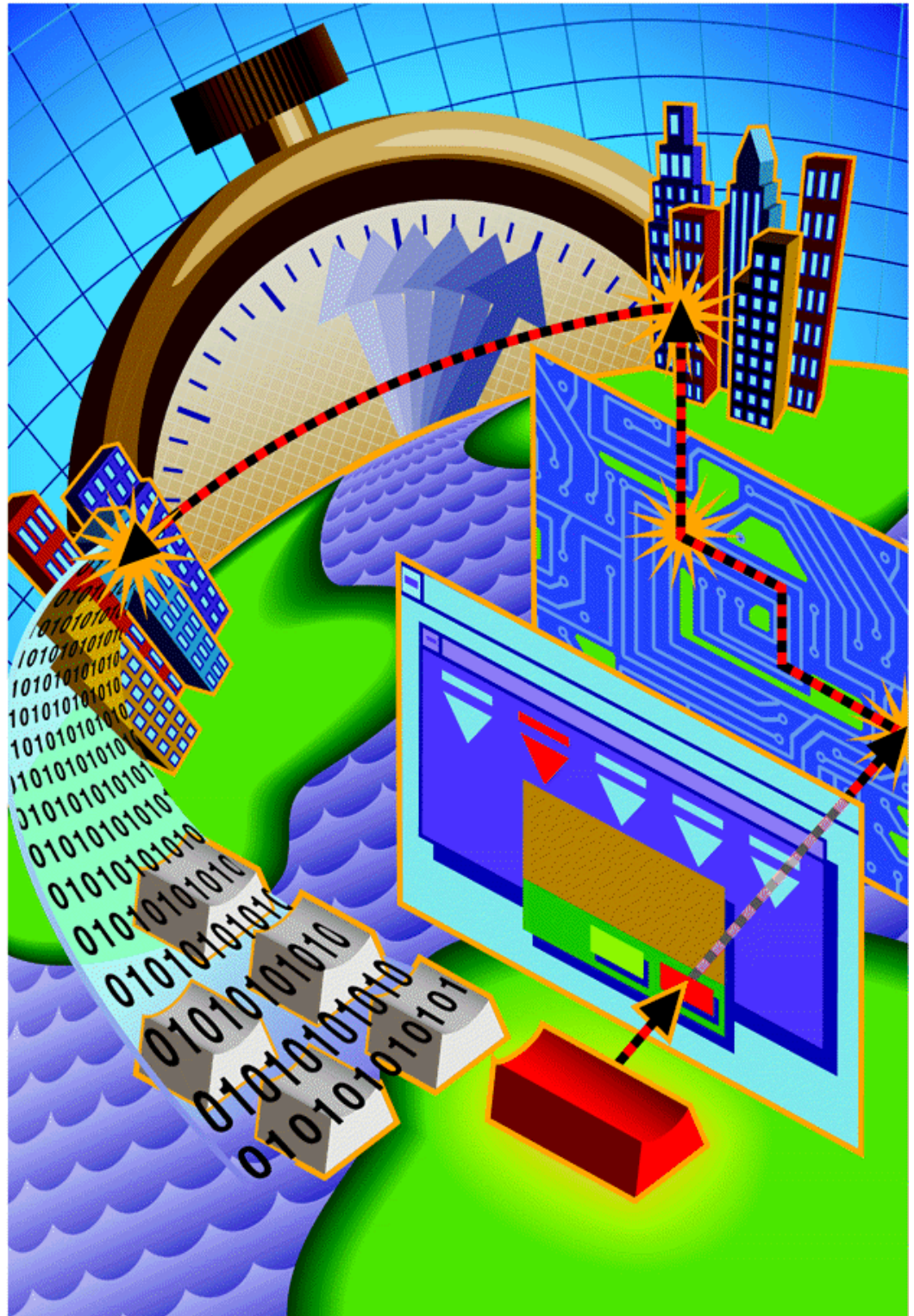


RECOVERY MANAGER for OS/390 User Guide



BMC
SOFTWARE

RECOVERY MANAGER

**for OS/390
User Guide**

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Version 1.2

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**BMC[®]
SOFTWARE**

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About This Manual

This manual provides information needed by the MVS system programmer to use the RECOVERY MANAGER for OS/390 product from BMC Software, Inc. This manual is intended for users who have a working familiarity with MVS (Multiple Virtual Storage), JCL (Job Control Language), and ISPF (Interactive System Productivity Facility). A knowledge of IBM* and BMC Software backup and recovery utilities is desirable.

In this manual, “RECOVERY MANAGER” refers to the RECOVERY MANAGER for OS/390 product. When referring to BMC Software’s other RECOVERY MANAGER products, the entire product name is used; for example, RECOVERY MANAGER for DB2*.

How This Manual Is Organized

Chapter 1, “About RECOVERY MANAGER for OS/390,” provides an overview of the product, including what problems it solves, how it works, and its most important features and functionality.

Chapter 2, “Getting Started with RECOVERY MANAGER,” discusses aspects of the product that a user should be aware of before using it for the first time, including the required authorizations, the defaults supplied, and the user interface.

Chapter 3, “Creating and Working with Groups,” provides instructions for creating, saving, and retrieving application groups. Object and group revalidation as well as associated reporting are also discussed.

Chapter 4, “Working with Utility Options,” describes the backup and recovery options that are available with RECOVERY MANAGER.

Chapter 5, “Backing Up and Recovering Groups,” describes the backup and recovery options that are available with RECOVERY MANAGER and how to generate backup and recovery JCL.

Chapter 6, “Managing System Resources,” provides instructions for generating JCL to back up or recover RECOVERY MANAGER system resources, including the RECOVERY MANAGER repository and RASCAT (Recovery Assets Catalog).

Chapter 7, “Coordinated Recovery Support,” discusses the support provided by RECOVERY MANAGER for coordinated recovery management.

Chapter 8, “Performance Considerations,” discusses ways to use RECOVERY MANAGER for the most efficient performance.

Appendix A, “RECOVERY MANAGER Control File,” provides details of the MVS data set member (MRM\$OPTS) that contains RECOVERY MANAGER control information.

Appendix B, “RECOVERY MANAGER Messages and Codes,” lists the online and batch messages issued by RECOVERY MANAGER together with explanations and recommended user responses.

A glossary and index are included at the end of the manual.

Related Documentation

BMC Software products are supported by several types of documentation:

- online and printed books
- online Help
- release notes and other notices

Note: The messages that RECOVERY MANAGER generates are available in an MVS data set that is downloaded during installation. For each message, the data set includes an explanation and suggests a user response. The MVS data set is called *HLQ.MSGS* (where *HLQ* is the high-level qualifier that is specified during installation).

Online and Printed Books

The books that accompany BMC Software products are available in online format and printed format. If you are a Windows or Unix user, you can view online books with Acrobat Reader from Adobe Systems. The reader is provided at no cost, as explained in “To Access Online Books.” You can also obtain additional printed books from BMC Software, as explained in “To Request Additional Printed Books.”

The documentation set for RECOVERY MANAGER includes the following:

- *Backup and Recovery Products for DB2 and OS/390 Installation Guide*—provides information on how to install RECOVERY MANAGER
- *RECOVERY MANAGER for OS/390 General Information*—describes the features and benefits of RECOVERY MANAGER in more detail

Other publications referenced in this manual include the following:

- BMC Software products:
 - *RECOVERY UTILITY for VSAM User Guide*
 - *EXTENDED BUFFER MANAGER Reference Manual*
 - *COORDINATED RECOVERY MANAGER for MVS User Guide*
 - *RECOVERY MANAGER for DB2* User Guide*
 - *RECOVERY MANAGER for IMS User Guide*
 - *APPLICATION RESTART CONTROL for VSAM Reference Manual*
- Innovation Data Processing product:
 - *Fast Dump Restore User Manual*
- IBM products:
 - *Data Facility Data Set Services Reference (DFDSS)*
 - *MVS/ESA DFSMSHsm Storage Administration Guide (ABARS)*
 - *MVS/ESA DFSMSHsm Storage Administration Reference (ABARS)*
 - *RAMAC SnapShot for MVS/ESA Implementing SnapShot*
 - *MVS/DFP Access Method Services for the Integrated Catalog Facility*
 - *DFSMS/MVS Managing Catalogs*
 - *Integrated Catalog Forward Recovery Utility Program Description (ICFRU)*
 - *Managing Data Availability in an Integrated Catalog Facility*

To Access Online Books

You can access online books from [the documentation compact disc \(CD\) that accompanies your product](#) or from the World Wide Web. Online books are formatted as Portable Document Format (PDF) files. You can view them, print them, or copy them by using Acrobat Reader.

Note: In some cases, installation of the Acrobat Reader and the online books is an optional part of the product-installation process. For information about downloading the free reader from the Web, go to the Adobe Systems site at www.adobe.com. For information about installing the reader from the documentation CD, see the [readme.txt](#) file on the CD.

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- updates to the installation instructions
- last-minute product information

In addition, BMC Software sometimes provides updated product information between releases (in the form of a flash or a technical bulletin, for example), and maintenance announcements accompany maintenance releases. The latest versions of the release notes and other notices are available on the Web at www.bmc.com/support.

Conventions

This section provides examples of the conventions used in this book and explains how to read ISPF panel-flow diagrams and syntax statements.

General Conventions

The following special elements are used in this manual:

» Important Recommendations

These recommendations tell you how to improve product performance.

Note: Notes provide additional information about the current subject.

Warning! Warnings alert you to situations that could cause problems for you, such as loss of data, if you do not follow the instructions.

All syntax and example JCL are presented in this typeface.

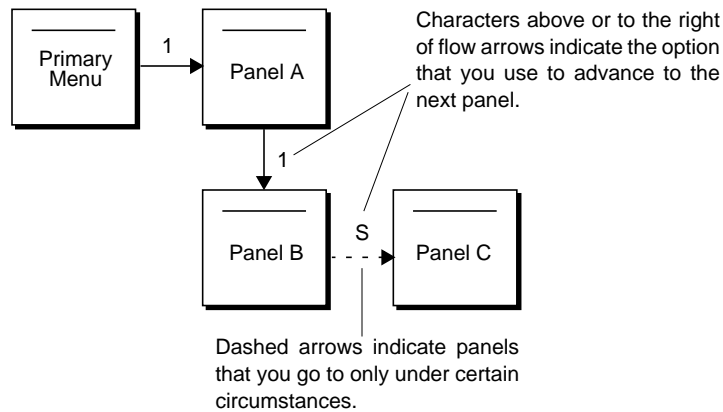
Entries you type are shown capitalized and in bold face type, for example, **SA**.

Field prompts and responses are shown in bold face type, for example, select **Yes** for the **Replace** prompt.

Utility keywords and commands are shown in small capital letters, for example, **COMMAND**.

Panel-Flow Diagrams

Panel-flow diagrams summarize the ISPF panels that you see while completing specific tasks. The following example explains how to read a panel-flow diagram:



Syntax Statements

Syntax statements appear in Courier. The following example shows a sample syntax statement:

```
COMMAND KEYWORD1 [KEYWORD2 |KEYWORD3] KEYWORD4={ YES |NO }
           file_name...
```

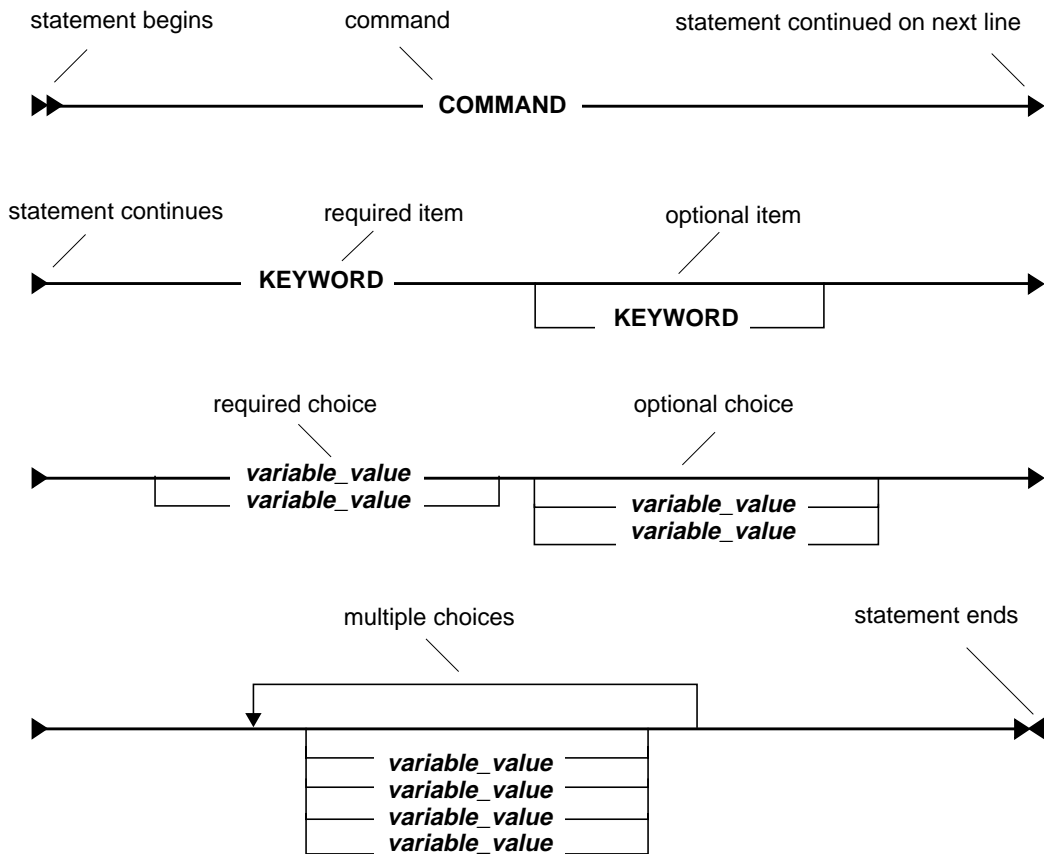
The following table explains conventions for syntax statements and provides examples:

Item	Example
Items in italic type represent variables that you must replace with a name or value. Use an underscore for variables with more than one word.	<code>dtsbackup <i>control_directory</i></code>
Brackets indicate a group of options. You can choose at least one of the items in the group, but none of them is required. Do not type the brackets when you enter the option. A comma means that you can choose one or more of the listed options. You must use a comma to separate the options if you choose more than one option.	<code>[<i>table_name, column_name, field</i>]</code> <code>[-full, -incremental, -level] (Unix)</code>
Unix options are indicated with a hyphen.	
Braces enclose a list of required items. You must enter at least one of the items. Do not type the braces when you enter the item.	<code>{<i>DBD_name table_name</i>}</code> <code>{-a -c} (Unix)</code>

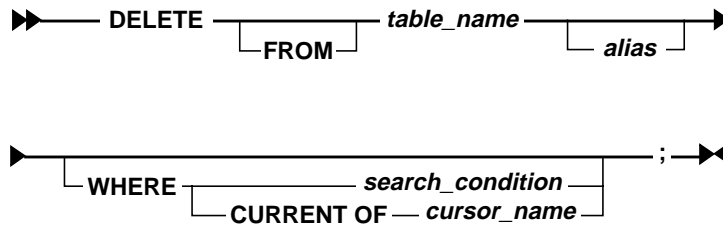
Item	Example
A vertical bar means that you can choose only one of the listed items. In the example, you would choose either <i>commit</i> or <i>cancel</i> .	{commit cancel} {-commit -cancel} (Unix)
An ellipsis indicates that you can repeat the previous item or items as many times as necessary.	<i>column_name</i> . . .

Syntax Diagrams

The following figure shows the standard format for syntax diagrams:



The following example illustrates the syntax for a DELETE statement. Because the FROM keyword, *alias* variable, and WHERE clause are optional, they appear below the main command line. In contrast, the *table_name* variable appears on the command line because the table name is required. If the statement includes a WHERE clause, the clause must contain either a search condition or a CURRENT OF clause. (The *search_condition* variable appears on the main line for the WHERE clause, indicating that this choice is required.)



The following guidelines provide additional information about syntax diagrams:

- A recursive (left-pointing) arrow above a stack indicates that you may choose more than one item in the stack.
- An underlined item is a default option.
- In general, MVS commands, keywords, clauses, and data types appear in uppercase. However, if an item can be shortened, the minimum portion of the MVS command or keyword may appear in uppercase with the remainder of the word in lowercase (for example, CANcel).
- The following conventions apply to variables in syntax diagrams:
 - Variables typically appear in lowercase and are always italicized.
 - If a variable is represented by two or more words, underscores connect the words (for example, *database_name* and *user_ID*).

Summary of Changes

This summary of changes includes changes to product functionality, product enhancements, and other major documentation changes. The summary of changes is listed by product version and release date. All significant changes to this manual since the last release are marked with a revision bar.

Version 1.2.00

April 30, 1999

This release includes the following enhancements:

- Support for Fast Dump Restore Data Set Functions (FDR/DSF) utility backups and recoveries
- Support for DFSMSHsm backup and restore
- Wildcard support in SMF application discovery
- Wildcard support in AR/CTL imports
- Online importing of AR/CTL collector files
- ICF Catalog Maintenance
- ICF catalog forward recovery with Integrated Catalog Forward Recovery Utility (ICFRU)
- Resynchronization of the RECOVERY MANAGER Recovery Assets Catalog (RASCAT)
- Resynchronization of the RECOVERY MANAGER repository
- Support for Recovery Utility for VSAM (RUV) Version 1.1 features
- RMGR server shared with RECOVERY MANAGER *for DB2**
- VSAM AIX data sets added to sizing report

Version 1.1.00

November 30, 1998

New product announcement.

Chapter 1 About RECOVERY MANAGER for OS/390

The RECOVERY MANAGER for OS/390 product by BMC Software is a comprehensive management tool for the backup and recovery tasks necessary for MVS (Multiple Virtual Storage) and OS/390 application and system resources.

A member of BMC Software's Coordinated Recovery Management suite of products, RECOVERY MANAGER provides interactive and batch backup and recovery programs that help define, perform, and validate the backup and recovery process and provide support for disaster recovery.

This chapter introduces and discusses RECOVERY MANAGER as follows:

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Recovery Management Issues

Any software application performs as a business process, which is always important and often critical to the health of a business. When a crucial application fails, business slows or halts until that application can be recovered—and recovery can be a complicated and time-consuming process. Although MVS, OS/390, and CICS (Customer Information Control System) provide utilities to assist in recovery, they do not provide mechanisms for automating the process, nor do they assist in defining application-based recoveries.

To ensure total application recoverability, system programmers must know all MVS system files needed by any one application, whereas storage and data administrators must know all data and other application files required. In addition, storage administrators must set up and manage various utilities such as IBM's Data Facility Data Set Services (DFDSS).

The complexity of preparing for and maintaining recoverability varies from application to application. Applications can be quite complex, changing over time and making it difficult to track all the data required. Many single database management system (DBMS) applications include non-DBMS data sets, which must be available for the application to run. When a recovery is required, all objects must be brought back to the same point of consistency. Serious data integrity problems occur when any required object is omitted from the recovery.

The situation is even more complex when an application spans multiple systems of the same type or of different types (IMS [Information Management System] and MVS, for example). In these cases, coordination and synchronization of the recovery of the different application elements are highly desirable.

In MVS data administration, backups are routinely planned and scheduled. However, recovery can seldom be scheduled for a convenient time and is almost always performed in response to an operating system failure, an application failure, or a hardware failure. In the extreme, recovery is performed in response to a major facility disaster.

It is almost always critical that recovery be performed as quickly as possible because application transactions must wait until recovery is complete. Factors that impact recovery time include the following:

- how the objects to be recovered are identified
- how JCL (Job Control Language) is coded
- how control cards are coded

Timely recoveries are also affected by the operating system programmer's knowledge of the failed application and expertise in using the recovery tools. Determining valid recovery points for all the objects necessary for application recovery and properly grouping all related objects can be complex and time consuming.

A knowledge of the availability of the required items helps to ensure a timely recovery. All required objects must be available—the omission of an object may require an additional recovery and may not be found until an application fails due to data integrity problems. In this situation, the application continues to be unavailable until the additional recovery is performed. A company may face a major disaster if the resources needed for a recovery are not all available when a failure occurs.

Problems may also occur if more objects than necessary are recovered. Data integrity may not be impacted, but recovery time is increased, and the availability of the application is delayed.

Recovery is an activity that administrators hope will rarely be necessary. However, when a recovery is required, it is important that it is performed correctly the first time. The pressure to get a failed business application back online as quickly as possible, coupled with the complicated nature of recovery in general, makes automating the recovery process highly desirable.

BMC Software's Recovery Management Solutions

To solve these recovery management problems, BMC Software has developed RECOVERY MANAGER for OS/390, an interactive multiuser tool that helps you actively manage the backup and recovery processes and the resources for MVS systems.

In addition, BMC Software has developed the COORDINATED RECOVERY MANAGER (CRM™) product, another tool that helps you coordinate application backups and recoveries across multiple systems by interacting with individual system-specific RECOVERY MANAGER installations.

The current coordinated recovery management suite of products includes:

- RECOVERY MANAGER for OS/390, described in this manual
- RECOVERY MANAGER for DB2*, described in the *RECOVERY MANAGER for DB2* User Guide*

- RECOVERY MANAGER for IMS, described in the *RECOVERY MANAGER for IMS User Guide*
- CRM, described in the *COORDINATED RECOVERY MANAGER for MVS User Guide*

Each RECOVERY MANAGER product has the capability of providing support for coordinated recovery management and concurrently performing normal recovery-related tasks in its own domain.

RECOVERY MANAGER for OS/390

RECOVERY MANAGER for OS/390 automates the backup and recovery of MVS data sets in both sysplex and non-sysplex environments and ensures fast and successful task completion. RECOVERY MANAGER lets you plan for various recovery scenarios including volume failure and disaster recovery. RECOVERY MANAGER's features allow you to perform the following tasks:

- identify data sets used by an application
- predefine application groups (group all data sets belonging to an application)
- define appropriate backup and recovery options for each application group
- revalidate the definition of your groups
- audit the recoverability of all objects
- report on availability of data sets needed for recovery
- resynchronization of the Recovery Assets Catalog (RASCAT) and the repository
- enforce recovery rules
- test your recovery plans before failures occur

These features combine to create solutions for most recovery management problems, while providing cost reductions, speed, and accuracy. RECOVERY MANAGER provides the following major benefits:

- reduced costs and time savings in initiating a recovery because of the immediate availability and readiness of a plan that is already tailored to fit the recovery scenario
- reduced costs and time savings in all backup and recovery operations due to the product's ease of use and its ability to automatically generate accurate optimized JCL that guarantees success
- reduced costs and time savings in disaster recovery by providing the following:
 - support for contingency planning at the local site
 - offsite copies of application data sets
 - JCL for recovering applications at a recovery site
 - verification of resources required at the recovery site
- RECOVERY MANAGER provides an additional, equally important but intangible benefit in peace of mind for the system programmer.

Coordinated Recovery Management for MVS

CRM currently manages any required coordination between RECOVERY MANAGER for OS/390, RECOVERY MANAGER for DB2*, and RECOVERY MANAGER for IMS. CRM enables these products to work together to build definitions of applications that span multiple instances of the same DBMS or combinations of different DBMSs. CRM can manage these tasks across multiple MVS systems.

CRM takes advantage of the functions provided by the individual RECOVERY MANAGER installations to bridge the products and effectively coordinate and synchronize backup and recovery activities. This result is accomplished without affecting the capability of individual RECOVERY MANAGER installations to be used concurrently with, and independently of, CRM.

When it is necessary to recover data across multiple systems, CRM enables you to plan and analyze recoveries in advance so that data loss and recovery times can be minimized. You can plan a recovery from the point of view of an application rather than a specific volume, DBMS, or MVS system.

See the *COORDINATED RECOVERY MANAGER for MVS User Guide* for detailed information about coordinated recoveries. Also, see Chapter 7, "Coordinated Recovery Support" in this manual for details about the coordinated recovery support provided by RECOVERY MANAGER for OS/390.

RECOVERY MANAGER Concepts and Functionality

RECOVERY MANAGER for OS/390 allows you to prepare backup and recovery JCL for many application and system failure scenarios. With RECOVERY MANAGER, you can prepare for disaster recovery and recover your applications and system resources at a recovery site in both sysplex and non-sysplex environments. RECOVERY MANAGER can generate JCL that specifies one or more IBM or BMC Software utilities.

RECOVERY MANAGER assists you in identifying the data sets that make up an application group. After you have created an application group, you can also select backup or recovery options sets for the group and save the group with those options for future use. You can then retrieve and revalidate the group and generate updated backup or recovery JCL in batch mode or online at your convenience. In noncoordinated backups and recoveries, all functions can be performed interactively through the RECOVERY MANAGER Interactive System Productivity Facility (ISPF) menu-driven user interface; however, you have the option to perform many recovery functions in batch mode. In coordinated backups and recoveries, supported RECOVERY MANAGER functions are performed through CRM's online or batch components.

The following sections describe the resources required by RECOVERY MANAGER for OS/390 and the functions it can perform in its own domain:

- “Resources Used by RECOVERY MANAGER” on page 1-7
- “Defining Application Groups for Backup or Recovery” on page 1-9
- “Specifying Utilities and Syntax Options” on page 1-10
- “Validating and Revalidating Application Groups” on page 1-12
- “Generating and Executing Backup and Recovery JCL” on page 1-12

An overview of the functional support provided for CRM is described in “RECOVERY MANAGER Functions Available to CRM” on page 1-14.

Resources Used by RECOVERY MANAGER

Figure 1-1 on page 1-8 shows the resources that RECOVERY MANAGER for OS/390 may use when you create backup or recovery JCL. These resources are briefly described as follows:

- When you group application data sets or system data sets or when you revalidate an existing group, RECOVERY MANAGER uses the MVS catalog as necessary and stores the group information in RECOVERY MANAGER's VSAM (Virtual Storage Access Method) repository.
- RECOVERY MANAGER registers its backup information in the Recovery Assets Catalog (RASCAT).
- Through an interface to RECOVERY UTILITY for VSAM (RUV™), RECOVERY MANAGER accesses backups and archives in the RUV repository.
- RECOVERY MANAGER can read System Management Facilities (SMF) data to identify application resources.
- An interface to APPLICATION RESTART CONTROL (AR/CTL™) allows RECOVERY MANAGER to query application data set access history.
- Through an interface with IBM's ABARS (Aggregate Backup and Recovery Support), RECOVERY MANAGER has access to the backups in the ABARS backup control data set.

