%%	Matches any serial number that begins with any alpha character and five numbers.

Example of Jobname Mask

Example	Explanation
SPJTH-	Matches any Jobname that begins with SPJTH
-SP-	Matches any Jobname that contains the characters SP in any position

Example of Terminal Mask

Example	Explanation
TSOGS%%%	Matches any Terminal ID that begins with TSOGS and three numbers

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Example of Program Name Mask

Example	Explanation
DFHSIP	Matches the program name DFHSIP (CICS).

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Appendix C. Define Dataset Name Groups

Dataset Name Groups are used to establish a list of dataset name masks and/or dataset names. This group name is then used in various OS/EM functions instead of specifying the same dataset names in every function.

Build groups as needed. A dataset name or mask may appear in more than one group since each OS/EM function will use Dataset Name Groups in a different way.

Create, change and delete groups by using this dialog. The panels presented allow maintenance of the list of Dataset Name Groups or masks that constitute a group, and add descriptions to groups for documentation purposes.

Refer to the OS/EM User's Guide for detailed information (see Dataset Name Groups).

Dataset name masks

Dataset name masks are created by using qualifiers within a dataset name. Valid qualifiers are:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The minus sign is used to unconditionally match a single node of the dataset name. Multiples are allowed.
+	The plus sign is used to unconditionally match all characters/nodes of the dataset name beyond where it is entered in the specification. A single plus sign may be specified.

Examples of dataset name masks

Example	Explanation
AA	Specifies single-level dataset AAA
AA?AA	Specifies a single-level dataset name of five characters. The first and last two characters are AA. The third character can be anything: AA5AA,AABAA, etc.
AA+	Specifies any dataset name beginning with the two characters AA: AA55.TEST
AA-	Specifies a single-level dataset name beginning with the characters AA: AA5PROD

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AA.+ Specifies a two or more level dataset name. The first node is AA: AA.PROD.COMP

AA.- Specifies a two level dataset name. The first node is AA: AA.CICS

-.AA Specifies a two level dataset name. The last node is AA: PROD.AA

SYS1.-.HRP1000
Specifies a three-level dataset name. The first node is SYS1

-.-.- Specifies any three-level dataset name. This type of specification will match every three-level dataset name within your installation.

GSAX.-.PRM Specifies a three-level dataset name. The first node is GSAX

SYS?.- Specifies a two-level dataset name. The first node starts with SYS and any other character. The second node can be anything: SYS1.LINKLIB

SYS&.- Specifies a two-level dataset name. The first node starts with SYS and any other alphabetic character. The second node can be anything: SYSX.LINKLIB

SYS%.- Specifies a two-level dataset name. The first node starts with SYS and any other numeric character. The second node can be anything: SYS5.LINKLIB

SYSX.-.EZT??? Specifies a three-level dataset name. The first node is SYSX. The second node can be anything. The third node begins with EZT and any three characters: SYSX.CICS.EZT030

??SYSUT?.+ Specifies a two or more level dataset name. The first node begins with any two characters, followed by SYSUT and any other single character.

AA.+.BB Specifies a three or more level dataset name. The first node is AA and the last node is BB.

AA+AA Specifies a single-level dataset name. The first two characters are AA and the last two characters are AA. The up to four middle characters can be anything. There has to be at least one middle character - AAAA will not match.

SYSX.PROCLIB
A fully qualified dataset name.

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Appendix D. Define Volume Groups

Volume name groups are used to establish a list of DASD volumes. This group name is then used in various OS/EM functions instead of specifying the same volume serial numbers in every function.

Build groups as needed. A volume serial number may appear in more than one group since each OS/EM function will use volume serial numbers in a different way.

Create, change and delete groups by using this dialog. The panels presented allow specification of a subset of all groups to operate on, add descriptions to groups for documentation purposes, and maintain the list of volume serial numbers or masks that constitute a group.

Refer to the OS/EM User's Guide for detail information (see Volume Groups).

Volume/Jobname Masks

Volume/Jobname masks are created by using qualifiers within a volume serial number or Jobname. Valid qualifiers are:

Qualifier	Description
?	The question mark is used to unconditionally match any single character (except periods) where the question mark occurs in the specification. Multiples are allowed.
&	The ampersand is used to unconditionally match any single alpha character where the ampersand occurs in the specification. Multiples are allowed.
%	The percent sign is used to unconditionally match any single numeric character where the percent sign occurs in the specification. Multiples are allowed.
-	The dash is used to unconditionally match any preceding or succeeding character(s). Multiples are allowed.

Example Volume Serial Number Masks

Example
Explanation

VOL0%%
Matches any serial number that begins with VOL0 and any two numeric characters: VOL010

&%%%%%
Matches any serial number that begins with any alpha character and five numbers.

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Example of Jobname Mask

Example
Explanation

SPJTH-
Matches any Jobname that begins with SPJTH

-SP- Matches any Jobname that contains the characters SP in any position

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Appendix E. SMF Record Format

The SMF records written as an audit trail have the following format:

```
SMFRCD255 DSECT ,
SMF255LEN DS   BL2'0'    RECORD LENGTH
SMF255SEG DS   BL2'0'    SEGMENT DESCRIPTOR
SMF255FLG DC   BL1'0'    HEADER FLAG BYTE
SMF255RTY DC   BL1'0'    RECORD TYPE 0
SMF255TME DC   BL4'0'    TOD, USING FORMAT FROM TIME MACRO W/BIN. INTVL
SMF255DTE DC   PL4'0000'      DATE IN PACKED DECIMAL FORM: CCYYDDDF
SMF255SID DC   CL4' '    SYSTEM IDENTIFICATION
SMF255JOB DC   CL8' '    JOB NAME
SMF255SUB DC   X'0'      SUBTYPE
SMF255#SP DC   FL1'0'    LEADING SPACES
SMF255CMD DC   CL256' '  COMMAND TEXT
          ORG  SMF255CMD
SMF255WTO DC   CL256' '  WTO TEXT
          ORG  SMF255CMD
SMF255SSN DC   CL4' '    SUBSYSTEM NAME
SMF255ST3 DS   0CL45     RESOURCE ENTRIES - 1 TO MAX OF 127
SMF255RLN DC   X'0'      RESOURCE LEN  - 0 INDICATES END
SMF255RES DC   CL44' '   RESOURCE NAME - VARIABLE LEN
*
```

Refer to the **SMF Recording** section of the OS/EM User Guide for instructions on activating this option.

See member SMFPRINT in the OS/EM SAMPLIB for a job to print these SMF records.

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Appendix F. JES2 Commands

The following are JES2 commands which control the Job Routing function. Each command is protected by RACF and the resource and command authority needed is listed at the end of the appendix.

$DB Display Backlog

This command displays summary information about jobs in the different JES queues.

Command Syntax:

```
$DB
```

Sample output:

```
$DB
$HASP949 1 AWAITING EXECUTION
$HASP949 A = 1
$HASP949 0 AWAITING SPIN
$HASP949 0 AWAITING OUTPUT
$HASP949 118 AWAITING HARDCOPY
$HASP949 0 AWAITING TRANSMISSION
$HASP952 TOTAL JOBS 113-BATCH  47-STC  3-TSO  0-APPC
```

$DC Display Conflicts

This command displays jobs that are currently unable to run on any system in the MAS complex because they have a routing to a resource that is not defined on any member of the MAS. Note that the criterion here is whether the resource is defined to a member of the MAS, not whether that member is currently active.

Command Syntax:

```
$DC{,LIST | ,ALL}
```

With no operands, the response is a single line giving the number of jobs unable to run and the number of resources that those jobs require.

With the "LIST" parameter, the response is multiple lines giving the number of jobs that need each undefined resource, and the name of those resources.

With the "ALL" operand, the response lists each job that is unable to run as well as listing each resource that that job requires.