When the JCL runs, the utilities that can be used include the following:

- BMC Software's RUV
- BMC Software's EXTENDED BUFFER MANAGER for CICS with SNAPSHOT COPY for VSAM (XBM™ with SCV™)
- IBM's DFDSS utility
- IBM's IDCAMS utility
- IBM's RAMAC SnapShot for MVS/ESA utility
- IBM's ABARS function
- IBM's DFSMSHsm utility
- Innovation Data Processing's FDR DSF product

Figure 1-1 on page 1-8 also shows how RECOVERY MANAGER and CRM communicate with each other. For more information, see "How RECOVERY MANAGER Works with CRM" on page 1-13.

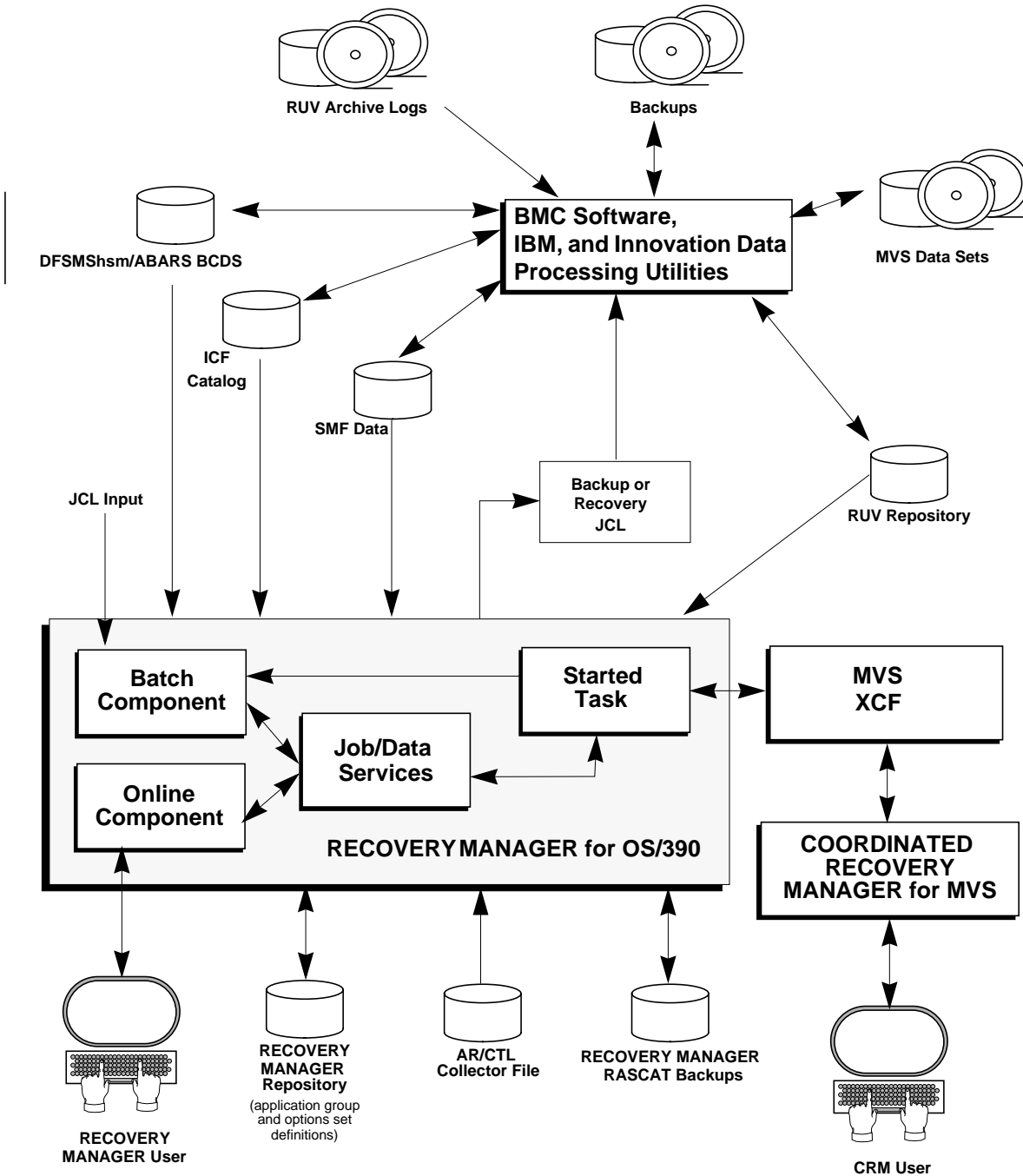


Figure 1-1 How Recovery Management Works

Defining Application Groups for Backup or Recovery

An application group is a collection of all the data sets that are required to recover one or more applications. With RECOVERY MANAGER you can create application groups in a variety of ways, all of which are described in the following list. See “Defining Groups in RECOVERY MANAGER” on page 3-5 for more information.

- data set name pattern

Groups can be defined by data set name patterns. You can use wildcards in most cases to provide fast and flexible data set identification. Once identified, these data sets can be added to an existing group or used to create a new group.

- library scan

When you provide an input partitioned data set name or sequential file name, the JCL scan program scans and tracks all data sets listed in either all DD statements of your JCL or in just the JOBLIB and STEPLIB statements. Once identified, these data sets can be added to an existing group or used to create a new group.

- volume

In foreground execution, RECOVERY MANAGER identifies the data sets for which it has registered backups on the selected DASD volumes. Backups may be registered in RASCAT or in the RUV repository (if RUV is installed), but not in ABARS. In background execution, RECOVERY MANAGER identifies all data sets contained on the specified DASD volumes. This identification allows you to define volume groups prior to a volume failure.

- SMF data (job name) scan

Groups defined by job names contain the data sets accessed by those jobs within an optional specified time range. This information is captured from SMF data and is useful for identifying an application’s resources. Once identified, these data sets can be added to an existing group or used to create a new group.

Note: If you are using concatenated data sets, the SMF data scan picks up only the first data set in the concatenation.

- ABARS import

RECOVERY MANAGER can read the ABARS aggregate definition and create groups defined by the data sets in a single ABARS aggregate.

- AR/CTL import

Groups defined by BMC Software's AR/CTL include data sets listed within an optional specified time range in the AR/CTL collector file for a set of job names specified.

- Integrated Control Facility (ICF) catalog

Groups selected by ICF catalog include data sets that comprise the current ICF catalog structure. This option allows you to back up user catalogs in the catalog structure.

- RUV import

These groups are built from data sets found in BMC Software's RUV repository.

Specifying Utilities and Syntax Options

In RECOVERY MANAGER for OS/390, utility options for backups and recoveries are specified in advance and saved as a named set, allowing multiple application groups to use the same set of utility options. Your organization can have multiple utility options sets for use with different application groups. You can also create a system-wide set of utility options. If no utility options are set, RECOVERY MANAGER provides automatic defaults.

Backup Options

You can specify the utilities and the appropriate utility options to be used to back up application groups. RECOVERY MANAGER generally uses the default syntax values supplied by the backup utility chosen. You can specify different utilities for VSAM and non-VSAM backups. DFDSS is the default utility for backing up both VSAM and non-VSAM data sets.

Warning! Utility options sets can be changed to meet a particular requirement, but remember that changing the options impacts all application groups using that utility options set.

See Chapter 4, "Working with Utility Options" for more information about utility options.

The following backup utilities are supported:

- For non-VSAM data sets
 - IBM's Data Facility Data Set Services (DFDSS) utility
 - IBM's Aggregate Backup and Recovery Support (ABARS) function
 - IBM's RAMAC SnapShot for MVS/ESA utility
 - Innovation Data Processing's Fast Dump Restore Data Set Functions (FDR DSF) utility
 - IBM's Data Facility Hierarchical Storage Manager (DFSMSHsm)
- For VSAM data set
 - IBM's DFDSS utility
 - IBM's ABARS function
 - IBM's RAMAC SnapShot for MVS/ESA utility
 - Innovation Data Processing's Fast Dump Restore Data Set Functions (FDR DSF) utility
 - IBM's Data Facility Hierarchical Storage Manager (DFSMSHsm)
 - IBM's IDCAMS utility
 - BMC Software's RUV
 - BMC Software's XBM with SCV utility

Note: You can mix IBM, Innovation Data Processing, and BMC Software utilities in the same group. You can also select one utility for VSAM data sets and another for non-VSAM data sets.

Recovery Tasks

For recovery tasks, RECOVERY MANAGER provides a set of default recovery syntax values that you can use for all recovery scenarios. *These are not necessarily the defaults provided by the recovery utility used.* You can change some syntax values to meet a particular requirement for an application group. You can specify recovery to one of the following:

- a selected backup (defaults to the last backup)
- a point in time prior to a specified point (defaults to current)

Both types of recovery can be specified online and in batch mode. See the following sections for more information:

- “Online Recovery Job Generation” on page 5-8
- “Generating JCL for a Recovery to a Point in Time” on page 5-12
- “Batch Recovery Job Generation” on page 5-19

The recovery utility used depends on the type of backup that was made. In general, the same utility used for backup is used for recovery.

Validating and Revalidating Application Groups

After you have created a group, all objects in the group are validated for their availability to MVS and their eligibility for recovery. If RECOVERY MANAGER encounters a problem with an object, an appropriate status is returned for that object. These non-OK statuses may be handled differently in a recovery situation or in a backup situation. See “Responding to Unsatisfactory Object Status” on page 3-41 for more information.

After initial validation is complete, you can save the group to the RECOVERY MANAGER repository and then periodically revalidate it to determine whether any changes that affect the recoverability of the group (as it was initially defined) have taken place. If changes have occurred, they are reported and can be implemented automatically.

Whenever a recovery point is selected, the objects are also validated for recoverability. Revalidation can be performed online or by using the batch program MRMBGPV. See “Object Validation” on page 3-39 for more information.

Backing Up and Recovering System Resources

The RECOVERY MANAGER repository and RASCAT must be backed up on a regular basis to ensure application recoverability. See Chapter 6, “Managing System Resources,” for more information on this topic.

Generating and Executing Backup and Recovery JCL

RECOVERY MANAGER verifies the status of all objects required for backup or recovery. Before generating backup JCL, it confirms that all objects defined in the application group are available for backup. Before generating recovery JCL, it verifies that all objects in the application group are recoverable to the specified recovery point. Unsuitable object status is reported, and alternative recovery points or methods can often be used to recover objects with unsuitable status. You can then save the group or generate JCL. You can retrieve a saved group from the RECOVERY MANAGER repository at any time, revalidate it, and then generate JCL.

You can also use the batch program MRMBGEN to generate JCL for one or more existing groups. MRMBGEN can be run when needed to generate up-to-date backup and recovery JCL for the specified group or groups.

How RECOVERY MANAGER Works with CRM

The CRM for MVS product is distributed on the same tape as RECOVERY MANAGER for OS/390 and can be installed at the same time. CRM definitions are initially defined during installation and can be maintained through the CRM user interface. See the *Backup and Recovery Products for DB2 and OS/390 Installation Guide* for more information.

About CRM Domains

To allow CRM to coordinate backup or recovery processing of specific applications across multiple DBMS and non-DBMS environments (across multiple RECOVERY MANAGERS), you must define a processing domain and an MVS cross-coupling facility (XCF) during CRM installation. A single CRM domain consists of the following major components and can include MVS, IMS, and DB2 systems:

- an XCF group that provides communications between CRM and each RECOVERY MANAGER (whether for OS/390, IMS, or DB2) in the domain
- a CRM repository
- RECOVERY MANAGER products required to back up or recover the target applications

Multiple CRM domains can be defined, each with its own repository and XCF group. A single RECOVERY MANAGER can “belong” to multiple CRM domains.

Communications Between RECOVERY MANAGER and CRM

The name of the XCF group is stored in the CRM domain repository and is supplied to RECOVERY MANAGER via input to the RECOVERY MANAGER MRMXSTC program, also known as the Recovery Manager server. Both CRM and the Recovery Manager server separately monitor (through the XCF communications link) all instances of RECOVERY MANAGERS joining and leaving the XCF group. Each RECOVERY MANAGER can join or leave the XCF group dynamically.

The RECOVERY MANAGER server can be run as a batch job or started task and provides support for CRM requests directed to the MVS system specified by the job or task.

More than one RECOVERY MANAGER server can operate concurrently in the same MVS system and the same MVS system can be referenced by more than one RECOVERY MANAGER server.

When CRM makes a request to RECOVERY MANAGER through the XCF communications link, the RECOVERY MANAGER server program converts the request to a suitable form for processing. When the request has been processed, a reply (in an appropriate form) is returned to CRM by the RECOVERY MANAGER server via the same communications link. How the reply is made available to the CRM user is determined by CRM.

CRM users can exercise control of the RECOVERY MANAGER server program using MVS operator commands. Details of the commands available for this purpose are discussed in “Control Commands for the Server” on page 7-7.

RECOVERY MANAGER Functions Available to CRM

The following RECOVERY MANAGER functions are currently available through CRM. Some of these are specific to CRM users and are not available through the RECOVERY MANAGER user interface. See Chapter 7, “Coordinated Recovery Support” in this manual and the *COORDINATED RECOVERY MANAGER for MVS User Guide* for more information.

List RECOVERY MANAGER Groups

A CRM user can request a listing of one or more existing RECOVERY MANAGER groups by specifying a name or wildcard pattern at the CRM interface.

View RECOVERY MANAGER Groups

A CRM user can request a list of the objects in a specified RECOVERY MANAGER group for display on the CRM console.

List RECOVERY MANAGER Recovery Points for a Group

A CRM user can request a list of recovery points for a group by specifying a time range for the recovery points and an existing RECOVERY MANAGER group.

Note: A recovery point is a backup or an RUV archive.

Create a Volume Group

A CRM user can request the creation of a group containing objects on a volume by specifying one or more volume names. A group is created by RECOVERY MANAGER and saved in the RECOVERY MANAGER repository. In addition, the name of the group is sent to CRM.

Generate and Hold a Coordinated Recovery Point

A CRM user can request that RECOVERY MANAGER generate one or more recovery points for the objects in one or more specified groups. CRM stores the coordinated recovery points in its repository for future use. RECOVERY MANAGER can be instructed to close CICS data sets.

Note: A recovery point is a backup or an RUV archive.

Generate a Recovery Point for Coordinated Disaster Recovery

RECOVERY MANAGER includes facilities for providing a coordinated disaster recovery point on request from CRM. A CRM job can be scheduled to establish a recovery point for disaster recovery purposes across multiple RECOVERY MANAGERS. A recovery point is established without requiring any outage to MVS. The RECOVERY MANAGERS involved use the recovery point established by the process to bring all systems involved to the same point in time at the disaster recovery site.

Report Recovery Assets and Audit Recoverability

A CRM user can request the following reports from RECOVERY MANAGER for a specified group or groups:

- revalidation of the application group's population
- object (data set) recoverability
- recovery resources required by the group

Generate and Execute a Backup

A CRM user can request that RECOVERY MANAGER generate backup JCL. Only unsynchronized backups can be requested. CRM invokes RECOVERY MANAGER to generate and run the JCL when required.

RECOVERY MANAGER uses the batch program MRMBGEN to generate backup JCL using the specified backup utility, then informs CRM of the location of the JCL. CRM then invokes RECOVERY MANAGER to run the JCL when required. RECOVERY MANAGER returns the job name and job IDs to CRM after successful completion of the backup JCL.

Generate and Execute a Recovery

A CRM user can request that RECOVERY MANAGER generate recovery JCL for a specified group or groups. RECOVERY MANAGER uses the batch program MRMBGEN to generate the recovery JCL and informs CRM of the location of the JCL. CRM invokes RECOVERY MANAGER to execute the JCL when required.

RECOVERY MANAGER returns the job names and job IDs to CRM after successful completion of the recovery JCL.

Additional RECOVERY MANAGER Features

In addition to the features already described, RECOVERY MANAGER also:

- allows the use of symbolic variables in backup data set names
- provides both interactive and batch modes for revalidating application groups
- reports application groups that are not recoverable to the current time
- reports the resources required to perform a recovery, if desired
- provides group authorization capabilities to control the use of an application group and to establish who can make permanent changes to a group
- provides safeguards against different users concurrently attempting to save changes to the same group
- supports repository versioning (the ability to preserve options profiles for future releases)
- maintenance of ICF catalogs
- automation of Integrated Catalog Forward Recovery Utility (ICFRU)
- resynchronization of RASCAT and the repository

Software Requirements

RECOVERY MANAGER for OS/390 is supplied on BMC Software's Backup and Recovery SIS distribution tape together with RECOVERY MANAGER for DB2*, COPY PLUS, RECOVER PLUS, R+/CHANGE ACCUM® for DB2*, PACLOG™ for DB2*, R+/RESOURCE MAXIMIZER® for DB2*, and other utilities. CRM is also supplied on the distribution tape and must be installed if you plan to perform coordinated recoveries.

The *minimum* requirements for the software environment required for this release of RECOVERY MANAGER are as follows:

- operating system requirements:
 - MVS/XA, MVS/ESA, or OS/390 for noncoordinated recoveries
 - MVS/ESA version 4.2, or OS/390 if you install CRM
- MVS/DFP version 3.1
- ISPF version 3.1
- DFDSS version 2.5

To benefit from all of RECOVERY MANAGER's features, the following utilities are recommended at the minimum versions noted:

- BMC Software's RUV version 1.1 for journaled VSAM
- BMC Software's XBM with SCV version 4.1 to use the XBM with SCV options
- IBM's DFSMS/MVS version 1.2 to use the ABARS options
- ISPF 2.1 and RAMAC SnapShot for MVS/ESA 1.2 to use the RAMAC options
- Innovation Data Processing's Fast Dump Restore Data Set Functions version 5.2
- IBM's DFSMSHsm
- CICS 4.1 or higher to use the CLOSE capability for requests for a coordinated get-and-hold recovery point.

Chapter 2 **Getting Started with RECOVERY MANAGER**

This chapter discusses the user interface, authorizations, utility options, and other information that will help you start using RECOVERY MANAGER for OS/390.

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Using RECOVERY MANAGER

Before using RECOVERY MANAGER for the first time, familiarize yourself with the following information in this chapter:

- installation and load library considerations, backing up the RECOVERY MANAGER repository, and enhancing RECOVERY MANAGER performance in “Before You Begin” on page 2-4
- RECOVERY MANAGER task flow, the Main Menu, and other panels in “RECOVERY MANAGER Overview” on page 2-6
- authorizations required to use RECOVERY MANAGER in “RECOVERY MANAGER Authorizations” on page 2-11
- supported utilities in “Utilities Supported by RECOVERY MANAGER” on page 2-26

RECOVERY MANAGER supports IBM, Innovation Data Processing, and BMC Software utilities.

- system resource backup and recovery in “System Resource Backup, Recovery, and Maintenance” on page 2-27

RECOVERY MANAGER allows you to automate RECOVERY MANAGER system resource backup and recovery.

- information on backup and recovery options in “Application Group Backup and Recovery” on page 2-28

RECOVERY MANAGER lets you tailor your backups and recoveries by application group.

- help panels, online overview, and error messages in “Online Help and Messages for RECOVERY MANAGER” on page 2-31

Before You Begin

This section provides information about aspects of RECOVERY MANAGER that require special consideration and may require additional actions before you begin using RECOVERY MANAGER for backup and recovery purposes.

Load Libraries for RECOVERY MANAGER

RECOVERY MANAGER ships with the product library and the SAS/C transient libraries from SAS Institute Incorporated. A copy of the SAS/C library version 6.0 is unloaded from the distribution tape to the designated load library. The Install System allows you to choose to *not* unload the SAS/C transient library.

Note: When installing RECOVERY MANAGER, you can choose not to unload the SAS/C transient library. However, you must make sure that an SAS/C transient library is in the linklist and is version 6.0 or later.

If you place BMC Software products in the linklist, you must ensure that the concatenation of the link-listed data sets is such that the data set containing the most recent release of the SAS/C transient library is concatenated ahead of any other data sets containing older SAS/C releases. This factor is especially important if you have products from several third-party vendors who also distribute the SAS/C transient library.

See the *Backup and Recovery Products for DB2 and OS/390 Installation Guide* for detailed information about SAS/C libraries.

CRM and RECOVERY MANAGER Installation Considerations

COORDINATED RECOVERY MANAGER (CRM™) can be installed either from the SIS distribution tape or from the RECOVERY MANAGER for IMS distribution tape. If you have already installed a version of CRM, ensure that any other version you install is an equal or later release level.

The recommended version of CRM for use with the current version of RECOVERY MANAGER for OS/390 is CRM 1.3.01.

Note: If you are installing CRM for the first time, be aware that the minimum requirement is MVS/ESA version 4.2 or OS/390. See “Software Requirements” on page 1-17 for more information.

See the *Backup and Recovery Products for DB2 and OS/390 Installation Guide* for more information about installing CRM from the SIS distribution tape.

Safeguarding System Resources for RECOVERY MANAGER

The system resources of RECOVERY MANAGER for OS/390 include the RECOVERY MANAGER repository, which stores all information related to application groups and utility options sets, and the RECOVERY MANAGER Recovery Assets Catalog (RASCAT), which tracks backups.

As soon as possible after installing RECOVERY MANAGER, make backup copies of both the repository and RASCAT for safekeeping. See Chapter 6, “Managing System Resources” for instructions.

In some recoveries, it may be important to recover objects in a certain order. See “Repository Availability Considerations” on page 8-3 for details.

Note: In the event of a system failure involving the RECOVERY MANAGER repository, you can continue to use RECOVERY MANAGER to create groups and generate JCL (Job Control Language); however, you cannot save group information or retrieve information already saved.

RECOVERY MANAGER Overview

This section provides an overview of the tasks you can perform with RECOVERY MANAGER and a description of the user interface.

Task Overview for RECOVERY MANAGER

The tasks you can perform with RECOVERY MANAGER fall into the following major categories. Figure 2-1 on page 2-7 shows the general flow of those tasks.

- creating application groups
- creating sets of utility options to assign to those groups
- generating backup JCL, recovery JCL, and reports for those groups
- generating backup or recovery JCL for RECOVERY MANAGER system resources

You can also perform coordinated recovery-related tasks (not shown in Figure 2-1).

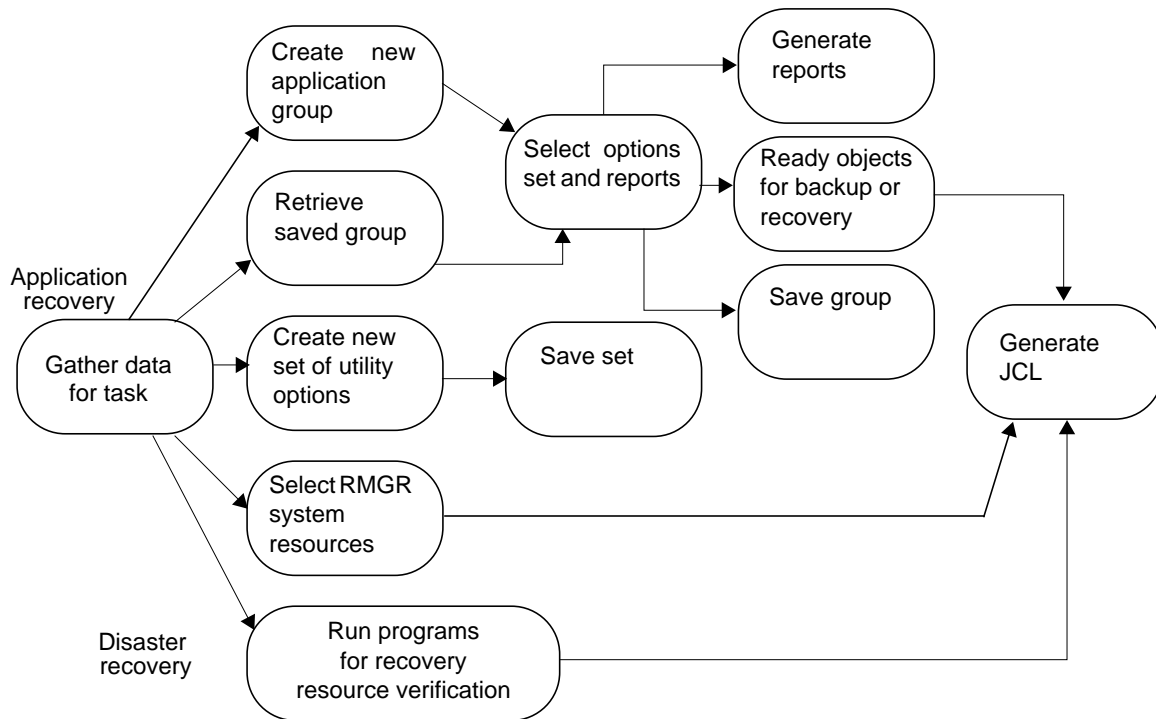


Figure 2-1 Processing Objects and Resources for Backup and Recovery

Following are examples of tasks you can perform with RECOVERY MANAGER.

To generate backup JCL for a new application group:

1. Identify the objects required by an application and save them in a new group.
2. Select a set of utility options and assign it to the group, or accept the system-wide or product defaults. (You can create and save a new set of utility options if necessary.)
3. Generate backup JCL for the group.

To generate recovery JCL for an existing application group:

1. Select an existing application group.
2. Optionally revalidate the group.
3. Generate recovery JCL.

To provide for system resource recovery and application recovery at a disaster recovery site, generate the following:

1. offsite copies of system resources and application data sets for RECOVERY MANAGER
2. JCL to recover those resources and applications at the recovery site

To perform coordinated recovery-related tasks, RECOVERY MANAGER must be registered with a CRM and requests for all such tasks must be initiated from the CRM.

You can start all RECOVERY MANAGER tasks (except coordinated recovery tasks) at the Main Menu (an ISPF [Interactive System Productivity Facility] panel). When you select a Main Menu option, other panels are displayed in sequence, each requiring you to respond by selecting further options or typing required information.

Instructions for performing RECOVERY MANAGER tasks are provided in:

- Chapter 3, “Creating and Working with Groups”
- Chapter 4, “Working with Utility Options”
- Chapter 5, “Backing Up and Recovering Groups”
- Chapter 6, “Managing System Resources”

For information about coordinated recovery tasks, see the following:

- Chapter 7, “Coordinated Recovery Support”
- *COORDINATED RECOVERY MANAGER for MVS User Guide*

Main Menu and Other RECOVERY MANAGER Panels

The RECOVERY MANAGER Main Menu (see Figure 2-2 on page 2-9) allows you to perform the following tasks:

- display and update application groups saved to the RECOVERY MANAGER repository
- create new application groups for backup and recovery
- display, add, or maintain sets of utility options
- display and update control information for RECOVERY MANAGER
- generate JCL to back up or recover system resources for RECOVERY MANAGER

- view and select BMC Software’s RECOVERY UTILITY for VSAM (RUV™) subsystem (if RUV is installed)
- access RECOVERY MANAGER general information (online help)

To access the RECOVERY MANAGER Main Menu, use the method employed at your company. If you want to return to the Main Menu while you are in RECOVERY MANAGER, press **F3** until the Main Menu appears.

Select a Main Menu option by providing the following:

- option number
- subsystem ID for RUV processing (if RUV is installed)
- whether to perform RECOVERY MANAGER tasks as a local site system or as a recovery site system

```

===== V1.2.00 - RMGR for OS/390* - Main Menu =====
Command ==> _____

Type selection. Then press Enter.

_ 1. Application groups      - Backup, restore or maintain application groups
  2. Appl. group definition - Select object(s) for an application group
  3. System resources       - Backup or recover system resources
  4. Utility options        - Browse or edit utility options
  5. Control information    - Browse or edit RMGR control information
  6. BMC subsystems        - View or select BMC subsystems for RU for VSAM

BMC subsystem name for RU for VSAM . . _____
Site type. . . . . 1 1. Local  2. Recovery

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```

Figure 2-2 RECOVERY MANAGER Main Menu

As you use RECOVERY MANAGER, you will encounter different types of panels depending on the task you are performing. Examples of panel types are listed below. Each panel contains instructions for its use.

- panels for application groups and data set lists that allow you to specify the action you want to perform on an application group (see “Group Actions” on page 3-17)

Figure 2-3 contains an example listing data sets (objects) included in a group, along with their status and data set type. To perform an action on one of the objects, type one of the listed action codes in the **Act** column; the previous action (if any) on an object is shown in the unmarked column to the right of **Act**.

- panels that allow you to select a set of backup and recovery utility options for use with the application group
- panels that allow you to create and save sets of backup and recovery utility options
- panels that allow you to display and maintain group information

```

===== Data Set List - RDAJXH  APPLGROUP                               Row 1 of 3
Command ==> _____ Scroll ==> PAGE