Sample output:

```
$DC,ALL
$HASP948 DISPLAY CONFLICT 254
$HASP948 ROBCB3(JOB01268) NEEDS RESOURCE IMSPROD
$HASP948 1 JOBS NEED 1 UNDEFINED RESOURCES
```

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$DJ Display Jobs Waiting For Datasets

The $DJ command displays the datasets that are currently not available for the specified job.

Command Syntax:

```
$DJnnnnn
```

where nnnnn is the JES job number.

Sample output:

```
$DJ01267
$HASP890 JOB(ROB9TST) 272
$HASP890 JOB(ROB9TST)   STATUS=(AWAITING EXECUTION),CLASS=A,
$HASP890                PRIORITY=9,SYSAFF=(ANY),HOLD=(NONE),
$HASP890                DSNENQ=(ROB.OSEMTEST.LOAD-EXC)
```

$DP Display Printers/Punches

The $DP command gives a simple one-line display for each printer or punch defined to JES, showing its status.

Command Syntax:

```
$DP{,PUN}
```

Without the "PUN" operand, each printer is listed. With the "PUN" operand, each punch is listed.

Sample output:

```
$DP
$HASP928 PRT3           INACTIVE F=STD       Q=N         FSS
```

$DRESOURCE
Display Resources

The $DRESOURCE command lists resources defined to the members of the MAS. These are the resources that are referenced by the /*ROUTE JECL statements and by the JOBNAME and PROGRAMNAME routing functions.

Command Syntax:

```
$DRESOURCE{,ALL | ,SID}
```

Note: The command may be abbreviated to $DRE, but no shorter as it would then be interpreted as the standard JES2 $DR command.

With no operands, the command produces a list of those resources attached to the MAS member where it was issued. With the "ALL" operand, it lists resources for all the members of the MAS. With the "SID" operand (the system ID of a specific MAS member), it lists the resources attached to that specific member.

Sample output:

```
$DRE
$HASP947 RESOURCE STATUS 268
$HASP947 SYS1 = FILEAID PRODCICS SAS
```


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$LF List Forms

The $LF command lists the work that exists in the hardcopy queue, grouped by form, prmode, dest, writer, burst and select. For each unique combination of the above, the number of sysout datasets in each class is listed.

The scope of the command may be changed by entering additional selection criteria on the command.

Command Syntax:

```
$LF{,F=xxxxxxxx}              Select by FORM
   {,W=xxxxxxxx}              Select by WRITER
   {,PRMODE=xxxxxxxx}         Select by PRMODE
   {,C=xxxx}                  Select by FCB
   {,T=xxxx}                  Select by UCS
   {,J=Jnnnnn{-nnnnn} |
    ,J=Snnnnn{-nnnnn} |
    ,J=Tnnnnn{-nnnnn}}        Select by JOB/STC/TSU numbers
   {,R=xxxxxxxx{-xxxxxxxx}}   Select by Destination.  Operand is
                              NODE or NODE1-NODE2, RMT or RMT1-RMT2,
                              NODE.RMT or NODE1.RMT1-NODE2.RMT2,
                              NODE.USERID or USERID
   {,Q=x...}                  Select by SYSOUT classes
   {,LIM=nnn{-nnn}}           Select by LINE number range
   {,PLIM=nnn{-nnn}}          Select by PAGE number range
   {,D=A |,D=H}               Select ALL or HELD
   {,B=Y |,B=N}               Select by BURST=YES or BURST=NO
   {,S=Y |,S=N}               Select by SELECTABLE or NOT SELECTABLE
   {,JOBS}                    Request that DISPLAY be broken down by
                              individual JOBS
```

Sample output:

```
$LF
$HASP921 F=STD R=LOCAL PRMODE=LINE S=N 286
$HASP921 Q: K=3 X=115
$HASP921 F=STD R=LOCAL PRMODE=LINE
$HASP921 Q: A=4

$LF,Q=A,JOBS
$HASP921 STC09815 BPXAS    F=STD R=LOCAL PRMODE=LINE 284
$HASP921 Q: A=1
$HASP921 TSU00890 ROB      F=STD R=LOCAL PRMODE=LINE
$HASP921 Q: A=1
$HASP921 TSU01082 ROB      F=STD R=LOCAL PRMODE=LINE
$HASP921 Q: A=1
$HASP921 STC01184 SDSF     F=STD R=LOCAL PRMODE=LINE
$HASP921 Q: A=1
```

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$LN List JOBQUEUE by NAME

This command produces a detailed list of jobs executing and/or awaiting execution. For jobs being held, the reason(s) for the hold are displayed (e.g. required resource, Dependent Job Control (DJC) conditions, DSN conflict).

Command Syntax:

```
$LN{,ALL{,IND} |              Select by SYSAFF ALL
    ,ANY       |              Select by SYSAFF ANY
    ,sysid     |              Select by SYSAFF for sysid
    ,IND}                     Select by independent mode
   {,V=xxxxxx}                Select by SPOOL VOLSER
   {,AFTER=xxxxxxxx{(nnnnn)}  Select by AFTER specification
                               JOBNAME and optional JOB NUMBER
   {,BEFORE=xxxxxxxx{(nnnnn)} Select by BEFORE specification
                               JOBNAME and optional JOB NUMBER
   {,WITH=xxxxxxxx{(nnnnn)}   Select by WITH specification
                               JOBNAME and optional JOB NUMBER
   {,PRED=xxxxxxxx{(nnnnn)}   Select by PRED specification
                               JOBNAME and optional JOB NUMBER
   {,EXCLUDE=xxxxxxx{(nnnnn)} Select by EXCLUDE specification
                               JOBNAME and optional JOB NUMBER
   {,CNTL=xxxxxx}             Select by CNTL resource, resource is
                               1-44 characters, alpha, numeric,
                               national, underscore and period.
                               Period cannot be first or last
                               character
   {,RES=xxxxxx}              Select by ROUTING resource
                               Resource is 1-44 characters, alpha,
                               numeric, national, underscore and
                               period.  Period cannot be first or
                               last character
   {,ROUTE=nnn{-nnn}}         Select by execution routing NODE or
                               NODE.RMT.  No USERIDS.
   {,Q=XEQ |                  Select XEQ queue
    ,Q=CNV |                  Select CONVERT queue
    ,Q=STC |                  Select STCS
    ,Q=TSU |                  Select TSUS
    ,Q=HOLD   |               Select HELD jobs
    ,Q=READY  |               Select READY jobs
    ,Q=ACTIVE |               Select ACTIVE JOBS/STCS/TSUS
    ,Q=DJCOWN |               Select owners of DJC resources
    ,Q=DJCHOLD}               Select JOBS held for DJC
   {,C=x{-x}}                 Select by JOBCLASS range; classes
                               may be A-Z, 0-9, * (CNV), $ (STC),
                               or @ (TSU).
```

Usage Notes:

- At least one optional parameter must be specified.
- The $LN command will normally display only jobs that are waiting for execution. However, some optional parameters (e.g. Q=ACTIVE) will display executing jobs.

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Sample output:

```
$LN,ALL
$HASP890 JOB(ROB9TST) 290
$HASP890 JOB(ROB9TST)   STATUS=(AWAITING EXECUTION),CLASS=A,
$HASP890                PRIORITY=9,SYSAFF=(ANY),HOLD=(NONE),
$HASP890                DSNENQ=(ROB.OSEMTEST.LOAD-EXC)
$HASP890 JOB(ROBCB3) 291
$HASP890 JOB(ROBCB3)    STATUS=(AWAITING EXECUTION),CLASS=A,
$HASP890                PRIORITY=9,SYSAFF=(ANY),HOLD=(NONE),
$HASP890                DJC(RESOURCE),RESOURCE=(IMSPROD)
$HASP646  42 PERCENT SPOOL UTILIZATION

$LN,ALL,RES=IMSPROD
$HASP890 JOB(ROBCB3) 296
$HASP890 JOB(ROBCB3)    STATUS=(AWAITING EXECUTION),CLASS=A,
$HASP890                PRIORITY=9,SYSAFF=(ANY),HOLD=(NONE),
$HASP890                DJC(RESOURCE),RESOURCE=(IMSPROD)
$HASP646  42 PERCENT SPOOL UTILIZATION
```

$LQ List JOBQUEUE

This command produces a summary list of jobs executing and/or awaiting execution. For a detailed display, use the $LN command.