Type option or action code.  Then press Enter.
Option.  . _ 1. Recovery type    2. Group edit    3. Gen recover JCL background
          4. Gen backup JCL    5. Add objects to group
Action code(s) T=LISTC X=Exclude
Act   Type  Stat  DSName
_     VSAM DC  INFO  BMCXXX.QA.MRME0010.DATA
_     VSAM DC  INFO  BMCXXX.QA.MRMK0010.DATA
_     NONVSAM OK   BMCXXX.TEST.VSAM.DATSET89
***** Bottom of data *****

```

Figure 2-3 Example of a Data Set List Panel

In the RECOVERY MANAGER panels, you can display standard ISPF function keys using the ISPF command PFSHOW ON or turn them off using PFSHOW OFF.

The main keys used in RECOVERY MANAGER are:

- **Enter** — confirms to RECOVERY MANAGER that your actions in the current panel are complete
- **F3** — returns you to the preceding panel

Press this key while browsing to return to the prior panel. When you press it after making changes, you are given the opportunity to save the information before returning to a preceding panel. Press it while viewing a Help panel to return to the parent RECOVERY MANAGER panel.

- **F1** — displays a Help panel corresponding to the RECOVERY MANAGER panel currently displayed

Press **F1** in the Main Menu to display a help menu that allows you to view general information about RECOVERY MANAGER. Press it when a message appears to display additional information about the condition that caused the message. See “Online Help and Messages for RECOVERY MANAGER” on page 2-31 for more information.

RECOVERY MANAGER Authorizations

This section describes the authorizations you need to access RECOVERY MANAGER, work with application groups, and run backup or recovery JCL. The authorizations are as follows:

- user authorization
- group authorization
- utility options set authorization
- Authorized Program Facility (APF) authorization
- system resource authorizations for RECOVERY MANAGER
- utility authorizations
- customization of authorizations
- authorization to use DELETE and REDEFINE options
- authorization to use batch group revalidation
- authorization to use batch JCL generation
- authorizations needed by CRM users of RECOVERY MANAGER
- authorization to change control information for RECOVERY MANAGER

Note: See BMC Software’s *Backup and Recovery Products for DB2 and OS/390 Installation Guide* for information about authorizations required for installation.

ABARS Group Authorization

When using ABARS (Aggregate Backup and Recovery Support), you must have the following authorizations:

- **Read** access for the selected data sets in the aggregate if you intend to import ABARS information or validate an ABARS group
- **Read** access for the SMS (Storage Management Subsystem) source control data set to import ABARS group information
- authority to issue the DFSMSHsm LIST command to retrieve the list of ABARS backups used for recovery JCL generation and group validation

MRMSAUTH User Authorization

RECOVERY MANAGER uses MVS (Multiple Virtual Storage) system information to identify the user's primary logon ID. To identify any security group connections, RECOVERY MANAGER uses the MRMSAUTH and MRM3@ATH modules. These modules implement an SAF (Source Address Field) environment identification using RACROUTE services. SAF must be enabled in your environment for these routines to work properly. If your environment does not support SAF, you must provide a replacement for MRM3@ATH. See "Customization of Authorizations" on page 2-17 for more information.

Application Group Authorization

Each RECOVERY MANAGER application group has an owner (creator) who can give authority for that group to any number of users. In addition to the creator, only authorized users can access and save application groups. Any user can display a list of group names, but only the creator or authorized users for a group have display, update, or delete capabilities for that group.

Naming a New Group

Each application group name includes the authorization ID of its creator. When you create a new group, RECOVERY MANAGER identifies it (until you save it under another name) as *creator.UNNAMED_GROUP*. The variable *creator* is your primary user ID.

If you save the application group to the RECOVERY MANAGER repository, the group is saved as *creator.name*. The variable *name* is a long ID string of your choice. If the string contains special characters, it must be delimited by double quotation marks.

When you save a new application group or save an existing application group under a different name, you can change the group's creator name to one of your security group connections. However, RECOVERY MANAGER can verify your security group connection *only when the program module MRMSAUTH has been APF authorized and is located in an APF-authorized library* (see "APF Authorization" on page 2-16). If RECOVERY MANAGER cannot verify your security group connection, you can use only your primary user ID as the creator part of the group name.

Note: You can also use PUBLIC as the creator. This gives access to the group to all users of RECOVERY MANAGER.

Adding or Revoking Authorized Users

You can add or delete (revoke) authorized users of an application group through the Group Edit Authorization panel (see "Changing Authorizations for Utility Options Sets" on page 3-36). Although RECOVERY MANAGER tracks the ID of the grantor of another user's authorization, revoking a grantor's authorization will not affect the authorizations of grantees.

Types of Authorization

RECOVERY MANAGER provides the following types of user authorization for an existing application group:

- Type A (**All**) provides the authority to view, change, and delete an application group and generate JCL.
- Type O (**Open**) provides the authority to view an application group but does not allow the user to delete or save changes to the group. However, with **Open** authorization, a user can still generate backup and recovery JCL.

In addition, RECOVERY MANAGER provides a PUBLIC authorization, which allows any user to open or save application groups. PUBLIC can be used as the creator part of a group name.

Some Authorization Scenarios

The following examples show how authorizations can be implemented to satisfy different requirements:

- An application group that is used and maintained by an individual is assigned that user's primary ID as the creator part of the name. Access can be provided to other users as needed.
- An application group that is used and maintained by several users is assigned a security group connection that represents those users. This is a more flexible implementation because it gives access to all members of the security group and avoids duplicate security administration between RECOVERY MANAGER and the security package.
- Type O authorization is provided to a user who generates backup or recovery JCL. The user is allowed to make changes to the "working" group but is not allowed to save it to the RECOVERY MANAGER repository.

Authorization for Utility Options Sets

Each utility options set for RECOVERY MANAGER has an owner (creator) who can give authority for that set to any number of users. In addition to the creator, only authorized users can maintain and save sets. Any user can display a list of set names, but only the creator or authorized users for a set have display, update, or delete capabilities for that set.

Naming a New Utility Options Set

Each utility options set name includes the authorization ID of its creator. When you create a new set, RECOVERY MANAGER identifies it (until you save it under another name) as *creator.UNNAMED_OPTIONS*. The variable *creator* is your primary user ID.

If you save the set to the RECOVERY MANAGER repository, the set is saved as *creator.name*, where *name* is a long ID string of your choice. If the string contains special characters, it must be delimited by double quotation marks.

Note: The creator's primary logon ID is automatically added as an authorized user with **All** authority.

When you save a new set or save an existing set under a different name, you can change the set's creator name to one of your security group connections. However, RECOVERY MANAGER can verify your security group connection *only when the program module MRMSAUTH has been APF authorized and is located in an APF-authorized library* (see "APF Authorization" on page 2-16). If RECOVERY MANAGER cannot verify your security group connection, you can use only your primary user ID as the creator part of the set name.

Note: You can also use PUBLIC as the creator. Doing so gives all users of RECOVERY MANAGER access to the set.

The system default set of utility options has BMC\$\$\$\$ as its creator.

Adding or Revoking Authorized Users

You can add or delete (revoke) authorized users of a utility options set through the Utility Options Authorization panel (see "Changing Authorizations for Utility Options Sets" on page 3-36). Although RECOVERY MANAGER tracks the ID of the grantor of another user's authorization, revoking a grantor's authorization does not affect the authorizations of grantees.

Types of Authorization

RECOVERY MANAGER provides the following types of user authorizations for an existing set of utility options:

- Type A (**All**) provides the authority to view, assign for use by an application group, change, or delete a set of utility options.
- Type O (**Open**) provides the authority to view or assign a set of options for use by an application group, but does not allow the user to delete or to save any changes to the set.

In addition, RECOVERY MANAGER provides a PUBLIC authorization, which gives any user **All** authorization. PUBLIC can be used as the creator part of a set name.

Some Authorization Scenarios

The following examples show how authorizations can be implemented to satisfy different requirements:

- A utility options set that is used and maintained by an individual is assigned that user's primary ID as the creator part of the name. Access can be provided to other users as needed.
- A utility options set that is used and maintained by several users is assigned a security group connection that represents those users. This is a more flexible implementation because it gives access to all members of the security group and avoids duplicate security administration between RECOVERY MANAGER and the security package.
- Type O authorization is provided to a user who generates backup or recovery JCL. The user is allowed to make changes to the "working" set of utility options but is not allowed to save it to the RECOVERY MANAGER repository.

APF Authorization

RECOVERY MANAGER requires APF authorization for all load modules except MRMUSEL, MRMUMAN, and MRMBGEN, which are ISPF programs.

The name MRMSAUTH must be added to the AUTHPGM NAMES section of member IKJTSO00 in SYS1.PARMLIB. RECOVERY MANAGER uses the MRM3@ATH program to acquire your associated security group connections. It supports the SAF security interface. If SAF is not supported in your environment, replace MRM3@ATH with your own module. See "Customization of Authorizations" on page 2-17 for more information.

For more information about authorizations for MRMBGPV and MRMBGEN, see the following sections:

- "Authorization to Use Batch Group Revalidation" on page 2-18
- "Authorization to Generate JCL" on page 2-19

Customization of Authorizations

If your environment does not support SAF, you can create a customized MRM3@ATH module that will associate security group connections with a user. This module should accept two parameters: the primary ID of the user and an address of storage to hold the security group connections.

The module should be able to list the security group connections based on the primary ID (first parameter). The ID entries are eight bytes in length and padded with blanks. The storage allocated holds a maximum of 254 eight-byte IDs. The load module must be linked to AMODE(31).

System Resource Authorization

If you have authority to access RECOVERY MANAGER, you can also access the system resource backup and recovery feature for RECOVERY MANAGER and generate the associated JCL. However, because RECOVERY MANAGER does not submit the JCL, it does not verify the authority of a user to run the following utilities that can be included in the JCL:

- IBM's IDCAMS
- IBM's RAMAC SnapShot Copy
- IBM's DFSMSHsm
- IBM's DFDSS
- BMC Software's RUV
- BMC Software's XBM
- IBM's ABARS function (ABACKUP and ARECOVER)
- Innovation Data Processing's FDR DSF

The utilities also require that you have physical data set authority for the target data sets. Refer to the appropriate BMC Software and IBM utilities reference documentation for information about the authorizations required to use those utilities.

Authorization to Change Control Information

Control information for RECOVERY MANAGER is stored in an MVS data set, the **MRM\$OPTS** file. Your site's security package (for example, RACF [Resource Access Control Facility]) should give you **Read** access to that data set. With that authority, you can update the control parameter values for use by new RECOVERY MANAGER sessions. However, to save those changes back into the data set, you must also have **Alter** authority.

See "Appendix A, "RECOVERY MANAGER Control File," for a detailed description of the **MRM\$OPTS** file.

Authorization to Repository and RASCAT

The RECOVERY MANAGER repository and RASCAT are MVS VSAM (Virtual Storage Access Method) data sets. Your site's security package should give you **Read** access to those data sets. To save information in these data sets, you must also have **Alter** authority.

Authorization to Use Certain Batch Programs

Batch group revalidation and batch JCL generation require authorization as described in the following sections.

Authorization to Use Batch Group Revalidation

To use the Batch Group Revalidation feature of RECOVERY MANAGER, the MRMBGPV program must be APF authorized. The following conditions are also required:

- The creator of the group must be your user ID, one of your security group connections, or PUBLIC, or you must have **All** or **Open** authority. You must have **All** authority to replace the existing output data set member unless the creator is your ID or PUBLIC.
- You must have authority for any dependent groups that may be opened if you request reports for resources, data set recall, or pick lists.
- You must have **Open** authority on any utility options referenced by the group.

- For ABARS groups, you must have the authority to issue the DFSMSshm LIST command. You also need **Read** authority for the BCDS (backup control data set) and the aggregate's selection data set.
- For groups based on BMC Software's AR/CTL™ (APPLICATION RESTART CONTROL) utility, you need **Read** authority for the collector file.

See “Generating JCL for Batch Group Revalidation” on page 3-51 for more information.

Authorization to Use Batch SMF Analysis Program

To use the batch SMF (System Management Facilities) analysis feature of RECOVERY MANAGER, the MRMBSMF program must be APF authorized. The following conditions are also required:

- The creator of the group must be your user ID, one of your security group connections, or PUBLIC, or you must have **All** or **Open** authority. You must have type **All** authority to replace the existing output data set member unless the creator name authorizes you.
- If you are updating an existing group, you must also have **Open** authority on any utility options referenced by the group.
- You must have **Read** authority on the SMF input data set.

Authorization to Generate JCL

Before you can generate JCL, you must have authorization for the data set in which the JCL will reside.

To use the batch method of JCL creation, you must have **Execute** authority for RECOVERY MANAGER. Also, you must have **Open** or **All** authority to access the selected group or groups. See “Batch Recovery Job Generation” on page 5-19 for more information.

Authorization to Register Backups

When using MRMBREG, MRMDSSU, or MRMLREG to register backups in RASCAT, you need **Alter** authority for the RASCAT data sets.

Authorizations Needed by CRM Users

CRM users need specific authorizations when making requests to RECOVERY MANAGER for supported functions. The authorization required depends on the nature of the requested function. However, in order to use all supported RECOVERY MANAGER functions, the MVS server needs authority for all work it performs on the user's behalf. The MVS server checks the CRM user for group authority and for MVS data set authority. The MRM3@ATH module uses the SAF interface to determine data set authority for CRM users.

Note: The MRM3@ATH module must be replaced if the system is not SAF enabled. See "Customization of Authorizations" on page 2-17 for more information.

When run as a started task, the MVS server must have the ID added to the started procedures table in the RACF library.

For detailed information, see "Authorizations Needed by CRM Users" on page 7-3. Note that the program must be APF authorized.

Utility Authorizations

When you use RECOVERY MANAGER interactively or in non-CRM batch mode to generate JCL, RECOVERY MANAGER does not run any MVS utilities. In addition, *it does not verify the authority of a user to run the generated JCL.*

When you use RECOVERY MANAGER through CRM, you must be authorized to run the utilities coded in the generated backup or recovery JCL or otherwise be authorized to perform the requested operation. RECOVERY MANAGER checks data set authorizations for each backup or restore operation.

Refer to the following documents for information about the authorizations required to execute the utilities supported by RECOVERY MANAGER:

- Innovation Data Processing's *Fast Dump Restore (FDR) User Manual*
- For IBM's utilities, refer to the appropriate versions of the following documents:
 - Data Facility Data Set Services Reference (DFDSS)
 - MVS/ESA DFSMSHsm Storage Administration Guide (ABARS and HSM)

- MVS/ESA DFSMSHsm Storage Administration Reference (ABARS and HSM)
- MVS/DFP Access Method Services for Integrated Catalog Facility
- RAMAC SnapShot for MVS/ESA Implementing SnapShot
- For BMC Software’s utilities, refer to the appropriate versions of the following:
 - *RECOVERY UTILITY for VSAM User Guide*
 - *EXTENDED BUFFER MANAGER Reference Manual* (for information about SNAPSHOT COPY for VSAM [XBM™ with SCV™])
 - *COORDINATED RECOVERY MANAGER for MVS User Guide*
 - *APPLICATION RESTART CONTROL for VSAM Reference Manual*
 - *Backup and Recovery Products for DB2 and OS/390 Installation Guide*

Control Information for RECOVERY MANAGER

Control information for RECOVERY MANAGER is built by the install process and can be found in the control library in the MRM\$OPTS member. You can set up as many control information files as you need if a single file does not meet the requirements of your site.

You can browse RECOVERY MANAGER control information (MRM\$OPTS) by selecting **Control Information** on the Main Menu. You can also update that information when necessary if you have the authority to do so (see “Authorization to Change Control Information” on page 2-18). The control information includes the following items:

- BMC Software product information for those utilities available to RECOVERY MANAGER
- specifications for TSO (Time Sharing Option), system, and user step libraries
- MVS resource information (including job card specification)
- RMGR (RECOVERY MANAGER) information

Any changes you make to the control information are valid for new RECOVERY MANAGER sessions. To use the new information, you must save it, exit RECOVERY MANAGER, and then start a new session. See “Browsing or Updating Control Information” on page 2-25 to change or browse control information.

Warning! If you change RECOVERY MANAGER control information and the MRMXSTC started task is running, MRMXSTC does not pick up the new information unless you issue the **Refresh** command from CRM (see “Control Commands for the Server” on page 7-7) or stop and then restart the MRMXSTC task.

BMC Software Utility Product Information

You can display and update the load library name and version of the following BMC Software utility products if they have been installed by selecting the **Control Information** option on the Main Menu, then choosing to browse or update the **BMC Software product information** option.

- RECOVERY UTILITY for VSAM (RUV™) load library and version
- EXTENDED BUFFER MANAGER (XBM with SCV)
- APPLICATION RESTART CONTROL (AR/CTL)

This information is provided initially during RECOVERY MANAGER installation. If a new version of a BMC Software utility is installed later or one is installed for the first time, you must update the information manually. See “Utilities Supported by RECOVERY MANAGER” on page 2-26 for a list of all utilities supported by RECOVERY MANAGER.

TSO, System, and User Step Library Information

You can display and update the names for the following libraries and data sets used by RECOVERY MANAGER by selecting **Control Information** on the Main Menu, **Browse** or **Update**, then selecting the **TSO, system, and user step library specification** option:

- SMF data and extract file
- RAMAC load and CTRAN libraries
- ABARS control data set
- FDR load library and version
- ICFRU load library
- user step libraries one through three

The ABARS control data set is the name of the SMS source control data set (SCDS). It contains information about the ABARS group. The SCDS is the file updated whenever new ABARS aggregates are created using IBM's Interactive Storage Management Facility (ISMF).

You can enter additional step library names (for example, sort utility libraries) when you want RECOVERY MANAGER to use them. This information can be supplied during RECOVERY MANAGER installation.

MVS Resource Information

You can display and update the following MVS information used by RECOVERY MANAGER by selecting the **Control Information** option on the Main Menu, then **Browse** or **Update**, then the **MVS resource information** option:

- the name of the work unit to be used by RECOVERY MANAGER for temporary disk work space
- the percentage of the work data sets to be allocated as a primary extent, ranging from 10 to 100 percent.
- the names of three pseudovolumes used for migrated or archived data sets

Note: The pseudovolumes are used by the MRMBGPV batch revalidation program when generating data set recall reports. They are in addition to the MIGRAT and ARCIVE volume names. See “Batch Revalidation and Reporting” on page 3-47 for more information.

- the data set name into which output JCL is placed after batch generation
- a job statement of up to five lines

Note: These lines are used by default when you do not supply your own job statement when you request JCL generation by the MRMBGEN batch program. They are also used exclusively for CRM jobs. See “Online Help and Messages for RECOVERY MANAGER” on page 2-31 and “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36 for more information.

RECOVERY MANAGER System Information

You can display and update the following RECOVERY MANAGER system information by selecting the **Control information** option on the Main Menu, then **Browse** or **Update**, then **RMGR information**:

- the oldest version of RECOVERY MANAGER that will be used
- RASCAT VSAM cluster names
- repository VSAM cluster names
- up to four data set patterns identifying backups of RASCAT

Browsing or Updating Control Information

Summary: Use this procedure to browse or update the control information used by RECOVERY MANAGER. Alternatively, you can edit the MVS data set (MRM\$OPTS) that contains the control information. See Appendix A, “RECOVERY MANAGER Control File,” for more information.

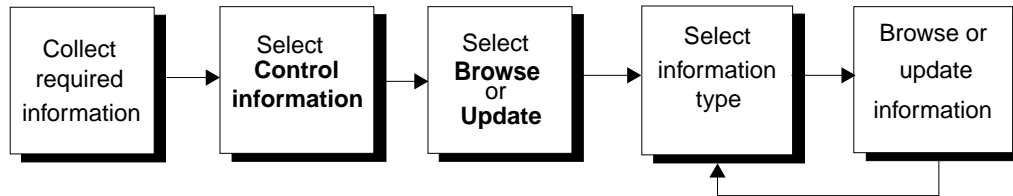


Figure 2-4 Displaying or Updating Control Information

Before You Begin

You need the following to update the control information:

- BMC Software utility products — initially entered by RECOVERY MANAGER during installation

You need to change this information only when you install a new release of RUV or SCV, or when you install one of those products for the first time.

- library information — initially entered by RECOVERY MANAGER during installation

Update this information when library information changes.

- MVS resource information — may need updating if you change or rename the pseudovolumes that identify your archived data sets
- RECOVERY MANAGER system information — initially entered during installation

Update this information when RASCAT backup names change or when you want to use a new repository or RASCAT.

- external data set authority for the control information data set

To Browse or Update Control Information

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **Control information**.
- Step 2** From the Control Information panel, select **Browse** to review the information for this system or select **Update** to change it, then press **Enter**.
- Step 3** Choose a control information option, then press Enter. Follow the instructions displayed on subsequent panels.
- Step 4** Press **F3** when you want to return to the Main Menu.

Note: If you updated any information, you must exit RECOVERY MANAGER and then start a new session to use the new information.

Warning! If you change control information for RECOVERY MANAGER and the MRMXSTC started task is running, MRMXSTC will not pick up the new information unless you issue the REFRESH command (see “REFRESH” on page 7-10) or stop and then restart the MRMXSTC task.

Utilities Supported by RECOVERY MANAGER

RECOVERY MANAGER uses IBM’s DFDSS as the default for backup and recovery utility. To use another utility, you must specify it when you update the utility options set used by your application group.

Utilities for Performing Backup Functions

RECOVERY MANAGER supports the following backup utilities:

- IBM’s DFDSS utility
- IBM’s ABARS function (ABACKUP command)
- IBM’s RAMAC SnapShot for MVS/ESA
- Innovation Data Processing’s FDR DSF
- IBM’s DFSMSHsm
- IBM’s IDCAMS REPRO
- BMC Software’s RUV
- BMC Software’s XBM with SCV

Utilities for Performing or Assisting in the Recovery Function

RECOVERY MANAGER supports the following recovery utilities:

- IBM's DFDSS utility
- BMC Software's RUV
- IBM's ABARS function (ARECOVER command)
- IBM's RAMAC SnapShot for MVS/ESA
- IBM's IDCAMS REPRO
- IBM's DFSMSHsm
- Innovation Data Processing's FDR DSF

System Resource Backup, Recovery, and Maintenance

You can use RECOVERY MANAGER to automate the backup, recovery, and maintenance of its system resources.

If you are authorized to access RECOVERY MANAGER, you can generate system resource backup, recovery, and maintenance JCL. However, you must also have authority to run the utilities invoked by the JCL (see "System Resource Authorization" on page 2-17).

All the system resource backup, recovery, and maintenance tasks are accessed through **System resources** on the Main Menu. They include the following:

- backup or recovery the RECOVERY MANAGER repository
- backup or recovery the RECOVERY MANAGER RASCAT
- synchronize the repository or RASCAT
- maintain ICF catalogs
- use ICFRU to recover ICF catalogs
- view system information

See Chapter 6, "Managing System Resources" for system resource backup, recovery, and maintenance procedures.

Application Group Backup and Recovery

You can use RECOVERY MANAGER to automate the backup and recovery of application data sets. The automatic processes use one or more IBM or BMC Software utilities (see “Utilities Supported by RECOVERY MANAGER” on page 2-26).

All RECOVERY MANAGER backup and recovery tasks are accessed through the **Application groups** and **Appl. group definition** selections on the Main Menu (see Figure 2-2 on page 2-9). With these options, you can build or add to an application group by selecting data sets using one of the following:

- data set name
- library scan (scanning JCL in one or more partitioned data sets)
- volume
- SMF data scan (scanning SMF data by job name)
- ABARS import (importing an ABARS aggregate)
- AR/CTL import (importing from the collector file)
- ICF catalogs (selecting data sets in the current ICF catalog structure)
- RUV import (importing from BMC Software’s RUV repository)
- existing RMGR groups (combining them into a new group)

If you are authorized to access RECOVERY MANAGER, you can generate backup or recovery JCL using one of the listed methods as a starting point. However, you must also have authority to run the IBM or BMC Software utilities invoked by the JCL to perform the backup or recovery (see “Utility Authorizations” on page 2-20).

For further information, see “Backup and Recovery Options for RECOVERY MANAGER” on page 2-29 and “Default Backup and Recovery Options” on page 2-31.

Backup and Recovery Options for RECOVERY MANAGER

In RECOVERY MANAGER for OS/390, utility options are specified in advance and saved as a named set, allowing multiple application groups to use the same set of utility options. Your organization can have multiple utility options sets for use with different application groups. RECOVERY MANAGER provides a set of default utility options. Additionally, utility options can be set up and defined as your organization's system-wide defaults.

The utility options (specified and saved in the named set) that you need to generate backup or recovery JCL are determined by your utility choices and your recovery strategy. The utility options are also affected by whether you specify backup and recovery options for system-wide use or for use by an application group. Because those options can be specified in different ways, RECOVERY MANAGER uses rules of precedence to select the appropriate option if conflicting instructions are provided during job preparation.

RECOVERY MANAGER provides an internal set of default utility options that are used whenever you choose not to provide a set of system-wide utility options and also do not select an options set at the application group level.

The rules (shown in Figure 2-5 on page 2-30) that determine which option specification is used for an object are as follows:

- When you select a named utility options set for an *application group*, the options in the set apply to *all* objects in the group. If you do not select an options set for the group, the group uses the system set of utility options. (Any single option within the set that is left blank at the group level will use the value assigned at the system level.)
- If you have chosen to create a utility options set for the *system* (always named \$\$\$\$BMC.DEFAULT_OPTIONS), the options in the set apply to all groups (unless you selected a different utility options set for the group). If you have not created a system-wide default set, RECOVERY MANAGER provides a set of *product* default options. (Any single option within the set that is left blank at the system level and at the group level uses the value assigned in the default set.)

Note: You can view the value *in effect* for a particular group (that is, with any overrides from levels with a higher precedence already applied) when you browse the group and select **Utility Options**. When you select **Update**, you see those values that have been specifically set at that level.

» Important Recommendation

As a general rule, you should set backup and recovery utility options at the system level and then override only those values that must be changed at the group level. Remember, changing options in an options set will affect all application groups using that set.

The rules of precedence used by RECOVERY MANAGER when conflicting values are specified in options sets are shown in Figure 2-5. For information about how to specify options, see “Working with Backup and Recovery Utility Options” on page 4-3.

Warning! One exception to this rule exists. A retention period set at the system-wide level always overrides an expiration date set at the group level. To avoid this situation, clear the retention period at the system level before running JCL.

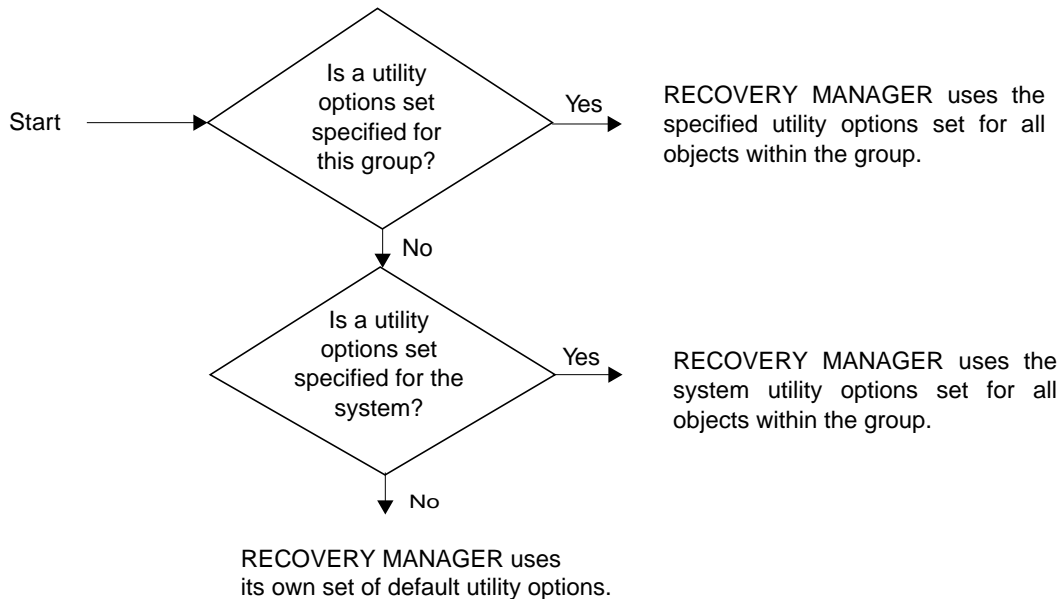


Figure 2-5 How Options Conflicts Are Resolved

Default Backup and Recovery Options

For utility options, RECOVERY MANAGER provides product default values that are used by RECOVERY MANAGER unless you define utility options sets for the system or group levels.

These product default options cannot be modified through the user interface, although they may be viewed in the set called `$$$$BMC.TEMPLATE_OPTIONS`. However, they are not optimal for all scenarios, and it is likely that you will want to specify some options at the system or group level to enhance backup or recovery job performance.

Online Help and Messages for RECOVERY MANAGER

RECOVERY MANAGER provides online help information as follows:

- a product overview that you access from the Main Menu
- help panels that provide assistance in using the current panel
- message help that provides additional information about messages you may receive while you are using RECOVERY MANAGER and that allows you to access the appropriate help panels

Note: RECOVERY MANAGER also issues appropriate messages when running batch jobs and when processing requests from CRM users. CRM users may receive messages as follows:

- messages in the range of 80200 through 81199 from RECOVERY MANAGER for OS/390 are described in Appendix B, “RECOVERY MANAGER Messages and Codes,” of this manual
- messages in the range of 76000 through 76999 from RECOVERY MANAGER for IMS are described in that product’s user guide
- messages in the range of 27000 through 27999 from CRM are described in that product’s user guide

The following sections provide more information about online help and messages.

Online Product Overview

To access the overview from the RECOVERY MANAGER Main Menu and view the RECOVERY MANAGER Main Help Menu, press **F1**.

To access the overview from any other panel, press **F1** to display panel-specific help, then press **F1** again to display the overview menu.

To return to the Main Menu at any time while in the overview, press **F3**.

In the Main Help Menu, you can choose the following topics:

- **Overview**—general information about RECOVERY MANAGER
- **Application groups**—general information about maintaining, backing up, or recovering groups
- **Application group definition**—general information about selecting objects for an application group
- **System resources**—general information about backing up or recovering system resources, synchronizing the RASCAT or repository, defining and maintaining ICF catalogs, and using the ICFRU functions.
- **Utility options**—general information about adding or editing utility options and viewing a list of groups that use each options set
- **Control Information**—general information about setting control information for RECOVERY MANAGER
- **BMC Subsystem Information**—general information about displaying and selecting BMC Software subsystem information for use with RUV
- **Glossary**—definitions for terms and acronyms used in the product
- **Quick Reference**—step-by-step instructions for performing some of the most common RECOVERY MANAGER procedures

To use the options on the Main Help Menu, proceed as follows:

- To select a topic, type **S** or **/** beside a topic and then press **Enter**.
- To continue to the next help panel, press **Enter** or **F8**.
- To return to the previous help panel, press **F7**.

Panel Help

To view help information for a RECOVERY MANAGER panel, press **F1** while the panel is displayed. Continue as follows in any topic help panel:

- To continue to the next help panel, press **Enter** or **F8**.
- To return to the previous help panel on a continuation help panel, press **F7**.
- To access the RECOVERY MANAGER product overview, press **F1** again from any help panel.
- To return to the RECOVERY MANAGER panel, press **F3**.

Messages and Message Help for RECOVERY MANAGER

RECOVERY MANAGER uses the following classes of messages:

- informational messages

These messages are for information only and require no action on your part. The long form of such messages has an **I** appended to the message number. For example, a `GROUP SAVED` message is issued when you successfully save a group to the repository.

- error messages

These messages are generated when RECOVERY MANAGER detects that you have provided incorrect input. The long form of such messages has an **E** appended to the message number. For example, the short message `INVALID ENTRY` is issued when you type an incorrect action code in the **Act** column on a Data Set List panel.

- warning messages

These messages are generated when a situation occurs that might have an unintended impact on your data. These messages have a **W** appended to the message number. For example, the message `NO MATCHES FOUND` is issued when no objects (data sets) can be found that match the given criteria.

RECOVERY MANAGER messages are available online and are found in member `MRMvrmm` of the `H*****.MSG` installation data set. They are also listed in Appendix B, “RECOVERY MANAGER Messages and Codes,” of this manual.

RECOVERY MANAGER returns messages in the following formats:

- A short, concise message may appear in the top-right corner of the panel in which the error occurred. To obtain further information, press **F1**. A numbered long form of the message having BMC as a prefix appears on line 3 of the current panel. Press **F1** again to display the Error Message Long Text panel, which provides a full explanation and any actions you should take.

When a short message is displayed, one of the following actions removes it:

- Press **F3** to return to the prior panel.
 - Press **F1** to access panel help.
 - If it is an informational message, continue processing.
 - If it is an error message, correct the error and continue.
- A numbered long form message having BMC as a prefix may appear on an Error Message Long Text panel. To display more information (explanation and user action), press **F1** again.
 - One or more numbered messages using the BMC prefix appear on an Error Message List panel after you press **Enter** to leave a task panel. To obtain an explanation and any user action, type **S** in the **Sel** (Select) column and then press **Enter**. The information appears on an Error Message Long Text panel.

To return to the previous panel, press **F3**. To access panel help, press **Enter**.

The BMC Software Customer Support toll-free telephone number is displayed on all message explanation panels. Call if you need further assistance.

Chapter 3 **Creating and Working with Groups**

This chapter discusses the grouping of data sets (objects) for backup and recovery. It includes the procedures for grouping those objects, saving and retrieving application groups, specifying group utility options, updating group authorizations, revalidating object availability, and generating batch group reports.

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When You Use the Procedures in This Chapter

Unless otherwise stated, start all the procedures provided in this chapter at the RECOVERY MANAGER Main Menu. If you are already in a RECOVERY MANAGER session, press **F3** until the Main Menu appears. Otherwise, use the method employed at your site to access the Main Menu.

While you are performing a procedure, you can access panel help by pressing **F1**. If you receive an error message, correct the problem before proceeding. For an explanation of a short message, press **F1** twice. For more information about a long message, follow the instructions on the panel to select that message.

Working with Objects and Groups

A RECOVERY MANAGER for OS/390 application group is simply a collection of data sets, paths, aliases, or other objects within an MVS (Multiple Virtual Storage) system, grouped for the purpose of performing a common action on them, such as backup or recovery. Grouping simplifies the specification of backup and recovery options because they can be specified just once for the entire group. Also, the backup or recovery JCL (Job Control Language) generated is for the entire group.

You can build and process groups interactively or, for recoveries, use batch programs. In some cases, batch programs have some online support.

» Important Recommendation

Build your groups before a backup or potential recovery and routinely update and revalidate them.

Using Interactive Methods

You can build a new group of data sets (objects) interactively in a number of ways. You can generate a data set list by specifying a data set name or pattern (that is, a name string containing wildcard characters). You can also start by specifying higher-level objects, such as volumes or library names. A group can also be identified by job name (SMF data), by ABARS (Aggregate Backup and Recovery Support) aggregate, as AR/CTL (APPLICATION RESTART CONTROL) files, by ICF (Integrated Catalog Facility) catalog, and by RUV™ (RECOVERY UTILITY for VSAM) import (if RUV is installed). A group can contain many objects or only one object.

During a group build, you can add or merge lists of objects, delete objects from the list either singly or by group, or completely replace a list of objects. You can validate that the data sets in the group have acceptable status, save the group in the RECOVERY MANAGER repository for later retrieval, and revalidate the group after retrieval. You can also add or revoke individual user authorizations to open and update the group.

You can specify backup and utility options at the system and group levels. If you do not specify an option and no value already exists, a default is used. Be aware of the following:

- When you choose to generate backup JCL for the group, any required defaults are almost entirely supplied by the backup utility you selected.
- When you choose to generate recovery JCL for the group, any required defaults are almost entirely supplied by RECOVERY MANAGER.

Using Batch Methods

In addition to the interactive method of using RECOVERY MANAGER, some tasks can be performed in batch mode. These are provided where the overall time to perform a recovery may be improved or there is some other significant advantage. You can use batch programs for routine contingency planning for MVS disaster recovery. In addition, using the batch method for routine work releases RECOVERY MANAGER for other purposes.

- Use the batch revalidation program MRMBGPV to report and optionally apply changes to the group population and to report on recoverability and related resources for the local site or for a recovery site. This program also calculates data set sizing information for recovery planning. Use it periodically to stay abreast of any changes and be better prepared for a recovery. See “Batch Revalidation and Reporting” on page 3-47.
- Use the MRMBGEN batch program for generating backup or recovery JCL for an application group. This feature provides these advantages compared with interactive backup and recovery JCL generation:
 - support for coordinated backups and recoveries
 - better automation for point-in-time application recovery
 - increased support for disaster recovery planning
 - reduced demands on TSO sessions by performing recovery analysis offline

See “Batch Recovery Job Generation” on page 5-19.

- Use the MRMBGPV batch program to create a group of all data sets on a volume before a failure occurs. See “Batch Revalidation and Reporting” on page 3-47 for more information.
- Use MRMBSMF to create or update a group based on SMF analysis. See “Working with SMF Data” on page 3-10 for more information.
- Use MRMBARC to create or update a group based on AR/CTL collector file import. See “Working with AR/CTL Imports” on page 3-13 for more information.

Defining Groups in RECOVERY MANAGER

You start to build a new group of MVS data sets by selecting **Appl. group definition** from the Main Menu. You can start the build in a number of ways depending on your situation or application. You can start by specifying one of the following:

- a data set name or wildcard pattern
- a library name or wildcard pattern for JCL scanning
- one or more MVS volume names
- job and system names or wildcards for SMF record analysis
- an ABARS aggregate name or wildcard pattern
- job and system names or wildcards for AR/CTL collector file import
- all catalogs connected to the current master catalog
- a data set name or wildcard pattern for RUV import

You can also build a new group from one or more existing groups (that is, groups already created and saved to the RECOVERY MANAGER repository). To use this method, start by selecting **Application groups** in the Main Menu.

Specifying Objects

To specify a group of objects (except job names, system names, or volumes), include one or more wildcards in the name string. To specify a single object or a volume, enter an explicit name for the object. When you specify a wildcard pattern to generate a list of objects, you can use additional wildcard patterns to add more objects to the list or replace the list entirely. Table 3-1 on page 3-6 lists wildcard characters that you can use with RECOVERY MANAGER.

Note: For cautionary information about using wildcards in the names of RECOVERY MANAGER groups in a coordinated recovery environment, see “Entering RECOVERY MANAGER Group Names” on page 7-7.

Table 3-1 Acceptable Wildcards

Wildcard Character	Result
% (percent)	matches any number of characters in an object name string. Not valid with RUV imports.
* (asterisk)	matches any number of characters in an object name string
_ (underscore)	matches a <i>single</i> character in an object name string. Not valid with RUV imports.
? (question mark)	matches a <i>single</i> character in an object name string

Group and utility option name strings can be delimited by double quotation marks. However, characters contained in a delimited identifier are not considered wildcard characters. When a name string consists of multiple part names, the parts are separated by a period. The following identifier types are used as parts in specifying name strings:

- 8-character creator IDs — can contain special characters when delimited
- 18-character group or utility options long IDs — can contain special characters when delimited
- 6-character MVS volume IDs — cannot contain special characters
- 44-character MVS data set names — cannot contain special characters

Specifying Objects by Data Set Name or Wildcard Pattern

If you know the names of the data sets that need to be backed up or recovered, this method may provide the fastest way to produce a list of those data sets. Specify this method by entering an MVS data set name, using wildcards if needed. When you use one or more wildcards in the name string, the result is a list of data sets. You can then manipulate the list to show only those you require. For example, `BMCMRM.V*` lists all data set names that start with `BMCMRM.V`.

Note: You cannot use wildcards in the high level qualifier.

For more information about building a group using data set names, see the procedure “To Build a New Group Using DSName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import” on page 3-21.

You can limit the data sets listed to only VSAM (Virtual Storage Access Method) clusters when processing a data set pattern. If a pattern results in more than 4,095 data sets, RECOVERY MANAGER issues a warning that the list is incomplete. Only the first 4,095 data sets are identified.

Specifying Objects by Library Data Set Name

When using this method, enter a complete or partial library data set name. You can use one or more wildcards to retrieve a list of libraries matching the pattern.

Note: You cannot use wildcards in the first qualifier.

You can scan for all DDs, or JOBLIB and STEPLIB only. RECOVERY MANAGER scans JCL in the libraries you select. The scanning code does not resolve symbolic variables within the JCL.

For more information about building a group using library data set names, see the procedure “To Build a New Group Using DSName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import” on page 3-21.

Specifying Objects by Volume

You can specify up to eight DASD volumes concurrently with this method by using the MVS volume IDs.

Note: You cannot use wildcards to specify a group by volume.

In foreground execution, RECOVERY MANAGER identifies the data sets on the selected volumes for which it has registered backups. Backups can be registered in RASCAT (Recovery Assets Catalog), the RUV repository, or ABARS.

In background execution, RECOVERY MANAGER identifies all the data sets contained on the specified volumes. Use this method for prefailure preparation only.

See “Working with Volumes” on page 3-9, “Saving, Retrieving, and Merging Groups” on page 3-25, and “To Build a Volume Group” on page 3-23 for more information about using volumes to build groups.

Specifying Objects by SMF Data Scan

When using this method in batch mode, enter the name of the group to be created, replaced, or updated.

Note: You cannot use wildcards in the **Group name** field.

Enter the SMF data set or SMF extract that you want to scan. The name must include all qualifiers and cannot include quote marks. Enter the job names and system names for which you want to scan. You can use wildcard patterns in these fields. You can also specify a time period over which to scan using the format YYYY-MM-DD HH:MM:SS, where the **End scan** date is equal to or later than the **Start scan** date. RECOVERY MANAGER presents those data sets that match your criteria and certain SMF record types.

When using this method online, RECOVERY MANAGER generates the MRMBSMF JCL and control cards.

See “Working with SMF Data” on page 3-10 and “To Build a New Group Using SMF or AR/CTL” on page 3-22 for more information about using SMF data to build groups.

Specifying Objects by ABARS Aggregate or Wildcard Pattern

If your site uses ABARS, RECOVERY MANAGER can associate its group with an ABARS aggregate and can read in the ABARS group definition. Specify this method by entering an ABARS aggregate name or pattern.

See “Working with ABARS Imports” on page 3-13 and “To Build a New Group Using DSNName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import” on page 3-21 for more information about using ABARS aggregates to build groups.

Specifying Objects by AR/CTL Import

Specify this method by entering a group name to be created, replaced, or updated.

Note: You cannot use wildcards in the **Group name** field.

Enter an AR/CTL collector data set to read. Enter one or more job names and MVS system names for which to scan. You can use wildcard patterns in these fields. Optionally, you can enter a date and time range within which to scan. The resulting initial list can be modified using the **Group action** options.

See “Working with AR/CTL Imports” on page 3-13 and “To Build a New Group Using SMF or AR/CTL” on page 3-22 for more information about using AR/CTL imports to build groups.

Specifying Objects by ICF Catalogs

Specify this method by selecting from a list of catalogs connected to the master catalog. RECOVERY MANAGER presents user catalogs from which you can select. Choose one or more catalogs to process.

See “To Build a New Group Using DSName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import” on page 3-21 for more information about using ICF catalogs to build groups.

Specifying Objects by RUV Import

Use this method to build a group of objects from VSAM clusters found in BMC Software’s RUV repository. Specify this method by entering a data set name. You can then replace or add to the data sets in the list. Enter a data set name or wildcard pattern, then select one or more data sets from the list to build the group.

See “Working with RUV Imports” on page 3-15 and “To Build a New Group Using DSName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import” on page 3-21 for more information about using RUV imports to build groups.

Working with Volumes

With RECOVERY MANAGER, you can create a group of objects that reside on a specified volume either before or after a volume failure (see “To Build a Volume Group” on page 3-23). RECOVERY MANAGER also provides support for volume group creation from CRM (COORDINATED RECOVERY MANAGER). See the next section “Building a Volume Group from CRM” on page 3-10.

Through the RECOVERY MANAGER user interface you can generate object groups based on DASD (Direct Access Storage Device) volume by specifying up to eight volsers (volume serial numbers). With foreground execution, RECOVERY MANAGER identifies the data sets on the volume for which it has registered backups in RASCAT, RUV repository, or ABARS. When a recovery becomes necessary, you can retrieve the saved group, revalidate it, and then submit the recovery JCL. However, with this method it is not necessary to build the group in advance.

Note: Volume groups created in batch mode can be revalidated only in batch, not online.

With background execution, RECOVERY MANAGER groups all data sets contained on a volume. Use this function before a failure occurs, then make a backup of the group to be used should a recovery become necessary.

Building a Volume Group from CRM

RECOVERY MANAGER provides the support necessary for a CRM user to create a volume group. *You cannot use wildcards with this option.*

A CRM user with all the required CRM and RECOVERY MANAGER authorizations can specify the name of one or more volumes to RECOVERY MANAGER for processing. RECOVERY MANAGER provides a name for the group in the form `<userid>.V<volser>yyyydddhhmm` and returns the information to CRM.

RECOVERY MANAGER stores the group in its own repository from which it can be retrieved by either CRM (with a group list request) or by a RECOVERY MANAGER user.

See “Creating a Volume Group” on page 7-16 for further information about creating volume groups from CRM.

Working with SMF Data

RECOVERY MANAGER uses the program MRMBSMF to analyze SMF data. Your site can run this program against your standard SMF record files. Some sites keep SMF records on a disk data set for some period of time. You can schedule MRMBSMF to coincide with the population and off-loading of current SMF data. You can use RECOVERY MANAGER to generate JCL online to run MRMBSMF.

RECOVERY MANAGER uses MRMBSMF to identify data sets used by one or more jobs. You can use the SMF data scan method to create and save a new group of objects or update or replace an existing group. Any identified job names and system names are stored as part of the group definition.

MRMBSMF uses the following record types for analysis:

14, 15, 17, 18, 60, 61, 62, 63, 65, 66, 67, 68. If you plan to build groups using SMF data, ensure that you are collecting these record types.

To generate JCL to run MRMBSMF, select **Appl. Group Definition** on the Main Menu, and then select **SMF Data Scan**. **Group name** is a required field. Enter a group name in the format *creator.group*. Wildcards are not allowed in this field. RECOVERY MANAGER allows up to 4096 groups in the control card for MRMBSMF.

You must select one of the three group actions:

- **Create** builds a new group containing the identified data sets and adds it to the repository.
- **Replace** indicates that the group exists in the repository and that those data sets should be replaced by the data sets identified in the current execution of MRMBSMF.
- **Update** adds the identified data sets to a group already existing in the repository.

The first time you use the panel, RECOVERY MANAGER displays the SMF data set name identified in the control information, which was obtained during the installation process. You can enter another SMF data set to be scanned. The data set name is stored in your ISPF (Interactive System Productivity Facility) profile and will be displayed the next time you use this panel. The information in the control information panel is not altered.

RECOVERY MANAGER uses the program MRMBSMX to extract SMF records. It then stores the records in an extract file. The online panel displays the SMF extract file name identified in the Control Information, but you can enter another name. You can use the extract file as input to MRMBSMF. You can choose to use the extract and also whether to run the extract before creating the group.

Note: The control library includes sample JCL to define the extract file. You have the option to create an extract file during installation. Should this extract file run out of space, the control file (.CNTL) contains sample JCL (MRMSMFX) you can use to allocate a new SMF extract data set.

» Important Recommendation

BMC Software strongly recommends that you use an extract file for running MRMBSMF to avoid contention with the system.

Job name is a required field. Use it to limit the SMF records to those matching the job names you specify. The job names can contain up to eight characters, and you can use wildcard characters in this field. You can specify additional job names in the generated control cards up to a maximum of 4096.

System name is optional. Use it to limit the SMF records to those MVS systems matching the system IDs that you specify. The system name is limited to four characters, and you can use wildcard characters in this field. You can specify additional system names in the generated control cards up to a maximum of 32.

Start scan is an optional field. Enter a date in the format YYYY - MM - DD HH : MM to limit SMF records to those with a time stamp greater than or equal to your entry.

End scan is an optional field. Enter a date in the format YYYY - MM - DD HH: MM to limit SMF records to those with a time stamp less than or equal to your entry. If you enter a date in this field, you must also enter a date in the **Start scan** field that is earlier or equal to the **End scan** date.

Note: Be aware of the following information:

- RECOVERY MANAGER ignores data sets marked as temporary in the SMF record.
- For generation data group (GDG) data sets, the base is included as part of the group, but not the explicit generations. You can add explicit generations online via the DSName level method. RECOVERY MANAGER writes a message to MRMPRINT indicating the number of generations of the base used by the jobs.
- Data sets that are allocated to the jobs but have not been opened for the first time are not included in the group. A message indicating this condition is issued. You can add the data sets to the group using the DSName level method.

Working with ABARS Imports

An ABARS aggregate group is an SMS class that defines control information and identifies the data sets to be backed up by a specific aggregate backup. RECOVERY MANAGER can build a group by importing an aggregate group from the ABARS control data set. RECOVERY MANAGER can generate the ABACKUP and ARECOVER JCL to back up or recover these data sets.

Note: When importing ABARS groups, you must run RECOVERY MANAGER on a system with DFSMSHsm installed.

When creating, validating, and generating JCL for an ABARS group, you must run RECOVERY MANAGER on an MVS system that is running SMS.

Before you begin, update the RECOVERY MANAGER ABARS control data set control option with the SMS source control data set (SCDS) name. RECOVERY MANAGER uses the SCDS to read the ABARS group definitions.

Working with AR/CTL Imports

BMC Software's APPLICATION RESTART CONTROL (AR/CTL) product can optionally track the data sets used by batch jobs and store the information in its collector data set. RECOVERY MANAGER can access this information to build a group of data sets used by the batch jobs.

RECOVERY MANAGER uses the program MRMBARC to analyze the AR/CTL collector file. You can run the program to build, replace, or update groups as often as necessary. MRMBARC locates the data sets identified in the collector file for the systems and job names specified. The job names and system names are stored as part of the group definition.

To generate JCL to run MRMBARC, select **Appl. group definition** from the Main Menu, then select the **AR/CTL Import** option from the Object Selection panel.

Group name is a required field. Enter a group name in the format *creator.group*. Wildcards are not allowed in this field. RECOVERY MANAGER allows up to 4096 groups in the control card.

You must select one of the following group actions:

- **Create** builds a new group containing the identified data sets and adds it to the repository. You can perform this action in batch or online.

Note: Be aware that the online process can be lengthy.

- **Replace** indicates that the group exists in the repository, and that those data sets should be replaced by the data sets identified in the current execution of MRMBARC. You can perform this action in batch or online.

Note: Be aware that the online process can be lengthy.

- **Update** adds the identified data sets to a group already existing in the repository. This action can be performed in batch mode only.
- **Simulate Create** is the same as **Create**, except that the group or groups are not saved in the repository and a list of the data sets selected for the group is printed. This action can be performed in batch mode only.

Enter the name of the AR/CTL collector data set that you want to read.

Job name is a required field. Use it to limit the AR/CTL records to those matching the job names you specify. The job names can contain up to eight characters, and you can use wildcard characters in this field.

System name is optional. Use it to limit the AR/CTL records to those MVS systems matching the system IDs that you specify. The system name is limited to four characters, and you can use wildcard characters in this field.

Start scan is an optional field. Enter a date in the format YYYY - MM - DD HH: MM to limit AR/CTL records to those with a time stamp greater than or equal to your entry.

End scan is an optional field. Enter a date in the format YYYY - MM - DD HH: MM to limit AR/CTL records to those with a time stamp less than or equal to your entry. If you enter a date in this field, you must also enter a date in the **Start scan** field that is earlier or equal to the **End scan** date.

Working with RUV Imports

When RUV is installed, RECOVERY MANAGER can build a group by importing data sets from the RUV repository. The RUV repository contains the VSAM data sets for which RUV has backups and archives. These data sets can be restored or recovered by the RUV utility.

Note: Before you begin, the module RUVZAPI provided by the RUV product must be accessible to RECOVERY MANAGER in the JOBLIB, STEPLIB, or link list. Otherwise, RECOVERY MANAGER cannot make requests to access the RUV repository.

Specify a BMC subsystem in the **BMC Subsystem name for RUV** field on the Main Menu panel. This selection makes the RUV repository known to RECOVERY MANAGER. RECOVERY MANAGER verifies that the subsystem is active. To select from a list of the BMC subsystems, select **BMC subsystems** from the Main Menu, then select an active subsystem from the list.

Note: If you do not have RUV installed, the **BMC subsystems** option does not appear on the Main Menu.

To build a group by importing from RUV, select **Appl. group definition** from the Main Menu, and then select **RUV Import** from the Object Selection panel. You can then enter a data set name or pattern. From the RUV repository, RECOVERY MANAGER retrieves a list of data sets that match your entry. You can continue to add more data sets to the list, replace the list, or select one or more data sets for inclusion in the group. After you select data sets, processing continues to the Data Set List panel.

Note: You must enter either a fully qualified data set name or use a wildcard (* or ?) in a pattern. If you enter only the first node, or even the first and second nodes of a data set name without a wildcard, RUV considers your entry a fully qualified data set name. Therefore, it will not produce a list of data set names beginning with that node.

Processing Groups and Data Sets

The following tables list all options and actions that you can perform on groups or data sets.

Group Options

Table 3-2 lists all options that you can perform on groups. Use it as a reference when you need more information about the options listed on a panel. The options displayed depend on the panel. All options do not appear on every panel.

Table 3-2 Group Options

Group Option	Description
Add	adds application groups to the list of groups being processed
Add objects to group	opens the Object Selection panel where you can select objects to add to the group
Delete	removes selected data sets from the existing group
Generate backup JCL	generates backup JCL online for the group
Gen recover JCL background	generates recovery JCL in background mode for the group
Group edit	opens the Group Edit panel, where you can choose from the following group options: Utility options, Authorizations, Revalidation, Definition display, Batch report.
Recovery type	displays available recovery types for the selected group
Replace	replaces the data sets in the group with new data sets

Group Actions

Table 3-3 lists all actions that you can perform on application groups. The actions available depend on the panel. All actions are not available on all panels. Type an action code listed on the panel in the **Act (Action)** column beside an application group to perform that action.

Table 3-3 Group Action Codes

Group Action Code	Description
/=Select	specifies a group for further processing
D=Delete	deletes a group from the list
S=Select	specifies a group for further processing
SA=Select all	specifies all groups in the list for further processing
J=JCL gen	opens the Batch Group JCL Generation Options panel, where you can generate JCL that, when run, generates recovery JCL for the selected group
JA=JCL gen all	opens the Batch Group JCL Generation Options panel, where you can generate JCL that, when run, generates recovery JCL for all of the groups
R=Report	opens the Batch Group Report Options panel, where you can request reports for the selected group
RA=Report all	opens the Batch Group Report Options panel, where you can request reports for all of the groups

Data Set Actions

Table 3-4 describes the actions you can perform on a data set. The actions available depend on the panel. All actions are not available on all panels. Type an action code listed on the panel in the **Act** (Action) column beside a data set to perform that action.

Table 3-4 Data Set Action Codes

Data Set Action Code	Description
D=Backup detail	displays more detail on the recovery point for the data set
G=Groups referencing	displays all groups that reference a selected data set
I=Group Information	(for ABARS only) displays a panel showing information about the selected ABARS aggregate
L=Backup List	displays a list of backups and archives for the data set From the list, you can select a different backup for the recovery point.
S=Select /=Select SS=Select Block SA=Select All	specifies data sets for further processing
T=LISTCAT	performs an IDCAMS LISTCAT for the data set and displays the results Use it to view the current attributes of the data set.
X=Exclude XX=Exclude Block	specifies objects that you do not want to process further
X=Exclude Recovery Point	specifies a data set that you want to exclude from the recovery point

Gathering the Data Required for Group Creation

Assuming that you know the data sets for which you want to generate backup and recovery JCL, very little preparation is required for you to build a new group. If you are using RUV, you must also know the subsystem to use and you must make sure that the subsystem is active.

In general, you should review the following information:

- authorizations required to perform the desired task
- RECOVERY MANAGER control information:
 - BMC Software product information
 - TSO, system, and step library specification
 - MVS resource information including job card specification
 - RECOVERY MANAGER information

For a preview of the specific information you may need to provide while running a RECOVERY MANAGER task, read the “Before You Begin” section that precedes each procedure in this user guide.

Building a New Group

Summary: Use this procedure to build a new group of data sets for backup or recovery. To start the build, select a method for object list generation, optionally edit the list, and then select and list those data sets that are candidates for the backup or recovery.

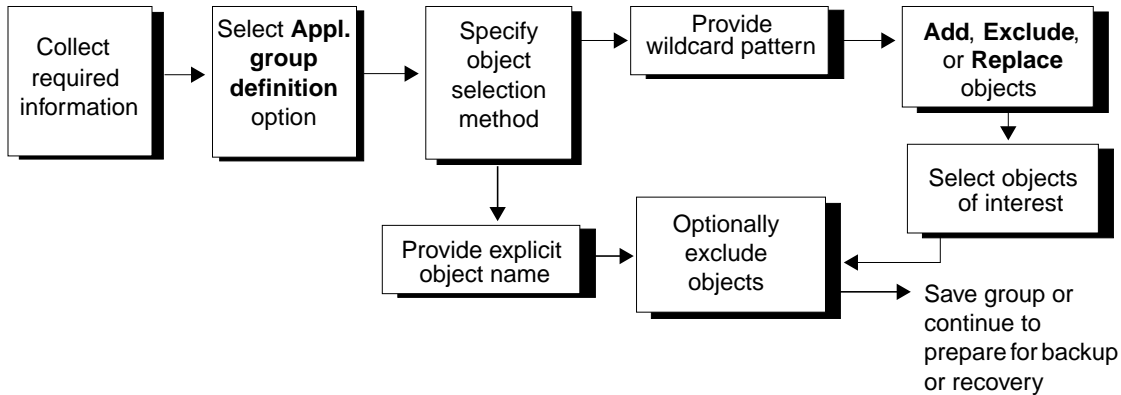


Figure 3-1 Building a New Group of Objects

Before You Begin

To perform this procedure, you must know which object selection method you will use as a starting point to build the new group. In addition, you must have the following authorizations:

- **Read** on control information
- **Read** on the repository if you do not plan to save the group
- **Alter** on the repository if you plan to save the group

- The following authorizations, depending on the object selection method you use to build the group:
 - Library scan—**Read** on the libraries to be scanned
 - ABARS—**Read** on the backup control data set (BCDS) and selection list data sets for any aggregates accessed
 - SMF—**Read** on the SMF input file and **Alter** on the extract file if you are extracting
 - Volume—**Read** on RASCAT
 - AR/CTL—**Read** on the collector file

To Build a New Group Using DSName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import

Use this method to build groups using all methods *except volume, SMF, and AR/CTL*. Start this procedure at the Main Menu.

Note: If you are building a new group using SMF or AR/CTL, see “To Build a New Group Using SMF or AR/CTL” on page 3-22. If you are building a volume group, see “To Build a Volume Group” on page 3-23.

Step 1 Select **Appl. group definition**.

The Object Selection panel appears.

Step 2 Choose the object selection method that you want to use as a starting point to create the new group, then press **Enter**.

The Object List Generation panel (or ABARS Aggregate Group panel if you are using ABARS) appears.

Step 3 Type the name of a data set or a wildcard pattern, then press **Enter**.

Note: You must enter either a fully qualified data set name or use a wildcard (* or ?) in a pattern. If you enter only the first node, or even the first and second nodes of a data set name without a wildcard, RUV considers your entry a fully qualified data set name. Therefore, it will not produce a list of data set names beginning with that node.

RECOVERY MANAGER displays data sets that match your selection criteria. You can select or exclude data sets for further processing. See “Processing Groups and Data Sets” on page 3-16 and “Saving, Retrieving, and Merging Groups” on page 3-25 for details on the options.

- Step 4** Choose one of the disposition options to continue processing the data sets, then press **Enter**.
- Step 5** Press **F3** to exit or to save the group to the repository for later processing. The Group Save Confirmation panel appears. Follow the instructions on the panel, then select **Save**, **SaveAs**, **Exit**, or **Cancel** as required.

Note: If you save the group with a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters. The *creator* term can be PUBLIC or your TSO user ID.

You can also choose to:

- add objects to the group (except when using ABARS)—see page 3-30
- change group options—see page 4-41
- update group authorizations—see page 3-36
- continue with backup or recovery preparations—see page 5-12 or page 5-15

To Build a New Group Using SMF or AR/CTL

Use this method to build groups using SMF or AR/CTL data. Start this procedure at the Main Menu.

Note: If you are building a new group using another method (except volume), see “To Build a New Group Using DSName Level, Library Scan, ABARS, ICF Catalogs, or RUV Import” on page 3-21. If you are building a group using volume, see “To Build a Volume Group” on page 3-23. For information about the options and actions you can perform, see “Processing Groups and Data Sets” on page 3-16 and “Saving, Retrieving, and Merging Groups” on page 3-25.

- Step 1** Select **Appl. group definition**, then press **Enter**. The Object Selection panel appears.
- Step 2** Select the object type you want to use as a starting point to create the new group, either **SMF Data Scan** or **AR/CTL Import**, then press **Enter**.

The Object List Generation panel appears.

- Step 3** Follow the instructions displayed on the Object List Generation panel, then press **Enter** to continue processing. The JCL Specification panel appears.

» **Important Recommendation**

When building a group using SMF, BMC Software strongly recommends using an extract file for running MRMBSMF to avoid contention with the system.

- Step 4** Enter the information requested on the JCL Specification panel to complete the process, then press **Enter**.

To Build a Volume Group

Use foreground execution to create a group containing all data sets from a volume for which a backup exists. Use background execution to build a new group of all data sets on a volume before a failure occurs. You can then create backups by volume. Begin this procedure from the Main Menu.

- Step 1** Select **Appl. group definition**, then press **Enter**.

The Object Selection panel appears.

- Step 2** Select **Volume**, then press **Enter**.

The DASD Volume Selection for Object List Generation panel appears.

- Step 3** Enter one to eight DASD volume names in the **volser** fields.

- Step 4** Select the execution type you want to use, either **Foreground** or **Background**.

Use foreground to create a group of all data sets on a volume for which a registered backup exists. Use background to create a group of all data sets on a volume before a volume failure occurs. You can then make a backup of the group.

Step 5 If you are using *foreground* execution, continue with Step 6. If you are using *background* execution, perform the following:

1. Enter a name in the **Group name** field (required).
2. Enter a description of the group in the **Description** field (optional).
3. Make a selection in the **Replace** field (required):
 - Select **Yes** if you want to replace an existing group with the same name.
 - Select **No** if you do not want to replace an existing group.

Step 6 Press **Enter**.

If you selected foreground execution, RECOVERY MANAGER displays the known data sets. Proceed to Step 8.

If you selected background execution, the JCL Specification panel appears. Continue with Step 7.

Step 7 In the JCL Specification panel, follow the instructions on the panel, then press **Enter** to display the JCL.

Note: If you use a partitioned data set to save the JCL, it must be cataloged and you must provide a member name.

The job statement and other JCL used to prefix the JCL must contain a symbolic variable for the job number. For more information, see “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36.

If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Step 8 Press **F3** to save the JCL data set or submit the job as required.

Saving, Retrieving, and Merging Groups

You can save groups to the RECOVERY MANAGER repository for later retrieval and processing. When you save a group, all the changes you made to the group are also saved.

To save the current group from the Data Set List panel, press **F3**, then select a save option. You can choose whether to save under the current name (**Save**) or under a new name (**SaveAs**).

When you retrieve one or more groups from the repository, you can perform the following:

- From the Application Group List panel:
 - merge two or more groups into a single new group of objects by selecting all the target groups
- Note:** When you merge two or more groups into a new group, duplicate objects are eliminated. Authorizations, backup and recovery options, and so on, that exist for objects in the original groups are *not* preserved in the merged group. The new group definition includes the original groups. See “How RECOVERY MANAGER Handles Definitions When Validating Merged Groups” on page 3-34 for more information.
- add groups to the list
 - delete a group from the repository
 - generate JCL that generates recovery JCL in batch mode
 - request a batch revalidation report for one or more groups

You can also request a revalidation report from the Group Edit panel.

- From the Group Edit panel:
 - revalidate the current group to determine whether new objects should be included or existing objects deleted; optionally apply such changes
 - request a batch revalidation report for the group.

You can also request a revalidation report for one or more groups from the Application Group List panel.

- view the group population definition
- change the group backup and recovery options
- view or modify group authorizations
- From the Data Set List panel:
 - make changes to the group before proceeding to select a recovery point or generate JCL
 - add objects to the group

The procedure in “Retrieving and Processing Saved Groups” on page 3-27 provides instructions for combining groups and deleting a group from the repository. The procedure in “Adding Objects to a Group” on page 3-30 provides instructions for selecting and adding objects to the current group.

For more information about selecting a recovery point, validating and revalidating, and generating JCL, see Chapter 5, “Backing Up and Recovering Groups.”

Listing Groups for CRM Users

RECOVERY MANAGER provides the support necessary to honor requests from CRM to list RECOVERY MANAGER groups.

A CRM user with all the required CRM and RECOVERY MANAGER authorizations can specify a group name or pattern to RECOVERY MANAGER for processing. RECOVERY MANAGER processes the request using the list generation procedure and returns the list of groups in an appropriate form to CRM.

See “Listing RECOVERY MANAGER Groups” on page 7-19 for the required authorizations and other information. See “Entering RECOVERY MANAGER Group Names” on page 7-7 for cautionary information about naming conventions.

Retrieving and Processing Saved Groups

Summary: Use this procedure to retrieve one or more groups that have been saved to the RECOVERY MANAGER repository. You can list the group or groups that are candidates for retrieval, edit the list, and then select those data sets you want to prepare for recovery. You can optionally exclude individual data sets, merge two or more groups to form a new group, or replace an entire group. You can also delete groups from the repository, request a revalidation report, or request batch JCL to be used as input to batch recovery JCL generation.

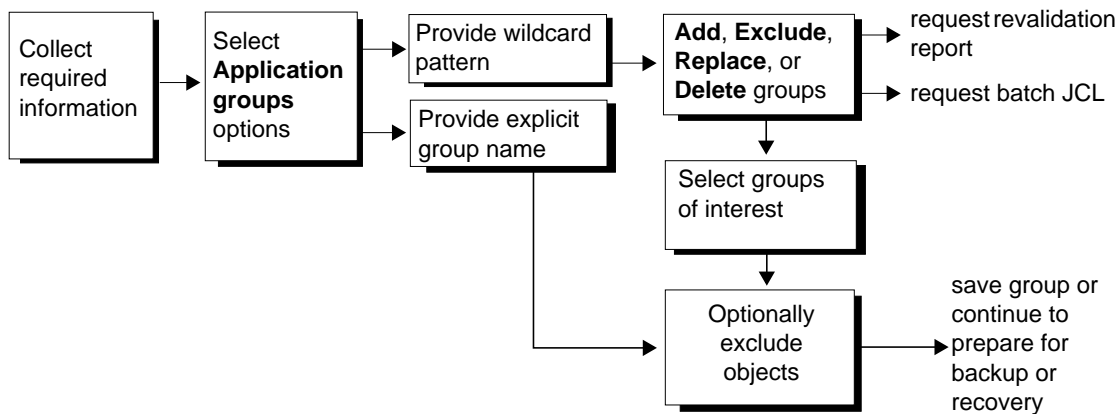


Figure 3-2 Retrieving and Processing Groups

Before You Begin

To perform this procedure, you need the following information:

- RUV subsystem if the RUV product is used
- site type information
- name of the group(s) you want to retrieve

You also need the following authorizations:

- if you are not the creator of the group:
 - **Open** if you do not plan to save changes to the group
 - **All** if you plan to save changes to the group
 - **Read** to the repository and control information

- to revalidate the group, the following additional authorizations, depending on the method selected to build the group:
 - Library scan—**Read** on the libraries to be scanned
 - SMF—**Read** on the SMF input file; **Alter** on the extract file if you are extracting
 - Volume—**Read** on RASCAT
 - AR/CTL—**Read** on the collector file

To Retrieve and Process One or More Saved Groups

Start this procedure at the Main Menu.

Step 1 Select **Application groups**, then perform the following:

1. Type the group name or wildcard pattern for the group.

Note: Group names delimited by double quotation marks (“”) are not considered for wildcard expansion. So, if you include one or more special characters in an explicit group name, you must delimit each part of the name with double quotation marks.