The Command Syntax is the same as the $LN command except that there is no requirement to specify any optional parameter ($LQ is equivalent to $LQ,Q=XEQ).

Sample output:

```
$LQ
$HASP945     2 XEQ A ALL 740
$HASP646  42 PERCENT SPOOL UTILIZATION

$LQ,Q=STC
$HASP945    43 XEQ $ ALL 744
$HASP646  42 PERCENT SPOOL UTILIZATION

$LQ,Q=READY
$HASP945     1 READY  A ALL 746
$HASP646  42 PERCENT SPOOL UTILIZATION
```

$QA Resource ADD command.

$QD Resource DELETE command.

These two commands allow you to ADD and DELETE resources from a MAS member.

Command Syntax:

```
$QA | $QD                    $QA = ADD, $QD = DELETE
 ,xxxx                       Resource name (1-44 bytes)
 {,SID}                      SID where add/delete is to take place.
                              The default is the system where the
                              command is entered.
 {,FORCE}  (DELETE only)     Delete the resource even if the
                              resource is currently in use by an
                              active job on the targeted system.
```

$Q'xxx', $QJ

These commands add and delete **DEPENDENT JOB CONTROL (DJC)** conditions, routing resources and CNTL specifications for jobs already in the job queue.

Command Syntax:

```
$Q'xxxxxxxx'                  Specify JOBNAME
$QJnnnnn{-nnnnn}              Specify JOB number(s)
 {,HSMRETRY}                  Retry failed HRECALLs
 {,RELEASE(HSM)}              Do not hold job for HRECALLs
 {,HOLD(HSM)}                 Hold job for HRECALLs
 {,RELEASE(USERLIMIT)}        Do not hold job for user limits
 {,HOLD(USERLIMIT)}           Hold job for user limits
 {,RELEASE(PGMLIMIT)}         Do not hold job for program limits
 {,HOLD(PGMLIMIT)}            Hold job for program limits
 {,JOBROUTE=xxxxxx,NODE=nnnn} Route specified job(s) to
                              node if JOBROUTE resource
                              is assigned to the job
 {,RELEASE(DJC)}              Do not hold job for dependent job controls
 {,NOAFTER}                   Remove AFTER conditions
 {,NOPRED}                    Remove PRED conditions
 {,NOBEFORE}                  Remove BEFORE conditions
 {,NOWITH}                    Remove WITH conditions
 {,NOEXCLUDE}                 Remove EXCLUDE conditions
 {,NOCNTL}                    Remove all CNTL resources
 {,NOROUTE}                   Remove all ROUTING resources
 {,ADDRES=xxxx}               Add ROUTING resource.  OBSOLETE.
                               Use ROUTE instead.
 {,DELRES=xxxx}               Remove ROUTING resource. OBSOLETE.
                               Use ROUTE instead.
 {,ROUTE=({+|-}xxxx,....)}    Add or remove ROUTING resource.
                               + (ADD) and - (DEL) are optional
                               and default to ADD.
                               Enclosing parens are optional if
                               only 1 resource is specified.
 {,CNTL=({+|-}xxxx{-SHR | -EXC},...)}
                              Add or remove CNTL resource.
                               + (ADD) and - (DEL) are optional
                               and defaults to ADD.  -SHR and
                               -EXC are optional and default to
                               -SHR.  Not meaningful for delete.
                               Enclosing parens are optional if
                               only 1 resource is specified.
 {,AFTER=({+|-}xxxxx{(nnnn|WAIT|MULT)},...)}
```


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```
                                Add or Remove AFTER resource.
                                + (ADD) & - (DEL) are optional and
                                default to ADD.  JOBNUM, WAIT and
                                MULT are optional.  WAIT and MULT
                                are not valid for DELETE.
                                The enclosing parentheses are
                                optional if only one job is
                                specified.
{,BEFORE=({+|-}xxxx{(nnnn|OK|MULT)},...)}
                                Add or remove BEFORE resource.
                                + (ADD) & - (DEL) are optional and
                                default to ADD.  JOBNUM, OK and
                                MULT are optional.  MULT and OK are
                                not valid for DELETE.
                                The enclosing parentheses are
                                optional if only one job is
                                specified.
{,EXCLUDE=({+|-}xxxx(nnnn|OK|MULT){,SYSTEM|TIME}},...)}
                                Add or remove EXCLUDE resource.
                                + (ADD) & - (DEL) are optional and
                                default to ADD.  JOBNUM, MULT, OK,
                                SYSTEM & TIME are optional.  MULT,
                                OK, SYSTEM & TIME are not valid
                                for DELETE.
                                The enclosing parentheses are
                                optional if only one job is
                                specified.
{,PRED=({+|-}xxxx{(nnnn|WAIT|MULT)},...)}
                                Add or remove PRED resource.
                                + (ADD) & - (DEL) are optional and
                                default to ADD.  JOBNUM, WAIT and
                                MULT are optional.  WAIT and MULT
                                are not valid for DELETE.
                                The enclosing parentheses are
                                optional if only one job is
                                specified.
{,WITH=({+|-}xxxx{(nnnn|WAIT|MULT){,SYSTEM|TIME}},...)}
                                Add or remove WITH resource.
                                + (ADD) & - (DEL) are optional and
                                defaults to ADD.  JOBNUM, WAIT, MULT,
                                SYSTEM & TIME are optional.  WAIT,
                                MULT, SYSTEM & TIME are not valid
                                for DELETE.
                                The enclosing parentheses are
                                optional if only one job is
                                is specified.
```

RACF Resources and Authority Table

Command	Resource Name	Authority
$DB	jesx.DISPLAY.OSEM	READ
$DC	jesx.DISPLAY.OSEM	READ
$DP	jesx.DISPLAY.OSEM	READ
$DRESOURCE	jesx.DISPLAY.OSEM	READ
$LF	jesx.DISPLAY.OSEM	READ
$LN	jesx.DISPLAY.OSEM	READ
$LQ	jesx.DISPLAY.OSEM	READ
$QA	jesx.ADD.OSEM	CONTROL
$QD	jesx.DELETE.OSEM	CONTROL
$Q'xxxx'	jesx.MODIFY.OSEM	UPDATE
$QJ	jesx.MODIFY.OSEM	UPDATE

Replace **jesx** with the name of your JES2 subsystem.

Note: All listed resources are defined to the **OPERCMDS** class.

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Appendix G. JECL Statements for Job Routing

The appendix documents the JECL statements that are supported by OS/EM to control the execution of jobs within the MAS.

Resource Routing Control JECL Statements

These cards provide a facility by which jobs can be routed to specific CPUs depending on the availability of a particular resource name assigned to a CPU. Resource names are user defined and specified with the $QA command. Once defined, these resource names attached to a CPU remain in effect until they are detached via the $QD command.

Resources specified can define physical I/O units which may be attached to only one CPU at a time, or possibly a software name which may only pertain to one particular CPU.

A job may contain up to 127 /*ROUTE XEQ statements.

The format of the resource routing JECL statement is:

```
/*ROUTE XEQ resourcename
```

The JECL statement must follow the JOB statement.

Following are some examples of using the ROUTE XEQ control statement:

```
System #      Resources Attached
   1            DUALD, IMS
   2            3525
   3            IMS,TSO,NOINQ

//BSPROUT JOB (,,,7552,429),'TEST RESOURCE',CLASS=A
/*ROUTE XEQ IMS
//S1 EXEC PGM=IEFBR14
```

This job will be scheduled to either system #1 or system #3 because of the IMS resource requested.

The $DC command is used to display those jobs which have used the /*ROUTE XEQ resource JECL statement and no CPUs have that resource name attached. For example, using the above list, if a job were submitted with a '/*ROUTE XEQ SCANNER' statement, the job would never execute no matter how many initiators were available until a $QA,SCANNER command was issued on a system in the complex. This would be detectable by issuing a $DC command which would display those jobs waiting for resource names.

Other /*ROUTE control cards formats are:

```
/*ROUTE XEQ HERE
```

The resource name 'HERE' is a reserved resource name that forces the job to be run on the system where the job is read in (there is no requirement to define the HERE resource with the $QA command).

Note: Do not have an initiator add the SYSAFF=* parameter to a job as this overrides OS/EM Job Routing.

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/*CNTL and /*THREAD JECL Statements

The **CNTL** and **THREAD** statements are processed identically.

This JECL statement allows the user to serialize the execution of jobs where critical resources (e.g. a device or a dataset that is to be updated) is required exclusively. The advantage of this facility over GRS (Global Resource Serialization) is that conflicting jobs will not be selected for execution, thus freeing initiators to run other work.

The resource name specified in the /*CNTL statement is an arbitrary name. If any other jobs come into the system with the same resource name defined, they will not execute simultaneously on the same or other CPUs in the MAS. This provides better control over the resources that must be used serially. This does not affect jobs running without the /*CNTL card or running in a system outside the MAS.

The format of the JECL statement is:

```
/*CNTL resourcename{,EXC | SHR}

/*THREAD resourcename{,EXC | SHR}
```

Jobs with the same resource name will not execute simultaneously if one of the jobs has an EXC control specification. Jobs with SHR may execute simultaneously on any member in the MAS. Alternately, a job requesting EXC control will not execute while other jobs have EXC or SHR control over the resource.

The EXC / SHR control parameter is optional. The default control value is defined in the Job Routing JECL Defaults control panel (see “JECL Defaults” on page 5-182)

Users may also protect datasets from being updated by different jobs on the same or different CPUs by using the /*CNTL card. Each /*CNTL statement may have a 1 to 44 character control name and, optionally, an EXC or SHR specification.

Up to 127 CNTL and/or THREAD statements may be specified per job.

The following are /*CNTL and /*THREAD usage examples:

```
//JOB1 JOB
/*CNTL MASTER,EXC

//JOB2 JOB
/*THREAD MASTER,SHR
```

In the above example, whichever job began execution first, would lockout the other job from beginning until it has completed.

```
//JOB1 JOB
/*CNTL MASTER,SHR
/*CNTL PINOT_NOIR,SHR
/*THREAD SYS1.LINKLIB,SHR
/*CNTL DUALDENS,SHR
/*CNTL CABERNET,SHR

//JOB2 JOB
/*CNTL MASTER
/*CNTL DUALDENS

//JOB3 JOB
/*THREAD MASTER,SHR
/*THREAD PINOT_NOIR
```

In the above example, all 3 jobs could run simultaneously as they all specify the SHR option.

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AFTER, BEFORE, EXCLUDE, PRED and WITH JECL Statements

These JECL statements are commonly referred to as Dependant Job Control (DJC) statements and are used to control the execution sequence of jobs. A job can contain up to 127 DCJ statements.

Default DJC parameters are set in the Job Routing JECL Defaults control panel (see "JECL Defaults" on page 5-182).

AFTER & PRED JECL Statement

The AFTER and PRED JECL statements are functionally equivalent. The AFTER / PRED statement allows the job to execute on any eligible MAS member only **after** the specified job has completed execution.

```
                                <no_job> <mult_job>

/*AFTER   jobname{(jobnum)}{,IGNORE}{,IGNORE}
                           {,FAIL  }{,FAIL  }
                           {,WAIT  }{,OK    }
                           {,      }

/*PRED    jobname{(jobnum)}{,IGNORE}{,IGNORE}
                           {,FAIL  }{,FAIL  }
                           {,WAIT  }{,OK    }
                           {,      }
```

jobname This is the only required parameter. This parameter defines the name of the job that must complete execution before this job will be selected.

jobnum This optional parameter defines the job number associated with the specified job name. This allows the JECL statement to reference a specific job.

No Job Present This parameter defines the action to take when there is no job in the input queue that matches the job name specification.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately.

FAIL - The job will be canceled with a JCL error.

WAIT - The job will wait until the named job is read in and completes execution. This option is not valid if a job number is specified.

Multiple Jobs Present This parameter defines the action to take when there is more than one job present in the input queue that matches the job name specification. This parameter has no meaning if the job specification includes a job number.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately.

FAIL - The job will be canceled with a JCL error.

OK - The job will not be selected until all jobs with the specified name have completed execution. Any jobs with the specified name that may be read in prior to this job beginning execution will also take selection precedence.

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BEFORE JECL Statement

The BEFORE statement will only allow the job to execute on any eligible MAS member if the specified job has **not** been selected for execution. Jobs with the specified job name will not be selected for execution until this job has completed. If a job with the specified job name is already executing when the job is read in, the job be canceled with a JCL error.

```
                                <no_job> <mult_job>

/*BEFORE  jobname{(jobnum)}{,IGNORE}{,IGNORE}
                           {,FAIL  }{,FAIL  }
                           {,OK    }{,OK    }
                           {,      }
```

jobname This is the only required parameter. This parameter defines the name of the job(s) that will wait until this job completes execution.

jobnum This optional parameter defines the job number associated with the specified job name. This allows the JECL statement to reference a specific job.

No Job Present This parameter defines the action to take when there is no job in the input queue that matches the job name specification.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately. If a job is read in with the specified job name, it will be eligible for immediate execution.

FAIL - The job will be canceled with a JCL error.

OK - The job will be selected for execution. If a job is read in with the specified job name while this job is executing, it will not be selected until this job completes. This option is not valid if a job number is specified in the JECL statement.

Multiple Jobs Present This parameter defines the action to take when there is more than one job present in the input queue that matches the job name specification. This parameter has no meaning if the job specification includes a job number.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately. If subsequent jobs are read in with the specified job name, they will also be eligible for immediate execution.

FAIL - The job will be canceled with a JCL error.

OK - The job will only be selected for execution if the jobs in the input queue with the specified name are not executing. If any of the jobs are executing, this job will be canceled with a JCL error. If this job can execute, all jobs with the specified job name (including jobs read in after this job starts executing), will not be selected for execution until this job completes.

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EXCLUDE JECL Statement

The EXCLUDE statement will only allow the job to execute if the specified job is **not** executing. The scope of this control can be MAS-wide (i.e. the TIME option means that this job will not execute if the specified job is executing on any member of the MAS) or system specific (i.e. the SYSTEM option will only prevent the execution of this job on any MAS member that is executing the specified job).

Once this job is selected for execution, jobs with the specified name will not be eligible for execution until this job has completed (the scope of the exclusion, TIME / SYSTEM, still applies).

```
                                <no_job> <mult_job>

/*EXCLUDE jobname{(jobnum)}{,IGNORE}{,IGNORE}{,TIME}
                              {,FAIL  }{,FAIL  }{,SYSTEM}
                              {,OK    }{,OK    }
                              {,      }
```

jobname This is the only required parameter. This parameter defines the name of the job(s) that this job must execute exclusively from.

jobnum This optional parameter defines the job number associated with the specified job name. This allows the JECL statement to reference a specific job.

No Job Present This parameter defines the action to take when there is no job in the input queue that matches the job name specification.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately. If a job is read in with the specified job name, it will be eligible for immediate execution.

FAIL - The job will be canceled with a JCL error.

OK - The job will be selected for execution. If a job is read in with the specified job name while this job is executing, it will not be selected until this job completes. The scope of this is determined by the TIME / SYSTEM option. This option is not valid if a job number is specified in the JECL statement.

Multiple Jobs Present This parameter defines the action to take when there is more than one job present in the input queue that matches the job name specification. This parameter has no meaning if the job specification includes a job number.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately. If subsequent jobs are read in with the specified job name, they will also be eligible for immediate execution.

FAIL - The job will be canceled with a JCL error.

OK - The job will only be selected for execution if the jobs in the input queue with the specified name are not executing. If any of the jobs are executing, this job will not be selected for execution until the job(s) has/have completed (the scope of this exclusion is determined by the TIME / SYSTEM option). If this job can execute, all jobs with the specified job name (including jobs read in after this job starts executing), will not be selected for execution until this job completes.

TIME | SYSTEM This control parameter determines the scope of the exclusion. **TIME** will make the jobs run exclusively across all members of the MAS. **SYSTEM** will allow the jobs to run concurrently only when they can execute on separate members of the MAS.

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WITH JECL Statement

The WITH statement will only allow the job to execute if the specified job is executing. The scope of this control can be MAS-wide (i.e. the TIME option means that this job will execute on any eligible member of the MAS, provided the specified job is executing) or system specific (i.e. the SYSTEM option will only allow the execution of this job on the MAS member that is executing the specified job).

```
                                <no_job> <mult_job>

/*WITH    jobname{(jobnum)}{,IGNORE}{,IGNORE}{,TIME}
                           {,FAIL  }{,FAIL  }{,SYSTEM}
                           {,WAIT  }{,OK    }
                           {,      }
```

jobname This is the only required parameter. This parameter defines the name of the job(s) that this job must execute concurrently with. The TIME / SYSTEM control parameter determines whether the job will run on any eligible MAS member (TIME) or on the same MAS member as the specified job (SYSTEM).

jobnum This optional parameter defines the job number associated with the specified job name. This allows the JECL statement to reference a specific job.

No Job Present This parameter defines the action to take when there is no job in the input queue that matches the job name specification.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately.

FAIL - The job will be canceled with a JCL error.

WAIT - The job will wait for the specified job to begin execution before it will be allowed to execute. This option is not valid if a job number is specified in the JECL statement.

Multiple Jobs Present This parameter defines the action to take when there is more than one job present in the input queue that matches the job name specification. This parameter has no meaning if the job specification includes a job number.

IGNORE - The JECL statement is to be treated as a comment. The job will be executed immediately.

FAIL - The job will be canceled with a JCL error.

OK - The job will only be selected for execution when any of the jobs in the input queue with the specified name is executing.

TIME | SYSTEM This control parameter determines the scope of the WITH control statement. **TIME** will allow the job to execute on any eligible member of the MAS. **SYSTEM** will force the job to run on the same MAS member as the specified job.

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The following is an example of the use of these control cards:

```
/*PRIORITY     13
//BSPTEST JOB (,,7552,429),RUSBASAN,MSGLEVEL=(1,1),CLASS=A
/*ROUTE XEQ MSS
/*AFTER BSPFIRST,WAIT
//S1 EXEC PGM=IEFBR14
/*
/*PRIORITY     2
//BSPFIRST JOB (,,7552,429),RUSBASAN,MSGLEVEL=(1,1),CLASS=A
/*ROUTE XEQ CPU2
/*CNTL DUAL,EXC
//SA EXEC PGM=IEFBR14
/*
```

In the above example, job BSPTEST would not execute until job BSPFIRST has finished execution, even though BSPTEST has a higher priority.

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Appendix H. $HASP Messages for Job Routing ($HASP6xx & $HASP9xx)

The following messages may be issued by the OS/EM Job Routing option:

$HASP606 INSUFFICIENT OPERANDS

Produced by the $LN command.

$HASP608 OS/EM STATUS UNKNOWN

$HASP610 JOB(S) NOT FOUND

$HASP619 NO OUTPUT QUEUED

Produced by the $LF command.

$HASP624 'CMD' 'JOBNAME' MULTIPLE JOBS FOUND

Produced by a $Qx command.

$HASP646 nn PERCENT SPOOL UTILIZATION

Produced by the $LN command.

$HASP668 NO DEVICE(S) FOUND

Produced by the $DP command.

$HASP687 UNABLE TO OBTAIN SECURITY PRODUCT MESSAGES

$HASP690 COMMAND REJECTED - AUTHORIZATION FAILURE

$HASP900 TOO {MANY | FEW} OPERANDS

$HASP901 INVALID OPERAND xxxxx

$HASP902 TOO MANY RESOURCES ALREADY DEFINED

$HASP903 UNABLE TO ACCESS RESOURCE DATASET

$HASP904 jjjj(nnn) JOB {HELD | CANCELLED}

$HASP905 RESOURCE IN USE. YOU MUST USE FORCE TO DELETE

Produced by the $QD command.

$HASP906 jjjj(nnn) BAD JCTX DATA - RC = retcode

$HASP907 JOBNAME xxxx IS NOT SUITABLE FOR DJC

Produced by a $Qx command.

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$HASP908 NO MATCH FOUND FOR SPECIFIED RESOURCE

Produced by the $QJ command.

$HASP921 free-format message

Produced by the $LF command.

$HASP922 free-format message

Produced by the $LQ command.

$HASP928 free-format message

Produced by the $DP command.

$HASP929 jjjj(nnn) /*djc statement REMOVED

Produced by the $QJ / $Q'xxx' command.

$HASP930 jjjj(nnn) EXECUTION IMPOSSIBLE /*djc statement ALREADY {HELD | FLUSHED | COMPLETED | EXECUTING}

$HASP931 * -- JOBROUTE FAILED - ALREADY 127 ROUTES IN USE

$HASP932 jjjj(nnn) * -- EXCLUDE JOBNAME = xxxx -- {SYSTEM | TIME}

$HASP933 jjjj(nnn) SYNTAX ON /*PRED IS INVALID

$HASP934 jjjj(nnn) SYNTAX ON /*EXCLUDE IS INVALID

$HASP935 jjjj(nnn) SYNTAX ON /*BEFORE IS INVALID

$HASP936 jjjj(nnn) SYNTAX ON /*AFTER IS INVALID

$HASP937 jjjj(nnn) PARM SPECIFIED ON /*CNTL STATEMENT IS INVALID

$HASP938 jjjj(nnn) TOO MANY {DJC | CNTL/THREAD | ROUTE} STATEMENTS

$HASP939 jjjj(nnn) SYNTAX ON /*WITH IS INVALID

$HASP940 jjjj(nnn) * -- AFTER JOBNAME = xxxx --

$HASP941 jjjj(nnn) * -- WITH JOBNAME = xxxx -- {SYSTEM | TIME}

$HASP942 jjjj(nnn) * -- RESOURCE ROUTING = xxxxx --

$HASP943 jjjj(nnn) * -- CONTROL INFO = xxxxx -- {SHR | EXC}

$HASP944 jjjj(nnn) * -- BEFORE JOBNAME = xxxx --

$HASP945 jjjj(nnn) * -- PRED JOBNAME = xxxx --

$HASP946 sid - NO RESOURCES ATTACHED

Produced by the $DRESOURCE command.

$HASP947 sid - resname resname resname ....

Produced by the $DRESOURCE command.

$HASP948 NO RESOURCE CONFLICTS

Produced by the $DC command.

$HASP949 nnn AWAITING {EXECUTION | SPIN | OUTPUT | HARDCOPY | TRANSMISSION}

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Produced by the $DB command.

$HASP950 jjjj(JOBnnnnn) * -- JOBROUTE rulenum ruletype = value --

Produced when OS/EM generates an automatic route or a change to jobclass/priority, scheduling environment, service class or xeq node. Where:

rulenum is the OS/EM Resource Routing and Classing rule number.

ruletype is the OS/EM Resource Routing and Classing resource being set.

value is the value being assigned.

$HASP951 OS/EM VER n.n - JOBROUTING ACTIVE ON subsys FOR sid

$HASP952 TOTAL JOBS nnn-BATCH nnn-STC nnn-TSO nnn-APPC

Produced by the $DB command.

$HASP953 nnn JOBS NEED RESOURCE resname

Produced by the $DC command.

$HASP954 nnn JOBS NEED nnn UNDEFINED RESOURCES

Produced by the $DC command.

$HASP955 jjjj(nnn) NEEDS RESOURCE resname

Produced by the $DC command.

$HASP956 jjjj(nnn) /*djc JOB xxxxxxxx IS NOT SUITABLE

Produced by the $QJ / $Q'xxx' command.

djc is AFTER, WITH, BEFORE, EXCLUDE OR PRED

$HASP957 FOR DJC - djc

Produced by the $QJ / $Q'xxx' command.

djc is AFTER, WITH, BEFORE, EXCLUDE OR PRED

$HASP958 jjjj(nnn) ONLY nnn {RESOURCE | DJC | CNTL/THREAD} STATEMENTS ALLOWED

$HASP959 jjjj(nnn) UNABLE TO ADD {ROUTE | CNTL | THREAD | djc} - JCTX IS FULL

djc is AFTER, WITH, BEFORE, EXCLUDE OR PRED

$HASP960 jjjj(nnn) NEEDS RESOURCES ASSIGNED TO MULTIPLE SYSTEMS

$HASP961 nnn JOBS NEED RESOURCES ASSIGNED TO MULTIPLE SYSTEMS

Produced by the $DC command.

$HASP962 jjjj(nnn) DJC {ADDED | DELETED}: AFTER JOBNAME = xxxxx

Produced by the $QJ / $Q'xxx' command.

$HASP963 jjjj(nnn) DJC {ADDED | DELETED}: BEFORE JOBNAME = xxxxx

Produced by the $QJ / $Q'xxx' command.

$HASP964 jjjj(nnn) DJC {ADDED | DELETED}: EXCLUDE JOBNAME = xxxxx

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Produced by the $QJ / $Q'xxx' command.

$HASP965 jjjj(nnn) DJC {ADDED | DELETED}: PRED JOBNAME = xxxxx

Produced by the $QJ / $Q'xxx' command.

$HASP966 jjjj(nnn) DJC {ADDED | DELETED}: WITH JOBNAME = xxxxx

Produced by the $QJ / $Q'xxx' command.

$HASP967 jjjj(nnn) RESOURCE ROUTING {ADDED | DELETED}: xxxxx

Produced by the $QJ / $Q'xxx' command.

$HASP968 jjjj(nnn) CONTROL INFO {ADDED | DELETED}: xxxxx-{SHR | EXC}

Produced by the $QJ / $Q'xxx' command.

$HASP969 jjjj(nnn) EXEMPTED FROM {DSNENQ | HSM | PGMLIMIT | USERLIMIT} PROCESSING

Produced by the $QJ / $Q'xxx' command.

$HASP970 jjjj(nnn) INCLUDED IN {DSNENQ | HSM | PGMLIMIT | USERLIMIT} PROCESSING

Produced by the $QJ / $Q'xxx' command.

$HASP971 OS/EM VER v.r - JCL CONVERTED BY jes ON sid

$HASP972 JOB jjjj(nnn) CANCELLED DUE TO OS/EM ERROR - reason

$HASP973 INVALID $OSEM DATA | MTTR FOUND IN JOB jjjj(nnn), CODE xxx

When this message is issued, an SVC dump is obtained and the job is canceled. Normal processing continues. Contact OS/EM customer support to arrange for the dump to be sent for analysis.

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Appendix I. MVS Commands for Tape Share

The following operator commands are available to control TAPESHR functions.

In the following command formats, **dev_spec** refers to the syntax allowed for ordinary MVS vary commands, e.g. 580 or 580-581 or (580,582-588), etc.

- V dev_spec,ONTPSHR

  To vary a device onto TAPESHR control, that is to have TAPESHR assume control of varying the device online and offline as needed to fulfill the needs of the various systems.

- V dev_spec,OFFTPSHR

  To cause TAPESHR to relinquish control of a device.

- V dev_spec,OFFLINE,LOCAL

  To indicate to TAPESHR that a device is not to be used, that is brought online, on this system only. The device is still eligible for use on other systems.

- V dev_spec,ONLINE,LOCAL

  To indicate to TAPESHR that a device which was previously varied offline locally may once again be used on this system. This command must be issued on the same system as the VARY OFFLINE,LOCAL command.

- V dev_spec,OFFLINE,GLOBAL

  To indicate to TAPESHR that a device is not to be used by any system in the complex. This command may be issued on any system.

- V dev_spec,ONLINE,GLOBAL

  To indicate to TAPESHR that a device that was previously varied offline globally may now be used again. This command may be issued on any system.

- D TAPESHR

  Displays all devices defined to tapeshr and their current status (see Display Units command below for a list of status codes).

A **modify** command is available to shut down **FEMTPSHR**.

```
F FEMTPSHR,STOP {option}
```

Where {option} is:

- WAIT

  This causes TAPESHR to wait until all owned tape devices have gone offline and so may safely be used by other systems where TAPESHR is still active.

- REMOVE

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The devices which do not go offline within 15 seconds will be removed from TAPESHR control and it will become the operator's responsibility to coordinate the use of those devices on the various systems. Note that if any uncontrolled device is eligible for use when a job goes into allocation recovery, TAPESHR will not participate in device selection other than to remove all TAPESHR devices from the candidate list, thus forcing the job to use an uncontrolled device.

- GLOBALOFFLINE (Default)

  The devices which do not go offline within 15 seconds will be marked as globally offline to protect them from being allocated by another TAPESHR system. After the devices go offline on the system where TAPESHR is being terminated, the operator may issue a command to vary them back online globally to make them available to the other systems where TAPESHR is still active.

You may optionally use the **STOP** command (**P**).