2. Set the RUV subsystem, if RUV is installed.
3. Select the site type.
4. Press **Enter** to display the Application Group List panel.

Step 2 In the Application Group List panel, if you typed the name of a *single group*, a list of the data sets in the group appears. Continue with Step 4.

If you typed a *wildcard pattern*, a list of groups appears. To make changes to the list, type the name or pattern for the groups you want to exclude from or merge with the list:

- Select **Replace** to replace the entire current list.
- Select **Add** to merge those groups and the current list.
- Select **Exclude** to remove those groups from the list.

Step 3 Type an action code in the **Act** (Action) column to process the groups. You can perform the following actions:

- Type **S** by each of the groups you want to continue processing, and then press **Enter**. A list of the data sets in the selected groups appears on the Application Group List panel.

Note: If you select only one group, that group is opened with all group information intact. If you select multiple groups, a new group is created that contains all objects from those groups and no group information is preserved.

- Type **D** by each group you want to delete *from the repository*, then press **Enter**. Confirm or cancel the deletion request in the panel displayed.

Note: This action deletes only the group, not the data sets within the group.

- Type **R** or **RA** by each group for which you require a revalidation report, then continue with “Group Revalidation and Reporting” on page 3-42.
- Type **J** or **JA** beside a group or groups for which you want to generate JCL, then continue with “Generating an MRMBGEN Job Interactively” on page 5-21.

Step 4 From the list of data sets in the group you can perform the following:

- exclude one or more data sets from further processing. Type **X** in the **Act** column by the object and then press **Enter**. Continue processing as necessary in the Data Set List panel.
- exit or save the group to the repository for later processing. Press **F3** to display the Group Save Confirmation panel. Follow the instructions on the panel and select **Save**, **SaveAs**, **Exit**, or **Cancel** as required.

Note: If you save the group under a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters.

You can also:

- change group options—see page 4-41
- revalidate the group—see page 3-42
- update group authorizations—see page 3-36
- continue with recovery preparations—see page 5-12

Adding Objects to a Group

Summary: Use these procedures to add objects to a group after it has been retrieved from the RECOVERY MANAGER repository. You can select those data sets you want to add to the group.

Note: You cannot add objects to a group containing an imported ABARS aggregate.

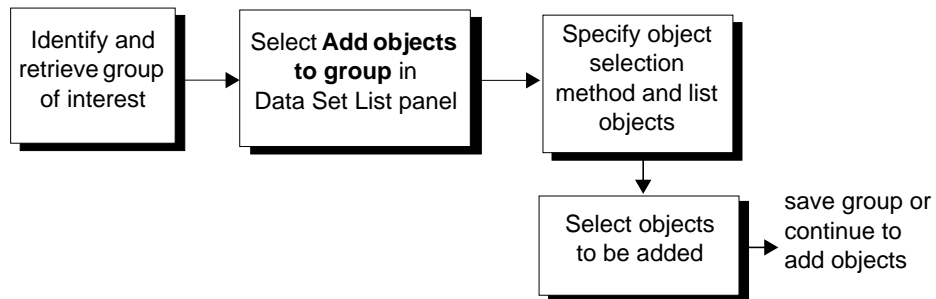


Figure 3-3 Adding Objects to a Group

Before You Begin

To perform this procedure you need the following:

- RUV subsystem, if applicable
- name of the group to which you want to add objects
- access to the group and the utility options set

You also need the following authorizations:

- **Read** on control information
- **Read** on the repository if you do not plan to save changes
- **Alter** on the repository if you plan to save changes to the group

- The following additional authorizations, depending on the method used to build the group:
 - Library scan—**Read** on the libraries to be scanned
 - SMF—**Read** on the SMF input file; **Alter** on the extract file if you are extracting
 - Volume—**Read** on RASCAT
 - AR/CTL—**Read** on the collector file

To Add Objects to a Group Using DSName Level, Library Scan, ICF Catalogs, or RUV Import

Using the online interface, you can add objects to groups created with these methods. Start this procedure at the Data Set List panel after retrieving a saved group. Follow the procedure “Retrieving and Processing Saved Groups” on page 3-27 to identify and retrieve the group to which you want to add objects.

Step 1 In the Data Set List panel for the target group, select **Add objects to group**, then press **Enter**. The Object Selection panel appears.

Note: **Volume, SMF Data Scan, ABARS Import, and AR/CTL Import** are not valid selections for this procedure.

Step 2 Choose an object selection method, then press **Enter**. The Selection for Object List Generation panel appears.

Step 3 Type the name of a data set or a wildcard pattern in the format shown on the panel, then press **Enter**.

Note: You must enter either a fully qualified data set name or use a wildcard (* or ?) in a pattern. If you enter only the first node, or even the first and second nodes of a data set name without a wildcard, RUV considers your entry a fully qualified data set name. Therefore, it will not produce a list of data set names beginning with that node.

Data sets matching your selection criteria are listed on the panel.

Step 4 Choose one of the actions to continue processing the data sets, then press **Enter**. See “Data Set Actions” on page 3-18 for an explanation of the codes.

Step 5 Press **F3** to exit or to save the group to the repository for later processing. The Group Save Confirmation panel appears. Follow the instructions on the panel, then select **Save**, **SaveAs**, **Exit**, or **Cancel** as required.

Note: If you save the group with a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters. The *creator* term can be PUBLIC.

To Add Objects to a Group Using SMF Data Scan or AR/CTL Import

You can add data sets using SMF analysis or AR/CTL import by updating groups built using one of those methods. This update process uses the batch programs MRMBSMF and MRMBARC. Start this procedure at the Main Menu.

Step 1 Select **Appl. Group Definition**, then press **Enter**. The Object Selection panel appears.

Step 2 Select **SMF Data Scan** or **AR/CTL Import** as the object selection method, then press **Enter**. The Object List Generation panel for your selected method appears.

Step 3 Follow the instructions on the Object List Generation panel to add objects to the group. Press **Enter** after completing all fields. The JCL Specification panel appears.

Note: **Job name(s)** is a required field.

Step 4 In the JCL Specification panel, follow the instructions on the panel, then press **Enter** to display the revalidation JCL.

Note: If you use a partitioned data set to save the JCL, it must be cataloged and you must provide a member name.

The job statement and other JCL used to prefix the JCL must contain a symbolic variable for the job number. For more information, see “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36.

If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Step 5 Press **F3** to save the JCL data set or submit the job as required. The results are valid for the point in time that the JCL executes.

Viewing Group Definitions

When you save a group, the list of objects in the group is stored in the RECOVERY MANAGER repository. When the group was created, the methods used to generate the saved object list (such as DSName Level) were tracked and stored in the repository as part of the group definition. When you revalidate the group, RECOVERY MANAGER can rebuild the object list based on the stored definition.

To view the definition for the current group, select **Definition Display** in the Group Edit panel, then press **Enter** to display the Group Definition Display panel. The **Description** field states how the group was initially created. The list can contain the definition types shown in Table 3-5.

Table 3-5 Group Definitions

Definition Type	Explanation
PATTERN	a data set name pattern
DSNAME	an explicit data set name
SMFSCAN	the job name and system name for SMF data scan
LIBSCAN	a data set name from the JCL scan
EXCLUDE	an excluded data set name
ICFCAT	the data set making up the ICF catalog structure
VOLUME	the data sets that were selected using the VOLUME (foreground) method
VOLGRP	the data sets that were selected using the VOLUME (background) method
ABARS	the ABARS aggregate group name
AR/CTL	the job name and system name for data sets registered in the AR/CTL collector data set
RUV IMPORT	the data set name registered in the RUV repository

RECOVERY MANAGER stores wildcard patterns for data sets, and for job name and system when you use SMF and AR/CTL only if you typed **SA** (Select All) on the Object List Generation panel when you started the build. Otherwise, individual data set names are stored. If a volume was specified, only its name is saved.

How RECOVERY MANAGER Handles Definitions When Validating Merged Groups

RECOVERY MANAGER allows a new group to be created from two or more other groups. To do so, select **Application groups** on the Main Menu and then make your group selections on the Group List panel. Doing so enables a type of hierarchical group structure. When such a group is created, only the objects are copied from the component groups—authorizations and definitions are not copied.

When such a group is revalidated, its current contents (objects) are compared to the current contents of its component groups—that is, the definitions of the source groups are not revalidated. To accomplish full revalidation of a hierarchical group structure, you must first revalidate at the lowest level, and then revalidate at the next higher level, and so on, applying any changes desired as you go.

Group Utility Options

RECOVERY MANAGER lets you select and create sets of backup and recovery options before you generate JCL to back up or recover a group. You can select and change options for the group as a whole.

When you select a set of options for the group and a value is set for a particular option, that value overrides the corresponding system value and is applied to all objects in the target group. If you do not provide option values by group, the system values are used in the backup or recovery JCL. If no value exists at the system level, product defaults are used. See “Application Group Backup and Recovery” on page 2-28 and Chapter 4, “Working with Utility Options,” for more information.

Option validity varies according to your choice of backup and recover utility. See “Choosing a Method for Job Generation” on page 5-3 and “Working with Backup and Recovery Utility Options” on page 4-3 for more information about validity. At the group level, you can perform the following:

- browse the existing option values (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)
- update existing values (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)
- delete the options connection from the group (see “Deleting a Utility Options Connection From a Group” on page 4-46)
- select a different set of utility options from the options list (see “Selecting a Utility Options Set” on page 4-44)

Make changes at the group level by selecting the **Group Edit** option in the Data Set List panel for the group. Recovery utility options are dependent upon the backup utility used for the group. The available utility options for backup and recovery are as follows:

- General utility options
- DFDSS specific backup options
- DFDSS specific restore options
- BMC RECOVERY UTILITY for VSAM specific options
- BMC XBM™ with SCV™ options
- ABARS specific backup options
- ABARS specific recovery options
- IBM RAMAC SnapShot for MVS/ESA options
- FDR specific backup options
- FDR specific restore options
- Output data set options

Group Authorizations

You can provide authorization to a new user to work with the current group through the Group Edit panel. You can also revoke a user authorization in the same way.

RECOVERY MANAGER provides the following types of authorization, which you can grant to users of the current working group:

- **A (All)**—provides a new user with the authority to open and save a group.
- **O (Open)**—provides a new user with the authority to open a group but does not allow the user to save changes to the group in the RECOVERY MANAGER repository. With **Open** authorization, a user can also generate JCL.

You can also grant PUBLIC authorization with either **Open** or **All** authority. This allows any user to perform the corresponding actions on a group. See “RECOVERY MANAGER Authorizations” on page 2-11 for more information about authorizations. Use the procedure “Changing Authorizations for Utility Options Sets” on page 3-36 to update group authorizations.

Changing Authorizations for Utility Options Sets

Summary: You can add, revoke, or change group user authorizations for the current (working) group by selecting the **Authorizations** option in the Group Edit panel.

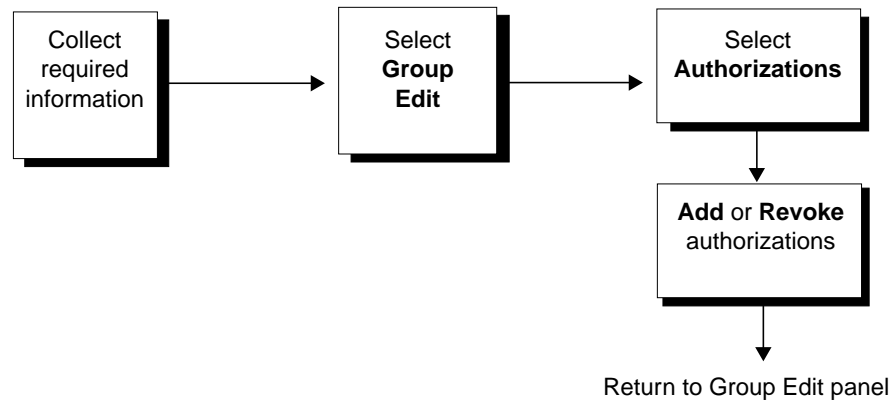


Figure 3-4 Updating Group Authorizations

Before You Begin

To perform this procedure, you need the following:

- **All** authority (if you are not the creator of the group)
- the following information that is specific to this task:
 - user ID that you will add to or delete from the existing list of authorized users. This ID can be PUBLIC.
 - type of authority (**All** or **Open**) that you will assign to the addition. If you do not make an assignment, the type defaults to **All**.

To Change Group Authorizations

Start this procedure at the Data Set List panel for the current group or at the Group Edit panel after completing one of these tasks:

- creating a new group interactively—page 3-20
- retrieving a group from the repository—page 3-29
- updating group options—see page 4-41

From the Data Set List panel, begin with Step 1. From the Group Edit panel, begin with Step 2.

Step 1 In the Data Set List panel, select **Group Edit**, and then press **Enter**.

Step 2 In the Group Edit panel, select **Authorizations**, and then press **Enter**.

Step 3 In the Group Authorization panel:

- To add a user, type the new user ID, select the **All** or **Open** authorization type, then press **Enter**. The ID is added to the list of authorizations.
- If you do not select **All** or **Open**, the authorization type defaults to **All**. Press **Enter** to display a list of users and their authorization type.
- To revoke an existing group authorization, type **R** in the **Act** column beside the ID that you want to revoke, then press **Enter**.
- To change the type of authorization for a user, first revoke the user, and then add that same user with the required type (**All** or **Open**).

Continue this process until all updates are complete.

Note: RECOVERY MANAGER does not allow duplicate user IDs.

Step 4 Press **F3** to return to the Group Edit panel. You can perform the following tasks:

- return to the Data Set List panel and continue with Step 5.
- change group utility options—see page 4-41
- revalidate the group interactively—see page 3-42
- view the group definition—see page 3-33
- request a batch report for the current group—see page 3-51

Step 5 In the Data Set List panel, press **F3** to display the Group Save Confirmation panel. Follow the instructions on the panel and select **Save**, **SaveAs**, **Exit**, or **Cancel** as required.

Note: If you save the group under a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters.

Object Validation

The RECOVERY MANAGER for OS/390 product performs object validation when you build an application group and prepare to generate backup or recovery JCL. The type of validation depends largely on the method you use to build the group and the type of processing you select. The generated JCL includes only objects with an acceptable status.

RECOVERY MANAGER performs the following types of validations on objects in a group:

- verifies that an object is defined in the ICF catalog
- verifies that an object is eligible for backup or recovery
- verifies that a suitable backup exists for the object
- verifies the data set type
- determines if the data set is archived

All object validation is performed in the context of building a group or revalidating a group regardless of whether the task is performed interactively or in batch mode. See “Group Revalidation and Reporting” on page 3-42 and “Generating JCL for Batch Group Revalidation” on page 3-51 for information about validating groups.

Verifying Object Definition in the ICF Catalog

Verifying the definition of an object in the ICF catalog detects renamed data sets or deleted data sets.

When the objects are specified by one or more wildcard patterns, verifying object definition is inherent in the pattern expansion process. Similarly, when a data set is named explicitly and the disposition is **Replace**, the name is verified on the Object List Generation panel.

Object definition in the ICF catalog is also verified whenever the group is revalidated. It is possible that an object that was defined initially when the group was built no longer exists. This situation is detected by the revalidation process.

Objects that are defined in the ICF catalog are initially listed on the Object List Generation panel with an OK status. Objects that are not defined are listed with a NDEF status and are excluded from the generated backup or recovery JCL. See “Responding to Unsatisfactory Object Status” on page 3-41 for actions you can take if the status is NDEF.

Verifying Eligibility for Backup or Recovery

RECOVERY MANAGER verifies that an object is eligible for inclusion in the generated backup or recovery JCL. Archived objects are not backed up. It also detects the object type. This information is used to determine which backup utility to use and depends on whether the object is a VSAM cluster.

RECOVERY MANAGER only backs up and recovers VSAM clusters (with sphere option), non-VSAM data sets, and ICF user catalogs. Many utilities automatically back up or recover the VSAM sphere when the cluster is backed up or recovered. VSAM data sets other than the cluster are displayed as part of the group for information purposes if they meet the selection criteria. They are included in sizing reports by MRMBGPV.

The verification is first performed when the object list is generated. If you use the group again, eligibility is verified again.

Verifying Object Recoverability

RECOVERY MANAGER verifies object recoverability by checking that a suitable backup exists as follows:

- When you select **Recovery type** in the Data Set List panel and select a recovery point in the Recovery Type Selection panel, RECOVERY MANAGER verifies the recoverability of each object for the selected recovery point. The results of this process are shown in the **Status** column when the Data Set List panel appears again.
 - An OK status indicates that the object is recoverable to the recovery point selected; such objects are included in the generated JCL.
 - Statuses other than OK indicate a recoverability problem and are not included in the JCL. Depending upon the type of problem, you can take alternate actions to recover the object. See “Responding to Unsatisfactory Object Status” on page 3-41 for more detailed information.
- You can also verify recoverability when you use the MRMBGPV (batch group revalidation) program by selecting (or coding) **Yes** for the Recoverability option. In this case RECOVERY MANAGER verifies recoverability to the current time; it cannot verify recoverability to a prior point. See “Batch Revalidation and Reporting” on page 3-47 for more information.

Responding to Unsatisfactory Object Status

Table 3-6 lists the various unsatisfactory object status types that RECOVERY MANAGER may return. It also provides corrective actions you can take.

Table 3-6 Object Status Types

Status	Included in Backup JCL	Included in Recover JCL	Explanation	User Response
NDEF	No	No	The data set is no longer defined in the ICF catalog.	The data set can be recovered but cannot be backed up.
ARCH	No	Yes	The data set has been archived and will not be included in the backup.	The data set can be recovered but cannot be backed up. If you wish to back it up, recall it.
NOCO	Yes	No	No copies were found for the data set in RASCAT, RUV repository, or ABARS.	This status is displayed only after a recovery point has been selected. Continue without that data set.
NOTA	Yes	No	The recovery point selected is not available. Enough backups may not be available.	This status is displayed only after a recovery point has been selected. Use L to list recovery points and select an alternative recovery point for the object, or specify a new recovery point for the entire group.
INFO	No	No	The data set matched the selection criteria, but will not be backed up or recovered.	No action.

Group Revalidation and Reporting

Using group revalidation, you can detect whether changes have occurred in the composition of the group since it was last saved to the repository. RECOVERY MANAGER reports any new objects that should be added to the group or any existing objects that should be deleted since it was last saved.

These changes are based on the group definition specified when the group was created or modified. For example, if the group definition included all data sets matching the pattern FINSYS.*, a new data set called FINSYS.ACCT (which was created since the last revalidation) should be added to the group. Likewise, a deleted data set called FINSYS.PYRL should be removed from the group.

» Important Recommendation

In general, when you are about to perform the backup or recovery of a group, always revalidate the group, make any necessary changes, and then generate and submit the JCL. JCL generated at an earlier time might be inaccurate.

You can revalidate a RECOVERY MANAGER group as follows:

- interactively through the Group Edit panel. See “Interactive Group Revalidation” on page 3-43.
- in batch mode using the MRMBGPV program. See “Batch Revalidation and Reporting” on page 3-47. RECOVERY MANAGER provides online support for this method.
- in batch mode using MRMBSMF and MRMBARC for SMF and AR/CTL groups respectively. See “Working with SMF Data” on page 3-10 and “Working with AR/CTL Imports” on page 3-13.
- in a coordinated backup and recovery environment from a CRM user interface. See “Group Revalidation for CRM Users” on page 3-55.

Interactive Group Revalidation

When you revalidate interactively through the Group Edit panel, you can revalidate the group content and optionally apply any required changes to the group.

With this method, RECOVERY MANAGER compares group composition with the current definition (see “Viewing Group Definitions” on page 3-33). If it finds differences, it reports them as a list of proposed deletions and additions to the group population. You can apply some or all of the proposed population changes to the current group automatically. However, you must save the group in order to update the repository with the applied changes. See “How RECOVERY MANAGER Handles Definitions When Validating Merged Groups” on page 3-34 when you are working with merged groups.

Note: For groups defined using SMF data or AR/CTL imports, revalidation will add only new data sets. It will not perform SMF or AR/CTL analysis and therefore cannot identify those data sets requiring removal.

To remove data sets no longer included within an AR/CTL collector file and include all current data sets within the collector file, replace the data sets at the group level. See “Working with AR/CTL Imports” on page 3-13 for more information.

To remove data sets no longer included within an SMF data scan and include all current data sets within the data scan, replace the data sets at the group level. See “Working with SMF Data” on page 3-10 for more information.

Volume recovery groups can only be revalidated in batch.

Revalidating the Current Group

Summary: You can detect whether any changes have been made to the current group by revalidating it from the Group Edit panel. You can optionally apply any changes detected.

Note: Volume groups can be revalidated only in batch, not online.

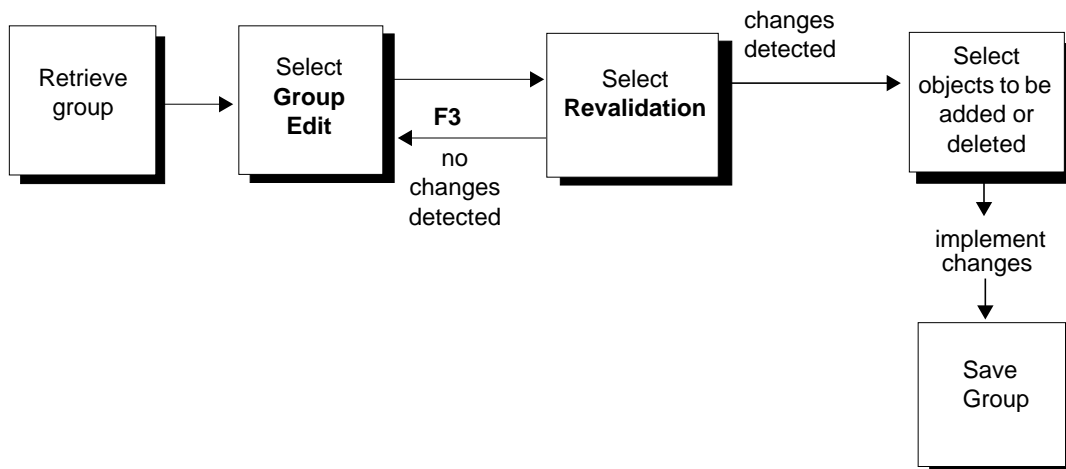


Figure 3-5 Revalidating a Group Interactively

Before You Begin

If you are not the creator of the group, you need these minimum authorizations to revalidate a group:

- **All** if you intend to save changes to the group
- **Open** if you do not intend to save changes to the group

- The following, depending on the method used to build the group:
 - Library scan—**Read** on the libraries to be scanned
 - ABARS—**Read** access on the ABARS aggregate group selection data sets and the authority to issue the DFSMSHsm LIST command
 - SMF—**Read** on the SMF input file; **Alter** on the extract file if you are extracting
 - Volume—**Read** on RASCAT
 - AR/CTL—**Read** on the collector file

To Revalidate the Current Group Interactively

Start this procedure at the Data Set List panel with the objects comprising the current group displayed. This panel is displayed after you have performed one of the following tasks:

- retrieved a saved group—page 3-29
- changed group options—page 4-41

Note: If the group was a volume recovery group created in batch, interactive group revalidation is not allowed. You must revalidate the group in batch using MRMBGPV. See “Batch Revalidation and Reporting” on page 3-47.

Step 1 In the Data Set List panel, select **Group Edit**, then press **Enter**.

Step 2 In the Group Edit panel, select **Revalidation**, then press **Enter**.

Note: If the group was created using SMF or AR/CTL data, a message indicates that only data sets detected as needing inclusion will be reported. It will not perform the SMF or AR/CTL analysis. It cannot, therefore, identify which data sets should be removed.

- If RECOVERY MANAGER detects changes to the group, the Group Revalidation panel appears. Continue with Step 3.
- If no changes are detected, the message NO DIFFERENCES FOUND appears on the Group Edit panel. Continue with Step 4.

Note: Revalidation detects only *changes* to the group. Revalidation does not report objects with unacceptable status if those objects were already included in the group.

Step 3 In the Group Revalidation panel, follow the instructions on the panel to select the objects that you want to delete from or add to the group, then press **Enter**. The Group Edit panel appears again.

Step 4 In the Group Edit panel, press **F3** to return to the Data Set List panel. If you applied all the changes in Step 3, all the objects listed have an OK status.

Step 5 From the Data Set List panel for the current group, you can:

- exclude selected objects from further processing. Type **X** in the **Act** column by the object, then press **Enter**.
- exit or save the group to the repository for later processing. Press **F3** to display the Group Save Confirmation panel. Follow the instructions on the panel and select **Save**, **SaveAs**, **Exit**, or **Cancel** as required.

Note: If you save the group under a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters.

You can also:

- change group options—page 4-41
- change group authorizations—page 3-36
- generate JCL—page 5-12 or page 5-15
- continue to prepare the group for backup or recovery—page 5-12 or page 5-15

Batch Revalidation and Reporting

When you revalidate in batch mode, RECOVERY MANAGER uses the MRMBGPV batch program to revalidate to the current time. The REPLACE YES option can be used to update the contents of the group based on changes in the population automatically. You can also revalidate multiple groups and optionally request the following detailed group-specific printed reports:

- group population revalidation
- object recoverability
- recovery resources required by the group
- tape volumes needed for recovery
- archived data sets required for recovery
- volumes used and storage needed for recovery

In addition, you can perform the following:

- specify whether the reports are for the local site or a recovery site
- update the objects in the group based on the group population report

Note: For groups defined using SMF data or AR/CTL imports, revalidation will add new data sets only. It will not perform SMF or AR/CTL analysis and therefore cannot identify those data sets requiring removal.

To remove data sets no longer included within an AR/CTL collector file and include all current data sets within the collector file, replace the data sets at the group level. See “Working with AR/CTL Imports” on page 3-13 for more information.

To remove data sets no longer included within an SMF data scan and include all current data sets within the data scan, replace the data sets at the group level. See “Working with SMF Data” on page 3-10 for more information.

Volume recovery groups can only be revalidated in batch.

When you use the batch method, you can routinely revalidate several groups concurrently or just one group. In either case, each group is revalidated to the point in time when the batch job executes.

MRMBGPV tries to access the RUV repository to look for backups if **BMC subsystem name for RU for VSAM** is set on the Main Menu, and the VRULOAD option in the control information is set. This causes the load of the RUVZAPI module.

If the group was created using the ABARS method, a step is generated ahead of MRMBGPV to get ABARS backups and route to the MRMABROT DD data set that is read by MRMBGPV.

For VSAM data sets, MRMBGPV only verifies recoverability of the cluster. Many backup utilities back up the sphere when the cluster is provided. If the group contains a VSAM cluster, its data and index components are temporarily added to the group for the purpose of sizing.

GDG bases are not verified for recoverability, but the last generation is temporarily added to the group and it is verified and sized.

You can generate printed batch group revalidation reports using the MRMBGPV program in the following ways:

- Use the **R** (report) or the **RA** (report all) option in the Group List panel when you want to generate JCL for the revalidation reports. **R** provides a report for the selected groups only. **RA** provides a report for all the groups listed on the panel.

To use this method, see “To Generate Batch Revalidation JCL for One or More Groups” on page 3-52.

- Select **Batch report** on the Group Edit panel to automatically generate the JCL for the revalidation reports. This method produces a report for the current group only.

To use this method, see “To Generate Batch Revalidation JCL for the Current Group” on page 3-54.

Batch Revalidation Option Descriptions

The batch revalidation program MRMBGPV provides you with the following reports and other options for the group or groups you specify.

Population

Similar to the population report provided by interactive revalidation, MRMBGPV can optionally report group population changes. The report is written to the data set defined by the MRMDELTA DD statement.

Replace

Use this option to tell RECOVERY MANAGER to automatically update the group when it finds population changes during revalidation. Alternatively, you can manually edit the object lists or perform revalidation online to view differences first.

Recovery Resources	<p>MRMBGPV optionally reports the resources needed for the recovery of a group. This includes backup data sets and RUV archive data sets. A major use of this report is as a checklist of data sets that must be taken offsite in preparation for disaster recovery. The SITETYPE option available with MRMBGPV allows you to choose whether the report is for the local site or the recovery site. The report is written to the data set defined by the MRMRESRC DD statement.</p>
Recoverability	<p>MRMBGPV optionally validates the recoverability of each object in the group to the current time. The SITETYPE option available with MRMBGPV lets you choose whether the report is for the local site or the recovery site. Use this option to verify offsite recoverability by identifying recoverability exceptions. Exceptions include data sets for which</p> <ul style="list-style-type: none">• no offsite backups have been created• backups exist but are not cataloged• no backup has been taken since the data set was last opened for update <p>Note: Data sets might show as exceptions if the backup utility is not resetting the change bit indicator in the VTOC.</p> <p>The report is written to the data set defined by the MRMXCEPT DD statement. See “Verifying Object Recoverability” on page 3-40 for more information.</p>
Tape Pick List	<p>MRMBGPV optionally produces a report of the tape volumes needed for recovery that enables tape operators to prepare the appropriate tapes prior to a recovery. The report is written to the data set defined by the MRMPICK DD statement.</p>
Data Set Recall List	<p>MRMBGPV optionally produces a report of the archived data sets needed for recovery. The report is written to the data set defined by the MRMRCALL DD statement.</p>
Sizing	<p>MRMBGPV optionally produces a report of the volumes used by the data sets in the group and the number of tracks used for each volume. The report is written to the MRMSIZE DD.</p> <p>If a VSAM cluster is included in a group, the DATA and INDEX components are temporarily added to the group. So, SIZING YES reports the volume and track requirements for the DATA and INDEX components, even if only the cluster is in the group. RECOVERY MANAGER reports on alternate VSAM indexes.</p> <p>Note: Disaster recovery planning is the primary use for this report. It shows sizing of currently defined and active data sets.</p>

Site type

Use this option to tell RECOVERY MANAGER whether to produce the selected reports for the local site or a recovery site. Utility options have a disaster recovery data set pattern. Backup and RUV archives matching the pattern are considered offsite (recovery site, not local).

Generating JCL for Batch Group Revalidation

Summary: You can automatically generate revalidation JCL for one or more selected groups from either the Group List panel (see “To Generate Batch Revalidation JCL for One or More Groups” on page 3-52) or from the Group Edit panel (see “To Generate Batch Revalidation JCL for the Current Group” on page 3-54).

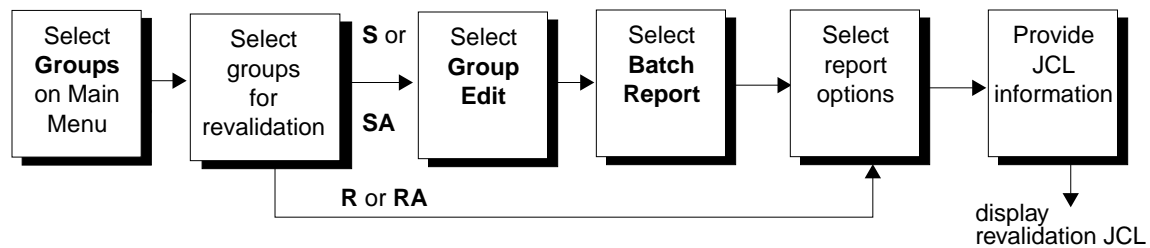


Figure 3-6 Generating JCL for Batch Group Revalidation

Before You Begin

If you are not the creator of the group, you need the following authorizations:

- **All** to save changes to the group
- **Open** if you do not intend to save changes

You also need the following authorizations:

- **Open** for any dependent groups that may be opened for population reports
- **Read** on control information data set, the repository, and RASCAT
- **Alter** on the repository data set if you use **Replace Yes**
- **Read** for the RUV repository, the ABARS control data set, and the AR/CTL collector file if you are using these options

To Generate Batch Revalidation JCL for One or More Groups

Start this procedure at the Main Menu.

Step 1 Select **Application groups**, then perform the following:

1. Type the RUV subsystem, if needed.
2. Select the site type for the group.
3. Press **Enter** to display the Group List panel.

Step 2 In the Group List panel, type a wildcard pattern or the name of a single group in the format *creator.name*. Select **Replace** in the **Group list disposition** field.

In the **Act** (action) column, type **R** (report) or **RA** (report all) to specify one or more groups for processing, then press **Enter**.

Note: The precedence for the available actions is as follows:

1. If **RA** is entered, all other entries are overridden.
2. If **SA** is entered but not **RA**, any other actions are overridden.
3. If neither **RA** nor **SA** is entered, any **S**, **R**, or **D** entries are processed in the order in which they are encountered.

Step 3 In the Batch Group Report Options panel, accept the defaults or make selections as follows:

1. Select **Yes** for each type of report required.
2. Select **No** for each type of report not required.
3. Select **Yes** in the **Replace** field to automatically update the group with changes.
4. Select the site type (**Local** or **Recovery**) for the report.
5. Press **Enter** to display the JCL Specification panel.

Note: Your selections apply to all selected groups.

Step 4 In the JCL Specification panel, follow the instructions on the panel, then press **Enter** to display the revalidation JCL.

Note: If you use a partitioned data set to save the JCL, it must be cataloged and you must provide a member name.

The job statement and other JCL used to prefix the JCL must contain a symbolic variable for the job number. For more information, see “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36.

If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Step 5 Press **Enter** to save the JCL data set or submit the job as required. The results are valid for the point in time that the JCL executes.

To Generate Batch Revalidation JCL for the Current Group

You can start this procedure at the Group Edit panel. If you are not already in the Group Edit panel, you can access it from the Data Set List panel, which is displayed after you have performed one of the following tasks:

- retrieved a saved group—page 3-29
- changed group options—page 4-41

Step 1 In the Data Set List panel for the group, select **Group Edit**, then press **Enter**.

Step 2 In the Group Edit panel, select **Batch report**, then press **Enter**.

Step 3 In the Batch Group Report Options panel, accept the defaults or:

1. Select **Yes** for each type of report required.
2. Select **No** for each type of report not required.
3. Respond **Yes** to **Replace** to automatically update the group with changes.
4. Select the site type (**Local** or **Recovery**) for the report.
5. Press **Enter** to display the JCL Specification panel.

Step 4 In the JCL Specification panel, follow the instructions displayed, then press **Enter** to display the revalidation JCL.

Note: If you use a partitioned data set to save the JCL, it must be cataloged and you must provide a member name.

The job statement and other JCL used to prefix the JCL must contain a symbolic variable for the job number. For more information, see “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36.

If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Step 5 Press **Enter** to save the JCL data set or submit the job as required. The reports are valid for the point in time that the JCL executes.

Group Revalidation for CRM Users

When you revalidate or request reports from RECOVERY MANAGER through a CRM user interface, RECOVERY MANAGER uses the MRMBGPV program described in “Batch Revalidation and Reporting” on page 3-47. This method allows revalidation to the current time only. Revalidation updates the group automatically if changes are detected in the group composition. You can request the following reports through CRM:

- group population revalidation
- object recoverability
- recovery resources required by the group

See “Revalidating and Reporting with CRM” on page 7-18 for more information. Figure 3-7 on page 3-56 and Figure 3-8 on page 3-58 show sample batch revalidation JCL and sample revalidation reports respectively.

Batch Revalidation Sample JCL

The sample JCL shown in Figure 3-7 was generated after making the following selections in the Batch Group Report Options panel:

Population: Yes
Replace: No
Recovery resources: No
Recoverability: Yes
Tape pick list: No
Data set recall list: No
Site type: Local
Sizing: No

The revalidation is to be performed for the two groups identified in the MRMIN control data set. The data sets used in the JCL are:

- MRMIN for the control statements
- MRMPRINT for output messages
- MRMOPTS for RECOVERY MANAGER control information (MRM\$OPTS)
- MRMMSGs for the RECOVERY MANAGER message file
- STEPLIB for the RECOVERY MANAGER and RUV load libraries
- MRMERROR for SAS run time errors
- MRMDELTA for the population report
- MRMXCEPT for the recoverability report
- MRMRESRC for the resources report
- MRMRCALL for the recall report
- MRMPICK for the pick list report
- MRMSIZE for the volume usage report