```
P FEMTPSHR
```

The STOP command uses the GLOBALOFFLINE option.

The Display Units command has been enhanced to show the TAPESHR status of those devices controlled by TAPESHR. The additional data includes the system currently owning the device (or the word 'NONE'). There may also be additional characters appended to show additional information. These include:

- -A

  Indicates the device is allocated.

- -LO

  Indicates local offline.

  The -LO status can be removed by issuing a vary online,local command.

- -LO(P)

  Indicates the device is pending local offline.

- -GO

  Indicates global offline.

  The -GO status can be removed by issuing a vary online,global command.

- -GO(P)

  Indicates pending global offline.

- -EO

  Indicates error offline. Error offline indicates that an attempt was made to vary the device online and the system was unable to bring the device online for some (usually hardware) reason. This status can be cleared by re-issuing the vary online command once the problem has been resolved.

- -RST

  Indicates restricted device.

- -PND

  Indicates pending status.

- -D

  Indicates device being deleted.

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Appendix J. OS/EM External Security Profiles Summary

This is a summary of the external security profiles that OS/EM will use when the optional security functions are enabled.

Job Class Checking

JOBCLASS.x

All JOBCLASS profiles are defined to the FACILITY class (IBMFAC for CA-TopSecret).

Operating System and JES2 Command Checking

COMMAND.*	Generic profile for all operating system commands
COMMAND.cmd	'cmd' must be full command verb (e.g. MOUNT)
JES2.*	Generic profile for all JES2 commands
JES2.$cmd	'cmd' is the single-character command (excluding ADD, DEL, TRACE & VS)

All command profiles are defined to the FACILITY class (IBMFAC for CA-TopSecret).

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OS/EM JES2 Command Checking

The following table lists the OS/EM JES2 commands and the associated security resource and access authority required.

Command	Resource Name	Authority
$DB	jesx.DISPLAY.OSEM	READ
$DC	jesx.DISPLAY.OSEM	READ
$DP	jesx.DISPLAY.OSEM	READ
$DRESOURCE	jesx.DISPLAY.OSEM	READ
$LF	jesx.DISPLAY.OSEM	READ
$LN	jesx.DISPLAY.OSEM	READ
$LQ	jesx.DISPLAY.OSEM	READ
$QA	jesx.ADD.OSEM	CONTROL
$QD	jesx.DELETE.OSEM	CONTROL
$Q'	jesx.MODIFY.OSEM	UPDATE
$QJ	jesx.MODIFY.OSEM	UPDATE

jesx is the JES2 subsystem name.

All command profiles are defined to the OPERCMDS class.

JCL & SYSOUT Parameter Checking

Users can optionally define the security class and profile names to be checked when controlling the use of JCL & SYSOUT parameters. Refer to the JCL Controls section of the OS/EM User's Guide for more information regarding this option.

If the class and profile names are not defined, the following FACILITY class (IBMFAC for CA-TopSecret) profiles will be used:

JCL.parm.value

where valid 'parm' values are:

ACCTx (x = 1 through 6)
ADDRSPC
DATACLASS
DDNAMES
DPRTY
EXPDT
MGMTCLASS
PERFORM
PROTECT
PRTY
RETPD
STORCLASS
SUBSYS
TIME (valid values are MAXIMUM, 1440, NOLIMIT & HIGH)
UNIT
USERLIB

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BURST
CHARS
COPIES
DEST
FCB
FLASH
FORM
FORMDEF
MODIFY
MSGCLASS
OUTPRTY
PAGEDEF
PRMODE
SYSOUT
UCS
WRITER

FEMCNTL Command Security

External security can be used to secure the FEMCNTL functions. The FEMCNTL utility is used to enable / disable / alter OS/EM functions and user exits.

FEMCNTL.sysid.command

where valid 'command' values are:

*****	Generic profile for all FEMCNTL commands
ACF2	OS/EM ISPF Dialog security for CA-ACF2 users
ALLOC	Device allocation functions and user exits
CODE	OS/EM Authorization Code functions
DASD	DSN and Volume Group functions
DASDCNTL	DASD Quickpool functions and IGGPRE00 & IGGPOST0 user exits
DUMP	OS/EM Dump functions
HSM	HSM Optimizer functions and DFSMShsm user exits
ISPF	ISPF functions and user exits
JES2	JES2 functions and user exits
JES3	JES3 user exits
MISC	Miscellaneous functions
POOL	OS/EM Quickpool functions
QUERY	OS/EM Query function
RACF	RACF functions, OS/EM ISPF Dialog security for RACF users and user exits
RELOAD	OS/EM & user exit load module load / reload functions
SAF	SAF user exits
SMF	SMF functions and user exits
SVC	SVC Delete / Replace functions
SYSTEM	OS/EM general system functions
TOPS	OS/EM ISPF Dialog security for CA-TopSecret users
TSO	TSO functions and user exits

All function profiles are defined to the FACILITY class (IBMFAC for CA-TopSecret).

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ISPF Admin Dialog Security

External security can be used to secure the ISPF Administration dialog functions. The profile names have the structure

OSEM.sysid.ADMIN.function

where sysid is the SMF system name (defined in the SID parameter of the SMFPRMxx PARMLIB member).

The 'function' name is hierarchical in structure to allow flexible security by functional group with generic profiles. For example:

OSEM.sysid.ADMIN.*	Profile for all ISPF administration functions
OSEM.sysid.ADMIN.MAINT.*	Profile for ISPF administration Maintenance functions

Valid 'function' values are:

MAINT.AUTH.CODE	Option 1.1
MAINT.ENABLE.EXPIRE.MSG	Option 1.2
MAINT.NOTIFY.GROUPS	Option 1.3.1
MAINT.NOTIFY.ALLOC	Option 1.3.2
MAINT.NOTIFY.DASD	Option 1.3.3
MAINT.NOTIFY.HSM	Option 1.3.4
MAINT.NOTIFY.ISPF	Option 1.3.5
MAINT.NOTIFY.JES2	Option 1.3.6
MAINT.NOTIFY.JES3	Option 1.3.7
MAINT.NOTIFY.MISC	Option 1.3.8
MAINT.NOTIFY.RACF	Option 1.3.9
MAINT.NOTIFY.SAF	Option 1.3.10
MAINT.NOTIFY.SMF	Option 1.3.11
MAINT.NOTIFY.TSO	Option 1.3.12
MAINT.NOTIFY.OSEM	Option 1.3.13
MAINT.NOTIFY.USER	Option 1.3.14
MAINT.SMF.RECORD.NUMBER	Option 1.4
MAINT.PERF.COUNTS	Option 1.5
MAINT.ENABLE.WARN.MSG	Option 1.6
MAINT.PEND.CHG.CLEANUP	Option 1.7
MAINT.REBUILD.TABLES	Option 1.8
MAINT.OFFSET.LIBS	Option 1.10.1
MAINT.JES2.OFFSET	Option 1.10.2
MAINT.JES3.OFFSET	Option 1.10.3
MAINT.COPY.SMPE2EXEC	Option 1.11
MAINT.INST.VARIABLES	Option 1.12
MAINT.GEN.DSNAMES	Option 1.13
MAINT.CREATE.TABLES	Option 1.15
MAINT.UPGRADE.TABLES	Option 1.16
BASIC.JES2.EXITS	Option 2.1
BASIC.JES3.EXITS	Option 2.2
BASIC.MVS.EXITS	Option 2.3
DEFINE.DSN.GROUPS	Option 3.1
DEFINE.VOL.GROUPS	Option 3.2
HSM.BKUP	Option 3.3.1
HSM.DEFRAG	Option 3.3.2
HSM.DBA	Option 3.3.3
HSM.DBU	Option 3.3.4
HSM.DIRECT.ML2	Option 3.3.5
HSM.EARLY.RECALL	Option 3.3.6
HSM.DSORG	Option 3.3.7

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HSM.MIG	Option 3.3.8
HSM.ML2	Option 3.3.9
HSM.PRTY.REQUESTS.SYS	Option 3.3.10.1
HSM.PRTY.RECALL.REQS	Option 3.3.10.2
HSM.PRTY.RECOVER.REQS	Option 3.3.10.3
HSM.QUICK.DELETE	Option 3.3.11
HSM.REBLOCK	Option 3.3.12
HSM.RECALL.VOL.SELECT	Option 3.3.13
HSM.REPORTS	Option 3.4.1
HSM.SMF.COLLECT	Option 3.4.2
HSM.DEFINE.REPT.FILES	Option 3.4.3
ISPF.PREFIX	Option 3.5
JCL.ACCOUNT.NUMBERS	Option 3.6.1
JCL.EZPROC	Option 3.6.2
JCL.JOB.CLASS.CHECKING	Option 3.6.3.1
JCL.JOB.NAME.CHECKING	Option 3.6.3.2
JCL.FORCE.OPEN	Option 3.6.4
JCL.OTHER.ADDRSPC	Option 3.6.5.1
JCL.OTHER.DATACLASS	Option 3.6.5.2
JCL.OTHER.DDNAMES	Option 3.6.5.3
JCL.OTHER.DPRTY	Option 3.6.5.4
JCL.OTHER.EXPDT	Option 3.6.5.5
JCL.OTHER.MGMTCLASS	Option 3.6.5.6
JCL.OTHER.PERFORM	Option 3.6.5.7
JCL.OTHER.PROTECT	Option 3.6.5.8
JCL.OTHER.PRTY	Option 3.6.5.9
JCL.OTHER.RETPD	Option 3.6.5.10
JCL.OTHER.STORCLASS	Option 3.6.5.11
JCL.OTHER.SUBSYS	Option 3.6.5.12
JCL.OTHER.TIME	Option 3.6.5.13
JCL.OTHER.UNIT	Option 3.6.5.14
JCL.OTHER.USERLIB	Option 3.6.5.15
JCL.STEPLIB.SYSTEM	Option 3.6.6.1
JCL.STEPLIB.SEL.LISTS	Option 3.6.6.2
JCL.SYSOUT.BURST	Option 3.6.7.1
JCL.SYSOUT.CHARS	Option 3.6.7.2
JCL.SYSOUT.COPIES	Option 3.6.7.3
JCL.SYSOUT.DEST	Option 3.6.7.4
JCL.SYSOUT.FCB	Option 3.6.7.5
JCL.SYSOUT.FLASH	Option 3.6.7.6
JCL.SYSOUT.FORM	Option 3.6.7.7
JCL.SYSOUT.FORMDEF	Option 3.6.7.8
JCL.SYSOUT.MODIFY	Option 3.6.7.9
JCL.SYSOUT.MSGCLASS	Option 3.6.7.10
JCL.SYSOUT.OUTPRTY	Option 3.6.7.11
JCL.SYSOUT.PAGEDEF	Option 3.6.7.12
JCL.SYSOUT.PRMODE	Option 3.6.7.13
JCL.SYSOUT.SYSOUT	Option 3.6.7.14
JCL.SYSOUT.UCS	Option 3.6.7.15
JCL.SYSOUT.WRITER	Option 3.6.7.16
JCL.TAPE.CONTROLS	Option 3.6.8
JCL.VIRTUAL.STORAGE	Option 3.6.9
JOB.ADD.NOTIFY	Option 3.7.1
JOB.CONTROL.JES2.CMDS	Option 3.7.2
JOB.CONTROL.MVS.CMDS	Option 3.7.3
JOB.DSN.CONFLICT.RESOL	Option 3.7.4
JOB.JOB.STEP.NOTIFY	Option 3.7.5
JOB.LIMITS.BY.USER	Option 3.7.6.1
JOB.PROGRAM.LIMITS	Option 3.7.6.2

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JOB.JOB.START.MESSAGE	Option 3.7.7
JOB.JOB.STEP.STATISTICS	Option 3.7.8
JOB.NOT.CATALOGED2	Option 3.7.9
JOB.REFORMAT.JOB.ACCT	Option 3.7.10
SET.JES.NAME	Option 3.7.11
JOB.SURROGATE.PASSWORDS	Option 3.7.12
JOB.SYSOUT.EXTEND.JES2	Option 3.7.13.1
JOB.SYSOUT.EXTEND.OUTLM	Option 3.7.13.2
JOB.TSO.LOGOFF.STATS	Option 3.7.14
JOB.VERIFY.USER.RACF	Option 3.7.15
JOB.VERIFY.USER.JOBNAME	Option 3.7.16
JOBROUTE.SYSTEM.LEVEL	Option 3.8.1
JOBROUTE.JECL.DEFAULTS	Option 3.8.2
JOBROUTE.MSG.SUB	Option 3.8.3
JOBROUTE.ROUTING.GROUPS	Option 3.8.4
JOBROUTE.CHANGE.JOBCLS	Option 3.8.5
JOBROUTE.CHANGE.SCHENV	Option 3.8.6
JOBROUTE.CHANGE.SRVCLS	Option 3.8.7
JOBROUTE.CHANGE.XEQNODE	Option 3.8.8
SET.JES.NAME	Option 3.8.9
MISC.ACF2.NONCANCEL	Option 3.9.1
MISC.CATALOG.ACCOUNT	Option 3.9.2
MISC.ESTIMATED.COSTS	Option 3.9.3
MISC.SMF.DUMP	Option 3.9.4.1
MISC.SMF.DUMP.IEFU29L	Option 3.9.4.2
MISC.TSO.PGM.INTERCEPT	Option 3.9.5
MISC.WTO	Option 3.9.6
QUICKPOOL.DASD.ALLOC	Option 3.10.1
QUICKPOOL.RULES	Option 3.10.2
RACF.DISCRETE.PROFILES	Option 3.11.1
RACF.EXTERNAL.TAPE	Option 3.11.2
RACF.RESTRICT.PASSWORD	Option 3.11.3
RESTRICT.DEVICES	Option 3.12
SVC.REPLACE	Option 3.13
TAPESHR.SYSTEM.LEVEL	Option 3.14.1
TAPESHR.DEVICE.LEVEL	Option 3.14.2
TIME.JOB.TIME	Option 3.15.1
TIME.SYSTEM.LEVEL	Option 3.15.2
TIME.SELECTION.LISTS	Option 3.15.3
QUERY.STATUS	Option 4
RELOAD.JES2.USER.MODS	Option 5.1
RELOAD.JES3.USER.MODS	Option 5.2
RELOAD.MVS.USER.MODS	Option 5.3
RELOAD.SYSTEM.MODS	Option 5.4
RELOAD.RACF.TABLES	Option 5.5
SET.JES.NAME	Option 6
XEQ.PENDING.CHANGES	Option 7
BUILD.INIT.MEMBER	Option 8

All administration function profiles are defined to the FACILITY class (IBMFAC for CA-TopSecret).

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Other RACF Resources

Resource Name	*Description*
DISCRETE.PROFILE.class	These resources are used by the RACF Discrete Profiles function to control the definition of discrete profiles. 'class' is the name of the resource class that is being controlled. READ access permits a user to create discrete profiles. See “RACF Discrete Profiles” on page 5-225. This is a FACILITY class resource.
EXTERNAL.TAPE	This resources is used by the External Tape Controls function to allow users to open datasets that have no defined profile. the resource class that is being controlled. READ access permits a user to open external datasets. See “External Tape Control” on page 5-226. This is a FACILITY class resource.

User Defined Resources

The following OS/EM functions use external security resources, the names of which are defined by the user.

OS/EM Function	*Description*
Job Limiting	External security can be used to allow users to bypass the job limiting controls. READ access to the defined resource will permit a user to execute more concurrent jobs than may be allowed by the job limiting rules. This resource is optional. If it is not defined all users' jobs will be subject to the job limiting controls. See “Job Limits By User” on page 5-153. Example - BYPASS.JOB.LIMITS
SYSOUT Extensions	External security can be used to grant SYSOUT extensions when the output limits are exceeded. Read access to the defined resource will grant SYSOUT extensions to the user's job (the size of the extension is defined in the SYSOUT Extension Controls). This resource is optional. If it is not defined all users' jobs will be subject to the SYSOUT extension controls. See “Sysout Extensions” on page 5-169. Example - EXTEND.SYSOUT
Time Extensions	External security can be used to grant CPU and/or wait time extensions when the job / step / wait time limits are exceeded. Read access to the defined resource(s) will grant CPU or wait extensions to the user's job / step. (the size of the extension is defined in the Time Extensions System Level Controls. These resources are optional. If they are not defined all users' jobs will be subject to the Time extension controls. See “Time Extensions System Level Controls” on page 5-243. Example - EXTEND.JOBCPU, EXTEND.STEPCPU, EXTEND.WAIT

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