```

//CXSRPT JOB(PARM),JOB01,CLASS=A,MSGCLASS=X,
//NOTIFY=&SYSUID /*
=====
/* DOC: GENERATED BY RDARXS ON 1999/04/07 AT 12:32*/
*****
/* RECOVERY MANAGER - V1.2.00 - BMC SOFTWARE, INC. */
/*****
/* BATCH REVALIDATION REPORT *
/* FOR SELECTED GROUPS *
/*****//
//MRM000 EXEC PGM=MRMBGPV,REGION=4M,PARM='DDDD'
//STEPLIB DD DISP=SHR,DSN=BMCMRM.V120TEST.LOAD
// DD DISP=SHR,DSN=BMC RUV.SYS2.RUV11.LOAD
//MRMMSGS DD DISP=SHR,DSN=ELS.V153TEST.CNTL(MRMMSGS)
//MRMOPTS DD DISP=SHR,DSN=ELS.V153TEST.CNTL(MRM$OPTS)
//SYSOUT DD DUMMY
//MRMERROR DD SYSOUT=*
//BMCERROR DD SYSOUT=*
//MRMPRINT DD SYSOUT=*
//MRMDELTA DD SYSOUT=*
//MRMRESRC DD SYSOUT=*
//MRMXCEPT DD SYSOUT=*
//MRMPICK DD SYSOUT=*
//MRMRCALL DD SYSOUT=*
//MRMSIZE DD SYSOUT=*
//*MRMTRACE DD SYSOUT=*
//MRMIN DD *
REVALIDATE GROUP RDACXS."JCL";
/*

```

Figure 3-7 Sample Batch Revalidation JCL

Batch Revalidation Report Samples

Figure 3-8 shows a sample report for a local site using the Batch Group Report Options shown in Table 3-7.

Table 3-7 Batch Group Report Options

Field	Selection	Result
Population	1 (Yes)	Content Revalidation report
Replace	2 (No)	Does not replace an existing group
Recovery resources	1 (Yes)	Recovery Resources report
Recoverability	1 (Yes)	Recoverability Exceptions report
Tape pick list	1 (Yes)	Local Site VOLSER Pick List report
Data set recall list	1 (Yes)	Local Site Data Set Recall List report
Site type	1 (Local)	Reports are for the local site
Sizing	2 (No)	Does not produce volume usage report

* RECOVERY MANAGER FOR OS/390 V1.2.00 - AUDIT REPORTS - 1999/03/29 3:27:05*

```

===== CONTENT REVALIDATION =====
----- GROUP RDARXS.RPT_BGPV -----
DELETE RDAPXR.MRM120.CLIST
DELETE RDAPXR.MRM120.CNTL
DELETE RDAPXR.MRM120.INSTJCL
DELETE RDAPXR.MRM120.V100.RASCAT1
DELETE RDAPXR.MRM120.V100.REPO1

===== RECOVERY RESOURCES =====
----- LOCAL SITE - GROUP RDARXS.RPT_BGPV -----
TIMESTAMP          DEVTYPE          BACKUP DATA SET NAME
1999-02-17-12.10.09 3390          RDAPXR.LB990217.T095519
    
```

* RECOVERY MANAGER FOR OS/390 V1.2.00- AUDIT REPORTS - 1999/03/29 3:27:05 *

===== RECOVERABILITY EXCEPTIONS =====

----- LOCAL SITE - GROUP RDARXS.RPT_BGPV -----

NO ADEQUATE BACKUP REGISTERED FOR OBJECT(S) SINCE LAST OPENED FOR UPDATE

VOLSER	LAST REF	LAST BKUP	LAST UPD	DATA SET NAME
DEV218	1999.106	- NONE -	1999.076	RDAPXR.ACP540.SSIDINST.DBBAJCL
DEV224	1999.119	- NONE -	1999.076	RDAPXR.ARM311.SSID.TABLE
DEV208	1999.111	- NONE -	?????.???	RDAPXR.BMCARM.BSRRJCL.G0013V00
SYSB02	1999.119	1999.056	?????.???	RDAPXR.CLIST
DEV211	1999.119	- NONE -	1999.076	RDAPXR.DCI0499.INSTALL
WORK1K	1999.106	- NONE -	1999.076	RDAPXR.TMPISPF.D990415.T114301
DEV510	1999.112	- NONE -	1999.076	RDAPXR.V310INST.PLIB

MISSING RESOURCE(S) FROM MVS CATALOG

NONE

* RECOVERY MANAGER FOR OS/390 V1.2.00- AUDIT REPORTS - 1999/04/29 3:27:05 *

===== LOCAL SITE - VOLSER PICK LIST =====

441160

* RECOVERY MANAGER FOR OS/390 V1.2.00 - AUDIT REPORTS - 1999/03/20 7:10:56*

===== VOLUME USAGE =====

VOLSER	DEVTYPE	TRACKS USED
DEV59C	3390	1
DEV592	3390	1
DEV411	3390	2
DEV583	3390	1
DEV599	3390	1
DEV589	3390	1
DEV410	3390	1
DEV597	3390	1
DEV550	3390	1

* RECOVERY MANAGER FOR OS/390 V1.2.00- AUDIT REPORTS - 1999/04/29 3:27:05 *

===== LOCAL SITE - DATA SET RECALL LIST =====

RECALL AED3.ABARSNEW.LP980626.T134942.TASK02

Figure 3-8 Sample Batch Revalidation Reports

Chapter 4 Working with Utility Options

This chapter describes the utility options available at the group and system levels and the corresponding defaults.

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When You Use the Procedures in This Chapter

Unless otherwise stated, start all the interactive procedures provided in this chapter at the RECOVERY MANAGER Main Menu. If you are already in a RECOVERY MANAGER session, press **F3** until that menu appears. Otherwise, use the method normally employed at your site to access the Main Menu.

While you are performing a procedure, you can access panel help by pressing **F1**. If you receive an error message, correct the problem before proceeding. For an explanation of a short message, press **F1** twice. For more information about a long message, follow the instructions on the panel to select that message.

Working with Backup and Recovery Utility Options

In RECOVERY MANAGER for OS/390, utility options are specified in advance and saved as a named set, allowing multiple application groups to use the same set of utility options. RECOVERY MANAGER provides a set of default utility options. You can create a utility options set to be used as the system-wide defaults at your site. Your site can have multiple utility options sets for use with different application groups.

Note: Option availability varies according to your choice of utility and the version of that utility that you are using. The tables on pages 4-6 through 4-22 show which options can be selected at the system and group levels for each utility. The recovery options available depend on the utility used to back up the group.

RECOVERY MANAGER provides the following utility options panels:

- General Utility Options Specification panel—use this panel to select general backup options as follows:
 - Select one of the following utilities to back up non-VSAM data sets:
 - IBM's Data Facility Data Set Services (DFDSS)
 - IBM's Aggregate Backup and Recovery Support (ABARS)
 - IBM RAMAC SnapShot for MVS/ESA
 - Innovation Data Processing's Fast Dump Restore Data Set Function (FDR DSF)
 - IBM's DFSMSHsm utility
 - Select one of the following utilities to back up VSAM data sets:
 - DFDSS
 - ABARS
 - IBM's RAMAC SnapShot for MVS/ESA
 - FDR
 - IBM's DFSMSHsm utility
 - IDCAMS
 - BMC Software's RUV
 - BMC Software's XBM
 - Select the number of backup copies you want to make.
 - Enter a data set name to identify backups for off-site use.
 - Select the Recovery Assets Catalog (RASCAT) retention period and read limit.

For more information, see “General Utility Options” on page 4-6.

- DFDSS Backup Options Specification panel—Use this panel to set options that are used if you choose DFDSS as the backup utility. See “DFDSS Backup Options” on page 4-7 for more information.
- DFDSS Restore Options Specification panel—If you are using DFDSS as your restore utility, you may want to set specific DFDSS restore options. (DFDSS is used as the restore utility for data sets backed up using DFDSS.) See “DFDSS Restore Options” on page 4-9 for more information.
- BMC RUV Utility Options Specification panel—If you choose BMC Software’s RUV as your backup and recovery utility, you can set RUV-specific options. See “RUV Options” on page 4-14 for more information.
- XBM Utility Options Specification panel—XBM with SCV makes point-in-time copies of VSAM data sets. Use this panel to set options specifically for use with this product. See “XBM with SCV Options” on page 4-15 for more information.
- ABARS Backup Utility Options Specification panel—The ABARS utility is used to make backups of ABARS aggregates. Use this panel to set options specifically for use with this product. See “ABARS Backup Options” on page 4-17 for more information.
- ABARS Recover Utility Options Specification panel—The ABARS utility is used to recover ABARS aggregates. Use this panel to set options specifically for use with this product. See “ABARS Recovery Options” on page 4-19 for more information.
- IBM RAMAC SnapShot Copy Options Specification panel—This utility is used to make point-in-time copies of VSAM data sets. Use this panel to set options specifically for use with this product. See “RAMAC SnapShot for MVS/ESA Options” on page 4-22 for more information.
- FDR Backup Options Specification panel—Use this panel to set options that are used if you choose FDR as the backup utility. See “FDR Backup Options” on page 4-24 for more information.
- FDR Restore Options Specification panel—If you are using FDR as the backup utility, you can set restore options specific to this utility. See “FDR Restore Options” on page 4-28 for more information.

- Output Data Set Options Specification panel—Use the panel to specify output data set options. The parameters apply to all supported utilities. See “Output Data Set Options” on page 4-33 for more information.

For each utility options set, you can perform the following:

- browse the existing option values
- edit (update) existing values
- delete the entire set
- make a copy of the set with a new name
- obtain a list of application groups that reference the set
- add or revoke authorizations to the set

RECOVERY MANAGER uses default option values when you do not make a selection at the group or system level. If a selection is not made at a lower level, the value set at the next-higher level is used. For example, if a value is not selected at the group level, the system-level value is used.

After installing RECOVERY MANAGER, you can create a set of system-wide default utility options through **Utility Options** in the Main Menu. If you do not set option values at the group level, RECOVERY MANAGER uses the system default values when generating backup and recovery JCL.

If you select a value at the group level, that selection overrides the corresponding system value and is applied to all objects in the current group. See “Application Group Backup and Recovery” on page 2-28 for more information.

Make option selections at the group level through the **Group edit** option, which you can select in the Data Set List panel for the group. The options you can update are described in the following sections. You can select them on the Utility Options Specification panel.

Utility Option Descriptions

The Utility Options Specification panel lets you access utility options for the system or group level named on the panel. You can choose to set general options, set options specific to DFDSS, RUV, XBM with SCV, ABARS, and RAMAC SnapShot for MVS/ESA, and set output data set options.

General Utility Options

On the General Utility Options Specification panel, you can set utility options that apply to all supported utilities. Those options are listed in Table 4-1 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table.

Table 4-1 General Utility Options

General Utility Option	Default Value	See Page
Non-VSAM backup utility	1 (DFDSS)	4-6
VSAM backup utility	1 (DFDSS)	4-6
Number of copies	1	4-6
Offsite data set pattern	none	4-7
RASCAT retention period	0 (unlimited) (no default)	4-7
RASCAT read limit	0 (unlimited) (no default)	4-7

Option Descriptions

The descriptions for each of the options found on the General Utility Options panel are as follows:

Non-VSAM backup utility

Select a utility to back up the target non-VSAM data sets within your application group. The default is DFDSS.

VSAM backup utility Select a utility to back up the target VSAM data sets within your application group. The default is DFDSS.

Number of copies Select the number of backups you want to make (1-4). The default is 1 copy.

Offsite data set pattern

Enter the data set name pattern to identify backups generated for recovery site JCL use. See “SET OPTIONS SITETYPE Statement” on page 5-25 for important information about this option and its use.

Example: RVL.* indicates that all data sets with a high level qualifier of RVL are offsite.

RASCAT retention period

Enter the number of days to save the backup registration information in RASCAT. The limit is used by MRMBGPV to delete old entries. There is no default.

RASCAT read limit Enter the read limit in days. There is no default.

The **RASCAT read limit** defines how far into the past RECOVERY MANAGER should check RASCAT for resource availability. It limits the amount of memory required to analyze backups and limits the backups available for selection online.

Note: The online environment and the MRMBGPV batch program (used for reports), ignore backups and archives older than the number of days specified in this field.

DFDSS Backup Options

You can set backup options for DFDSS that are saved in your utility options set and then applied to any application groups using that options set. The options are listed in Table 4-2 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table. For more detailed information about IBM’s DFDSS utility, see the *Data Facility Data Set Services Reference Manual*.

Note: The minimum requirement for full support is DFDSS version 2.5.

Table 4-2 DFDSS Backup Options

DFDSS Backup Options	DFDSS Keyword	Default Value	See Page
All Data	ALLData	2 (No)	4-8
All EXCP	ALL EXCP	2 (No)	4-8
Compress	COMPRESS	2 (No)	4-8
Dynamic allocation	DYNALLOC	2 (No)	4-8
Optimize	OPTimize	1 (track)	4-8

Table 4-2 DFDSS Backup Options

DFDSS Backup Options	DFDSS Keyword	Default Value	See Page
Shared allocation	SHAre	2 (No)	4-8
VSAM Spheres	SPHERE	1 (Yes)	4-8
Tolerate I/O error	TOL IOER	2 (No)	4-9
Tolerate enqueue failure	TOL ENQ	2 (No)	4-9
Validate indexed VSAM	VALIDate	2 (No)	4-9
Wait seconds	WAIT	2	4-9
Wait retries	WAIT	2	4-9
Max parallel tasks	PARAllel	1	4-9

Option Descriptions

The descriptions of each of the options found on the DFDSS Backup Options panel are as follows:

All Data

The ALLData command causes all space allocated to each data set in your application group to be backed up, whether or not it is used. The default is **No**.

All EXCP

The ALLEXCP command instructs DFDSS to back up all data sets whose data set organization is PS, PSU, PO, POU, or null, and are empty. The default is **No**.

Compress

The COMPRESS command specifies that the dumped data is to be written in compressed format to the output medium. The default is **No**.

Dynamic allocation

The DYNALLOC command serializes the use of selected partitioned data sets, allowing cross-system serialization in a JES3/MVS environment. The default is **No**.

Optimize

The OPTimize command specifies the number of tracks to be read at one time:

- **1** reads one track at a time (the default)
- **2** reads two tracks at a time
- **3** reads five tracks at a time
- **4** reads one cylinder at a time

Shared allocation

The SHAre command specifies that DFDSS is to share the data sets to be copied for **Read** access with other programs. The default is **No**.

VSAM Spheres

The SPHERE command specifies that all associated AIX (alternate index) clusters and paths are to be copied for each VSAM cluster specified. The default is **Yes**.

- Tolerate I/O error** The TOLIOER command specifies that DFDSS is to continue processing even if input errors occur (up to 100 errors). The default is **No**.
- Tolerate enqueue failure** The TOLENQF command specifies that target data sets are to be processed even if shared or exclusive access fails. The default is **No**.
- Validate indexed VSAM** The VALID command specifies that indexed VSAM data sets are to be validated as they are dumped. The default is **No**.
- Wait seconds** Specifies the number of seconds DFDSS is to wait before attempting another pass through the list of selected data sets to obtain control of a data set. The default is **2**.
- Wait retries** Specifies the number of passes DFDSS is to make through the list of selected data sets to obtain control of a data set. The default is **2**.
- Max parallel tasks** The PARALLEL command lets you initiate parallel task scheduling; that is, two or more tasks are processed concurrently, provided the required system resources (such as virtual storage, DASD, or tape volumes) are available. The commands may not necessarily be processed in the order in which they appear in the input stream. Enter a value from 1 to 16. The default is **1**.

DFDSS Restore Options

You can set restore options for DFDSS that are saved in your utility options set and then applied to any application groups using that options set. For more detailed information about IBM's DFDSS utility, see the *Data Facility Data Set Services Reference Manual*.

Note: The minimum requirement for full support is DFDSS Version 2.5.

The options apply to data sets using DFDSS as the restore utility. Those options are listed in Table 4-3 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table.

Table 4-3 DFDSS Restore Options and Defaults

DFDSS Restore Options	DFDSS Keyword	Default Value	See Page
Bypass ACS routines	BYPASSACS	2 (No)	4-10
Cancel on error	CANcelerror	2 (No)	4-11
Catalog	CATALOG	1 (Yes)	4-11

Table 4-3 DFDSS Restore Options and Defaults

DFDSS Restore Options	DFDSS Keyword	Default Value	See Page
Recatalog name	RECATALOG	none	4-11
Delete catalog entry	DELETECATALOG ENTRY	2 (No)	4-11
Dynamic allocation	DYNALLOC	2 (No)	4-11
Force	FORce	2 (No)	4-11
Freespace CI percentage	FREESPACE CI	none	4-11
Freespace CA percentage	FREESPACE CA	none	4-11
Import	IMPORT	2 (No)	4-11
Model entity name	MENTity	none	4-11
Model VOLSER	VOLser	none	4-12
New MGMTCLAS	MGMTCLAS	none	4-12
New STORCLAS	STORCLAS	none	4-12
Rename data set prefix	RENAME	none	4-12
Rename is unconditional	RENAMEU	1 (Yes)	4-12
Replace	REPLACE	2 (No)	4-12
Shared access	SHAre	2 (No)	4-12
VSAM Sphere	SPHERE	1 (Yes)	4-12
Target allocation	TGTAlloc	4 (Source)	4-13
Target GDG status	TGTGDS	1 (DEFER)	4-13
Tolerate enqueue failure	TOL ENQF	2 (No)	4-13
Wait seconds	WAIT	2	4-13
Wait retries	WAIT	2	4-13
Write check	WRITECHECK	2 (No)	4-13
Process undefined DSORG	UNDEF	2 (No)	4-13
Max parallel tasks	PARallel	1	4-13

Option Descriptions

The descriptions for each of the options found on the DFDSS Restore Options panel are as follows:

Bypass ACS routines The BYPASSACS command allows you to assign new management and storage class names to the target data sets. (Enter the new class names in the **New MGMTCLAS** and **New STORCLAS** fields.) **No** is the default and allows the automatic class selection (ACS) routines to determine class names.

- Cancel on error** The CANCELerror command specifies that the COPY task be terminated for a permanent read error and for a write error. **No** is the default and cancels only the track in error, allowing the COPY task to continue with subsequent data sets.
- Catalog/Recatalog name** The CATALOG command catalogs target data sets in the appropriate catalog. The default is **Yes**. RECATALOG allows you to enter a new catalog name in order to recatalog a data set into a new catalog.
- Delete catalog entry** The DELETEDCATALOGENTRY command specifies that a disaster recovery is being performed and that existing catalog entries may no longer be valid. If a data set is cataloged but not available, DFDSS performs a DELETE NOSCRATCH for the data set. The default is **No**.
- Warning!** Since this option can delete data, use it with caution. See the *DFDSS Reference Manual* for more information.
- Dynamic allocation** The DYNALLOC command serializes the use of selected partitioned data sets and allows cross-system serialization in a JES3/MVS environment. The default is **No**.
- Force** The FORCE command instructs DFDSS to copy one or more unmovable data sets to a like or unlike device type. (Unmovable data sets are those allocated as “unmovable” (PSU, POU, DAU, or ISU) or as “absolute track” (ABSTR).) The default is **No**.
- Freespace CI percentage** The FREESPACE CI command specifies the percentage of free space to be kept in each control interval (CI) during the allocation of the data set. If not specified, the field defaults to the value of the source data set.
- Freespace CA percentage** The FREESPACE CA command specifies the percentage of free space to be kept in each control area (CA) during the allocation of the data set. If not specified, the field defaults to the value of the source data set.
- Import** The IMPORT command specifies that data sets being restored were dumped from a different system and should be treated as new data sets. The default is **No**.
- Model entity name** Use the MENTITY command to enter a model entity name that is used to define discrete profiles to Resource Access Control Facility (RACF). If you do not specify a model entity, DFDSS defines the data set to RACF without using a model.

- Model VOLSER** The model VOLser command contains the model entity you specified.
- Note:** The VOLser is optional when the model entity you select is cataloged in an integrated catalog facility (ICF) catalog or when a non-VSAM data set is cataloged in the standard catalog search order.
- New MGMTCLAS** Use the MGMTCLAS command to specify a management class to replace the source management class used as the input to the ACS routine. You must have proper RACF authorization for the management class specified. This field is used in conjunction with the **Bypass ACS** routines. The name must already exist and cannot exceed 8 characters.
- You can also enter **NULL**, which specifies that the input to the ACS routines is a null management class rather than the source data set's management class.
- Note:** Bypass ACS and STORCLASS NULL denote no SMS management.
- New STORCLAS** The STORCLAS command allows you to specify a storage class to replace the source storage class used as the input to the ACS routine. You must have proper RACF authorization for the storage class specified. This field is used in conjunction with the **Bypass ACS** routines. The name must already exist and cannot exceed 8 characters.
- You can also enter **NULL**, which specifies that the input to the ACS routines is a null storage class rather than the source data set's storage class.
- Rename data set prefix** This option allows you to specify a prefix to be used to replace the first-level qualifier of the data set name.
- Rename is unconditional** The RENAMEU option specifies that the data set must be saved with a new name, whether or not the data set already exists on DASD with the old name.
- Replace** The REPlace command instructs DFDSS to search the target volumes for usable preallocated data sets. If no preallocated target is found, DFDSS attempts to allocate a data set. The default is **No**.
- Shared access** The SHAre command instructs DFDSS to share the data sets that are to be restored with other programs (read-only access). The default is **No**.
- VSAM Sphere** The SPHERE command instructs DFDSS that, for any VSAM cluster copied, all associated AIX clusters and paths are also to be copied. The default is **Yes**.

- Target allocation** The TGTAlloc command specifies how DFDSS should allocate the target data set. The following are acceptable options. The default is **Source**.
- **BLK**—by block
 - **CYL**—by cylinder
 - **TRK**—by tracks
 - **Source**—with the same space allocation as the source data set
- Target GDG status** The TGTGDS command specifies the status in which DFDSS will place non-preallocated SMS (Storage Management Subsystem) managed GDG (generation data group) data sets during the data set operation. The default is **Defer**.
- **DEFER**—Target data set is assigned deferred status.
 - **ACTIVE**—Target data set is assigned active status.
 - **ROLLEDOFF**—Target data set is assigned rolled-off status.
 - **SRC**—Target data set is assigned the same status as the source data set.
- Tolerate enqueue failure** The TOL ENQF command specifies that target data sets are to be processed even if shared or exclusive access fails. The default is **No**.
- Wait seconds** This option specifies the number of seconds DFDSS is to wait before attempting another pass through the list of selected data sets to obtain control of a data set. The default is **2**.
- Wait retries** This option specifies the number of passes DFDSS is to make through the list of selected data sets to obtain control of a data set. The default is **2**.
- Write check** This option specifies that the data restored is to be verified for successful completion. The default is **No**.
- Note:** This keyword increases the overall elapsed time of the restore job.
- Process undefined DSORG** The DSORG command specifies that DFDSS allow data sets with undefined data set organizations to be copied to an unlike target with a larger capacity. The default is **No**.
- Max parallel tasks** The PARALLEL command lets you initiate parallel task scheduling; that is, two or more tasks are processed concurrently, provided the required system resources (such as virtual storage, DASD, or tape volumes) are available. The commands may not necessarily be processed in the order in which they appear in the input stream. Enter a value from 1 to 16. The default is **1**.

RUV Options

You can set certain backup and recovery options specific to RECOVERY UTILITY for VSAM on the RUV Utility Options Specification panel. Those options are listed in Table 4-4 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table. For more detailed information about BMC Software's RUV, see the *RECOVERY UTILITY for VSAM Reference Manual*. The options on this panel apply to the VSAM clusters that use RUV as the backup utility.

Note: The minimum requirement for full support is RUV version 1.1.

Table 4-4 RUV Options and Defaults

RUV Options	RUV Keyword	Default Value	See Page
Backup Options			
Prefix	PREFIX	1 (Yes)	4-14
Recovery Options			
Selection exit	SELECTION_EXIT	none	4-14

Option Descriptions

The descriptions for each of the options found on the RUV Options panel are as follows:

Backup Options

Prefix Instructs RUV to place a backup record prefix before each backup. The default is **Yes**.

Recovery Options

Selection exit RUV can call one user-written exit program during processing. Call the user exit by specifying the name of a user exit program in this field.

XBM with SCV Options

You can set backup options specific to the EXTENDED BUFFER MANAGER for CICS with SNAPSHOT COPY for VSAM (XBM with SCV) product on the XBM Utility Options Specification panel. Those options are listed in Table 4-5 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table. For more detailed information about BMC Software's XBM with SCV, see the *EXTENDED BUFFER MANAGER Reference Manual*.

The options on this panel apply to the VSAM data sets using XBM with SCV as the backup utility.

Note: The minimum requirement for full support is XBM version 4.1.

Table 4-5 XBM with SCV Options

XBM with SCV Options	XBM Keyword	Default Value	See Page
XBM subsystem or group	XB MID	none	4-15
Group	GROUP	2 (No)	4-15
Concurrent	CONCURRENT	1 (Preferred)	4-15
CICS quiesce	CICSQUIESCE	2 (No)	4-16
CICS APPLID	APPLID	none	4-16
Close transaction	CLOSTRAN	none	4-16
Close program	CLOSPROG	none	4-16

Option Descriptions

The descriptions for each of the options found on the XBM with SCV panel are as follows:

XBM subsystem or group

Type the XBM subsystem ID (XB MID) or the XBM coupling facility group name (XBMGROUP). Doing so is not required when you specify **Standard** as the **Concurrent** selection.

Group

Select **Yes** to specify that copies of all the target data sets share a common consistent copy point in time. Select **No** (the default) to specify that the copy of each data set may be to a different point in time.

- Concurrent** Select **Standard** (the default) to specify that no XBM with SCV requirements exist. You are not required to enter an XBM subsystem ID when you select **Standard**.
- Select **Preferred** to specify that the copy job should attempt to create copies with a common consistent point in time. If the copy job cannot do this, it creates standard copies and issues a return code 4.
- Select **Required** to specify that the copy job should attempt to create copies with a common consistent point in time. If the copy job cannot do this, the entire job is terminated.
- CICS quiesce** When set to **Yes**, this option directs XBM to perform a quiesce for all data sets included in the job. The default is **No**.
- Note:** User step libraries one, two, and three must contain the CICS SDFHEXCI library data set name when **CICS quiesce** is set to **Yes**.
- CICS APPLID** Enter the VTAM application ID of the CICS region that owns the data set that you want quiesced.
- Close transaction** Enter the keyword you use to define a custom transaction ID name to the XBM Utility Program. Use this keyword only if you replaced the default transaction ID name, XVCL, with a custom name when you defined the transaction to your CICS CSD. *xxxx* is the custom name you supply.
- Close program** Enter the keyword that you use to define a customized program name to the XBM utility program. Use this keyword only if you renamed the default program name, XBMVCLOS, with a custom name when you defined the program to your CICS CSD. *xxxxxxx* is the custom name you supply.

ABARS Backup Options

ABARS is a component of IBM's DFSMSHsm program. With ABARS, you can back up and recover a group of data sets. RECOVERY MANAGER's ABARS Backup Utility Options Specification Panel lets you set backup options specific to ABARS.

The options are listed in Table 4-6 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table. For more information about these options, see the *IBM MVS/ESA DFSMSHsm Storage Administration Guide (ABARS)*.

Table 4-6 ABARS Backup Options

ABARS Backup Options	ABARS Keyword	Default Value	See Page
Unit	UNIT	none	4-17
Stack data sets on tape	STACK/NOSTACK	The setting specified by SETSYS ABARTAPES	4-17
Delete data sets after backup	MOVE	2 (No)	4-18
Filter output data set	FILTEROUTPUTDATASET	none	4-18
Process only specific categories	PROCESSIONLY	none	4-18
Optimize	OPTIMIZE	none (The setting of the SETSYS ABARSOPTIMIZE)	4-18

Option Descriptions

The descriptions for each of the options found on the ABARS Backup Utility Options Specification panel are as follows:

Unit

The UNIT command is used to specify the type of tape unit where the backup data sets are written. The default is the unit name specified by the SETSYS command. Valid types are as follows:

- 3400-3, 3400-4, 3400-5, 3400-6, 3400-9
- 3480
- 3480X
- 3490

Stack data sets on tape

The STACK/NOSTACK command specifies whether data sets are to be written contiguously to minimize the number of tapes (**Yes**) or to different tapes (one data set per tape) (**No**). The default is the setting specified by SETSYS ABARTAPES.

Delete data sets after backup

The MOVE option is used to remove the data sets after a successful copy. How the data sets are processed depends on the data set type, as follows. The default is No.

- **DASD**—data sets are migrated
- **TAPE**—data sets are uncataloged
- **ACCOMPANY**—data sets are uncataloged
- **ALLOCATE**—data sets are deleted from DASD
- **MIGRATED**—data sets are deleted

Filter output data set The FILTEROUTPUTDATASET command is used to specify the name of the data set where the lists of data sets selected by INCLUDE/EXCLUDE, ALLOCATE/ALLOCATEEXCLUDE, and ACCOMPANY/ACOMPANYEXCLUDE are filtered.

Provide a data set name of not more than 44 characters. This name can be an existing data set. There is no default.

Process only specific categories

The PROCESSIONLY command is used to specify the category of data set to be processed as follows. There is no default.

- **Level 0** specifies that only data sets residing on user DASD are to be processed.
- **Migration Level 1** specifies that only data sets residing on DFSMSHsm migration Level 1 DASD are to be processed.
- **Migration Level 2** specifies that only data sets residing on DFSMSHsm migration Level 2 tape are to be processed.
- **User tape** specifies that only data sets residing on user tape are to be processed.

Optimize

The OPTIMIZE command is used by DFSMSdss when backing up Level 0 DASD data sets. Use it to override the SETSYS ABARSOPTIMIZE command as follows:

- **1** reads one track at a time.
- **2** reads two tracks at a time.
- **3** reads five tracks at a time.
- **4** reads one cylinder at a time.

The default is the setting of the SETSYS ABARSOPTIMIZE command.

ABARS Recovery Options

Use the ABARS Recover Utility Options Specification panel to set recovery options for ABARS aggregates. Data sets backed up using ABARS options must be recovered using ABARS utility options.

The options are listed in Table 4-7 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table. For more information about these options, see the *IBM MVS/ESA DFSMSshm Storage Administration Guide (ABARS)*.

Table 4-7 ABARS Recovery Options

ABARS Recover Options	ABARS Keyword	Default Value	See Page
Control File Cataloged		1 (Yes)	4-19
Recover Activity Log	ACTIVITY	1 (Yes)	4-19
Recover Instruction data set	INSTRUCTION	1 (Yes)	4-20
Percent Non-SMS DASD Utilization	PCTU	none	4-20
Target Unit	TARGETUNIT	none	4-20
Migration Level	MIGRATEDDATA	ML1	4-20
Data set name conflict action	DATASETCONFLICT	3 (Bypass)	4-21
New qualifier		none	4-21
New recovered data set qualifier	RECOVERNEWNAME ALL	none	4-21
Target GDG Status	TGTGDS	none	4-21
Model Entity Name	MENTITY	none	4-22
Volume Count Any	VOLCOUNT	none	4-22

Option Descriptions

The descriptions for each of the options found on the ABARS Recovery Utility Options Specification panel are as follows:

Control File Cataloged

Specify **Yes** if the control file at your recovery site has been cataloged. **No** indicates that the control file has not been cataloged. The default is **Yes**.

Recover Activity Log The **ACTIVITY** command recovers the activity log data set if one exists on the output tape for the specified aggregate group. The default is **Yes**.

Recover Instruction data set

The INSTRUCTION command recovers the instruction data set if one exists on the output tape for the specified aggregate group. The default is **Yes**.

Percent Non-SMS DASD Utilization

The PERCENTUTILIZED command allows the Level 0 volumes in the associated ARPOOL to be filled up to 100% for the aggregate. Enter an integer between **1** and **100**. If you do not specify a value, 80 percent (**080**) is used (the default value of the SETSYS ARECOVERPERCENTUTILIZED parameter).

Target Unit

Specify the type of tape unit to receive data sets recovered to tape units. The following types of tape units are valid:

- 3400-3, 3400-4, 3400-5, 3400-6, 3400-9
- 3480
- 3480X
- 3490
- 3590-1

Migration Level

This command specifies the migration level when recovering migrated data sets:

- Use **ML1** if all migrated data sets are to be recovered to migration Level-1 DASD. This is the default.
- Use **ML2** if all migrated data sets are to be recovered to nonspecific tape volumes that are then managed as migration Level-2 volumes.
- Use **SourceLevel** if all ML1 migrated data sets are to be recovered to migration Level-1 DASD and all ML2 migrated data sets are to be recovered to nonspecific tape volumes.

Data set name conflict action

Use this optional parameter to resolve any data set naming conflicts as described below. The default is 3.

- **Rename source with new qualifier** recovers the data sets from the aggregate backup output files with the new qualifier specified in the **New qualifier** field.
- **Rename target with new qualifier** renames the existing data sets at the recovery site with the new qualifier specified in the **New qualifier** field. The data sets from the aggregate backup output files are recovered with their original name.
- **Bypass recovery for the data set** skips and does not recover data sets from the aggregate backup output files.
- **Replace the existing data set** deletes the existing data set at the recovery site and replaces it with the data set from the aggregate backup output files.

New qualifier Specify a new qualifier to be used for recovered data sets. There is no default.

New recovered data set qualifier

Use this option to specify the new qualifier to be used for recovered data sets. There is no default.

Target GDG Status

Use this option to provide greater flexibility for managing SMS-managed generation data sets that are being recovered to Level-0 DASD. Select from the following choices. The default is the setting specified on the SETSYS ARECOVERGTGDS command, if specified; otherwise, there is no default.

- **DEFER** specifies that the target data set is to be assigned the DEFERRED status.
- **ACTIVE** specifies that the target data set is to be assigned the ACTIVE status.
- **ROLLED OFF** specifies that the target data set is to be assigned the ROLLEDOFF status.
- **SRC (SOURCE)** specifies that the target data set is to be assigned the same status as the source data set.

Model Entity Name This option specifies the predefined model entity. If it is not specified and a discrete profile is not predefined, the data set is recovered with a default discrete profile. There is no default.

Warning! If the parameter is specified in the ARECOVER command but the model entity is not predefined, the recovery fails. For more information about this command, see the *IBM MVS/ESA DFSMSShsm Storage Administration Guide (ABARS)*.

Volume Count Any This option determines how DFSMSShsm invokes DFSMSDss during the recovery of data sets that were dumped by DFSMSDss. There is no default.

Yes allocates the target data sets on as many volumes as required, to a maximum of 59.

No allocates the target data sets on the number of volumes specified in the SETSYS ABARSVOLCOUNT setting.

RAMAC SnapShot for MVS/ESA Options

RAMAC SnapShot for MVS/ESA is used to make quick backups of DASD data. It can save you the downtime associated with other backup procedures.

The options are listed in Table 4-8 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table. For more information about these options, see the *IBM RAMAC SnapShot for MVS/ESA Reference Guide*.

Note: The minimum requirements for full support are IXFP 2.1 and RAMAC SnapShot for MVS/ESA 1.2.

Table 4-8 RAMAC SnapShot for MVS/ESA Options

IBM RAMAC SnapShot Specific Options	Default Value	See Page
Tolerate Enqueue Error	2 (No)	4-23
Replace	2 (No)	4-23
Force	2 (No)	4-23
Shared access	2 (No)	4-23
Use DFDSS Data Mover	2 (No)	4-23
MGMTCLAS	none	4-24
STORCLAS	none	4-24

Table 4-8 RAMAC SnapShot for MVS/ESA Options

IBM RAMAC SnapShot Specific Options	Default Value	See Page
Volume	none	4-24
Esoteric	none	4-24

Option Descriptions

The descriptions for each of the options found on the IBM RAMAC SnapShot Options Specification panel are as follows:

Tolerate Enqueue Error

Specify **Yes** to enable backing up of a data set that is unavailable at the exclusive-serialization level. Specify **No** if the data set is not to be backed up if it is unavailable at the exclusive serialization level. The default is **No**.

Note: The integrity of data sets without exclusive serialization cannot be assured.

Replace

This option specifies whether the source data set is to overwrite any data in an existing target data set. Specify **Yes** if you want to overwrite the existing data set. Specify **No** if you do not want the existing data set to be overwritten. The default is **No**.

Force

This option lets you back up a data set that was created as absolute track or as unmovable. Specify **Yes** to indicate that an unmovable or absolute-track data set can be backed up to a different physical track location on the same or another device. Specify **No** to indicate that an unmovable or absolute-track data set is not to be backed up unless the target location is identical to the source. The default is **No**.

Shared access

This option specifies the level of serialization control to be obtained for the source and target data sets. Specify **Yes** for a disposition of SHR. If you specify **No** for a disposition of OLD, then the option gives you exclusive control. The default is **No**.

Use DFSS Data Mover

Specify **Yes** if the target volume is not in the same RAMAC Virtual Array subsystem and partition as the source volume. The data mover physically copies the volume. As this is a conventional copy, the process takes longer.

Specify **No** if the target volume is in the same RAMAC Virtual Array subsystem and partition as the source volume. The default is **No**.

- MGMTCLAS** Use this option to indicate the SMS management class to be assigned to the target data set. The name must already exist and cannot exceed 8 characters.
- STORCLAS** This option specifies the name of the target DASD device onto which the backup is placed. Type the name of the SMS storage class for the newly allocated target data set. The name must already exist and cannot exceed 8 characters.
- Note:** If you specify a storage class name, you cannot specify a volume or esoteric name. These three options are mutually exclusive.
- Volume** This option specifies the target volume onto which the backup is placed.
- Note:** If you specify a volume name, you cannot specify an esoteric name or a storage class (STORCLAS). These three options are mutually exclusive.
- Esoteric** This option specifies the name of the target DASD device onto which the backup is placed.
- Note:** If you specify an esoteric name, you cannot specify a volume or storage class (STORCLAS). These three options are mutually exclusive.

FDR Backup Options

Innovation Data Processing's Fast Dump Restore Data Set Functions utility backs up and restores data sets. FDR DSF creates a sequential file that contains an image of all data sets that were backed up from one disk volume.

The options are listed in Table 4-9 along with the RGMR defaults. The options are also described individually following the table. For more information about these options, see the *Fast Dump Restore (FDR) User Manual*.

Note: The minimum requirement for full support is FDR version 5.2.

Table 4-9 FDR Backup Options

FDR Backup Options	FDR Option	Default Value	See Page
Attach subtasks	Attach	2 (No)	4-25
Compress output	Compress	2 (No)	4-25
Data to dump	Data	2 (Used)	4-25
Dataset enqueue	DSNENQ	1 (none)	4-25

Table 4-9 FDR Backup Options

FDR Backup Options	FDR Option	Default Value	See Page
Enqueue vtoc	ENQ	2 (Off)	4-26
Issue U0888 if in use	ENQERR	1 (Yes)	4-26
Action if in use	ENQERR	1 (Process)	4-27
Format of backup file	Format	1 (New)	4-27
Size of incore table	ICFCORE	53248	4-27
Empty datasets	LBPZERO	2 (Invalid)	4-27
Maximum control cards	MAXCARDS	250	4-27
Maximum errors allowed	MAXERR	20	4-27
Issue U0888 if select err	SELTERR	1 (Yes)	4-28

Option Descriptions

The descriptions for each of the options found on the FDR Backup Options Specification panel are as follows:

Attach subtasks

This option specifies whether DSF is to dump the disk volumes concurrently. **Yes** specifies that you want concurrent dumps, and DSF attaches a subtask for each unique tape drive specified. **No** specifies that DSF is to process each DISKx/TAPEx pair singly, in the order that the DISKx DD's appear in the JCL. **No** is the default.

Compress output

This option specifies whether DSF is to compress the output data on the backup file. **Yes** specifies that you want the backups to be compressed. **No** specifies that you do not want the backups to be compressed. **No** is the default.

Data to dump

This option specifies which portion of type PS or PO data sets you want DSF to dump. **All** specifies that you want DSF to dump the entire data set. **Used** specifies that you want DSF to dump only the used portion of PS or PO type data sets. When you select **Used**, the dump runs faster, but it may not back up all of the data if data sets have invalid last block pointers. If the data set has a last block pointer of all zeroes, (usually means it was never used), DSF defaults to dumping the entire data set unless the **Empty datasets** option is set to **Valid**. In this case, DSF dumps only the first track. **Used** is the default.

Dataset enqueue

This option specifies whether DSF is to enqueue all of the data sets on the volume being dumped. DSF issues an exclusive enqueue with a major name of SYSDSN and a minor name of the data set name. The job scheduler uses this enqueue. The following options can be used in this field:

1. **None**—DSF does not issue a data set enqueue. This is the default.
2. **Test**—Data sets are tested to see if they are active at the time the dump starts. DSF does not issue a data set enqueue.
3. **Use**—Data sets are enqueued for the duration of the dump. If the data sets are not available, DSF issues a warning message and does not enqueue them.
4. **Have**—Data sets are enqueued for the duration of the dump. If the data sets are not available, DSF issues warning message FDRW27 to the operator. The operator can then reply as follows:
 - **WAIT**—DSF waits until the data set is available. Be aware that the job might time out.
 - **NOWAIT**—DSF prints a warning message for the data set and does not issue the enqueue.
 - **RETRY**—DSF attempts the enqueue again.

Warning! Innovation Data Processing warns that this option should not be used on shared DASD unless a cross-system enqueue facility is available and the SYSDSN QNAME is broadcast across systems. Otherwise, DSF can only determine which data sets are active on the system on which DSF is running.

Enqueue vtoc

This option specifies whether DSF is to perform an enqueue on the VTOC during the dump. You can select from these options:

1. **On**—DSF performs an enqueue on the VTOC during the dump operation. The enqueue prevents other tasks from allocating new data sets or scratching old data sets on the system on which DSF is running.
2. **Off**—DSF does not enqueue the VTOC during the dump. **Off** is the default.
3. **Reserve**—DSF issues a RESERVE on the volume being dumped. This command locks out a shared DASD system from accessing the pack.

Issue U0888 if in use

When **No** is selected, DSF does not issue the U0888 ABEND at the end of the DSF execution if the **Dataset enqueue** option is used and an active data set is found. When **Yes** is selected, DSF issues the U0888 ABEND. **Yes** is the default.

Action if in use	<p>This option specifies the action DSF takes if an active data set is found.</p> <ol style="list-style-type: none">1. Bypass specifies that DSF is not to dump a data set if the Dataset enqueue option is used and the data set is active.2. Process specifies that DSF is to dump a data set even if the Dataset enqueue option found it to be active. Process is the default. <p>Note: You can specify both the Issue U0888 if in use option and the Action if in use option.</p>
Format of backup file	<p>This option specifies the format of the sequential backup file. New specifies that FDR is to create the backup using a maximum of a 56K blocksize. New is the default. Split specifies that DSF is to create the backup using a maximum blocksize of 32K. DSF splits the backup blocks into multiple records.</p>
Size of incore table	<p>This option specifies the size to which DSF is to increase the table that stores the ICF VSAM cluster and component names. DSF must save all of the component names and their associated clusters which currently exist on the volume. The size is specified in bytes (between 0 and 999999) and must be large enough to contain all the VSAM names. Specifying this option increases the DSF memory requirement by the value specified. The default is 53248; this holds approximately 650 components.</p>
Empty datasets	<p>Valid specifies that DSF is to consider empty PS data sets as containing one used track. These have a last block pointer of zero. Invalid specifies that DSF is to consider empty PS data sets as fully used. Invalid is the default.</p> <p>Warning! Be careful when using the Valid option since some data sets might have the last block pointer as all zeroes and not be empty.</p>
Maximum control cards	<p>This option enables DSF to accept additional control statements. You can specify 1 through 99,999 control statements. A maximum of 250 control statements is the default.</p>
Maximum errors allowed	<p>This option specifies the number of tape or disk errors that DSF permits before ABENDING the dump operation. You can specify 1 through 9,999 errors. 20 errors is the default.</p> <p>Warning! Specifying a number greater than the default value (20) could result in the loss of data sets. Use this option only when necessary.</p>

Issue U0888 if select err

No specifies that DSF is not to issue a U0888 abend if a SELECT statement is not referenced. **Yes** specifies that DSF will issue a U0888 abend at the end of the dump if any SELECT/EXCLUDE statement did not apply to any data set on any input disk. The default is **Yes**.

FDR Restore Options

Innovation Data Processing's Fast Dump Restore Data Set Functions utility restores the requested data sets to a disk volume.

Note: Be aware of the following:

- A SELECT statement exists for each data set to be restored. If more than 36 different volumes are referenced in the restore, additional steps are created with all possible SELECT statements on each step.
- A maximum of 36 TAPE_x DD statements exist per step, and a particular TAPE_x DD appears only once, regardless of the number of steps. Message FDR316 is issued for a select statement without a matching TAPE_x DD.
- The FDR parameter SELTERR is set to **No** as the BMC Software default (FDR sets it to **Yes** as the default) so that FDR DSF does not issue a U0888 ABEND if a SELECT statement is not referenced.

The options are listed in Table 4-10 along with the RGMR defaults. The options are also described individually following the table. For more information about these options, see the *Fast Dump Restore (FDR) User Manual*.

Note: The minimum requirement for full support is FDR version 5.2.

Table 4-10 FDR Restore Options

FDR Restore Options	FDR Option	Default Value	See Page
Reblock dataset	BLKF	0 (None)	4-29
Bypass ACS routines	BYPASSACS	2 (No)	4-29
Bypass SMS selection	BYPASSSMS	2 (No)	4-30
Catalog if pre-allocated	CATIFALLOC	2 (No)	4-30
Restore data	DATA	2 (Used)	4-30

Table 4-10 FDR Restore Options

FDR Restore Options	FDR Option	Default Value	See Page
Dataset enqueue	DSNENQ	1 (None)	4-31
Catalog source for vsam	ICFCAT	1 (Original)	4-32
Maximum control cards	MAXCARDS	250	4-32
Maximum errors allowed	MAXERR	20	4-32
Restore if already exists	PRESTAGE	2 (No)	4-32
Release unused space	RLSE	2 (No)	4-32
Percent free space	%FREE	99	4-32
Issue U0888 if select err	SELTERR	2 (No)	4-33
Status of SMS gdg	SMSGDG	1 (Deferred)	4-33
Recatalog vsam if exists	VRECAT	1 (Yes)	4-33

Option Descriptions

The descriptions for each of the options found on the FDR Restore Options Specification panel are as follows:

Reblock dataset

This option specifies that DSF is to reblock PS fixed and variable record formats and PO data sets. The blocking factor must result in a larger block size or it is ignored, except when restoring a PS file to a smaller disk. On partitioned data sets, DSF sets the block size to a higher value, but does not actually reblock the members. Specify a value of **0** to **10**. **0** is the default.

- **0**—no reblocking.
- **1**—full track blocking (max 32760)
- **2**—half track
- **10**—a tenth of one track blocking

On fixed files, DSF rounds down to a multiple of the LRECL.

Note: The restore will fail if the input data set has blocks larger than the track size of the output disk.

Bypass ACS routines

On a system running SMS (System Managed Storage), this option specifies whether the SMS ACS (Automatic Class Selection) routines are to be invoked for data sets that DSF must allocate.

When **No** (the default) is selected, the SMS ACS routines are invoked for every data set that must be allocated. The assigned storage and management classes are passed to those routines, where they can be approved or overridden. If the storage class ACS routine assigns a storage class to a data set, that data set is passed to SMS for allocation. Select **Yes** if you want to skip the ACS routines.

Bypass SMS selection

On a system with SMS (System Managed Storage) active, this option specifies whether DSF is to directly allocate data sets on SMS-managed volumes, bypassing normal SMS storage group and volume selection.

No (the default) specifies that on an SMS system, for data sets that are SMS-managed and must be allocated, the SMS storage group ACS routine will be invoked to select a storage group. SMS selects an SMS-managed volume and allocates and catalogs the data sets. **Yes** specifies that you want to bypass normal SMS storage group and volume selection and allocate data sets to meet your site's needs.

Catalog if pre-allocated

This option specifies that non-VSAM output data sets are cataloged by DSF, whether or not they were allocated by DSF. The output data set is cataloged if it is not already cataloged on another volume. **Yes** specifies that DSF will catalog and allocate output data sets. **No** (the default) specifies that DSF is to catalog the output data sets only when it allocates them.

Restore data

This option specifies which part of data sets are to be restored. **All** specifies that DSF is to restore the entire data set.

Note: **Restore data All** should not be specified in conjunction with the **Release unused space** and **Percent free space** options.

Used (the default) specifies that DSF only restore the used portion of the data set for PS or PO files.

Dataset enqueue

This option specifies whether DSF is to enqueue all of the data sets on the volume being restored. DSF issues an exclusive enqueue with a major name of SYSDSN and a minor name of the data set name. The job scheduler uses this enqueue. The following options can be used in this field:

1. **None**—DSF does not issue a data set enqueue. This is the default.
2. **Test**—Data sets are tested to see if they are active at the time of the restore. DSF does not issue a data set enqueue.
3. **Use**—Data sets are enqueued for the duration of the restore. If the data sets are not available, the data sets are not restored.
4. **Have**—Data sets are enqueued for the duration of the restore. If the data sets are not available, DSF issues warning message FDRW27 to the operator. The operator can then reply as follows:
 - **WAIT**—DSF waits until the data set is available. Be aware that the job might time out.
 - **NOWAIT**—DSF prints a warning message for the data set and does not restore it.
 - **RETRY**—DSF attempts the enqueue again.

Warning! Innovation Data Processing warns that this option should not be used on DASD unless a cross-system enqueue facility is available and the SYSDSN is broadcast across systems. Otherwise, DSF can only determine which data sets are active on the system on which DSF is running.

Catalog source for vsam

This option specifies the source of the catalog name DSF is to use if an output ICF VSAM cluster is to be allocated. You can choose from these options:

1. **Original** specifies that DSF is to use the catalog in which the original dumped cluster was cataloged. This applies only when you are restoring to the same name. When you are restoring to a new name, DSF ignores this setting and uses **Alias**. This is the default.
2. **Stepcat** specifies that DSF is to use the STEPCAT as the catalog. If a STEPCAT DD statement is not supplied, DSF uses the master catalog or the catalog that is used as the alias for this data set in the master catalog.
3. **Alias** specifies that DSF is to determine the catalog from the alias name in the master catalog. If no alias is found and the cluster is being restored to the same name, DSF uses the input cluster's catalog. If no alias is found and the cluster is being restored to a new name, DSF uses the STEPCAT (if present in the JCL) or the master catalog.

DSF supports multilevel aliases.

Maximum control cards

This option enables DSF to accept additional control statements. You can specify a maximum of 1 to 99,999 control statements. The default is **250**.

Maximum errors allowed

This option specifies the number of tape or disk errors that DSF is to bypass before issuing an abend. You can specify from 1 to 99,999 errors. The default is **20**.

Restore if already exists

This option specifies whether DSF is to restore a data set if the output data set already exists on the selected output volume. Use it to avoid restoring data sets that have already been restored. **Yes** specifies that you *do not* want to overwrite the contents of existing data sets. **No** (the default) specifies that you *do* want to overwrite existing data sets.

Release unused space

Yes specifies that DSF is to release all of the unused space in the output data sets for selected PS and PO data sets. **No** (the default) specifies that DSF is not to release the unused space in the output data sets for selected PS and PO data sets.

Percent free space

This option specifies the percentage of the PS and PO data sets to be left free after the restore. You can specify from **0** to **99**. **0** frees all of the free space. **99** attempts to leave the data sets with 99 percent free space. Space is released only from data sets allocated by DSF. The default is **99**.

Issue U0888 if select err

No specifies that DSF is not to issue a U0888 abend if a SELECT statement is not referenced. This is the default. **Yes** specifies that DSF is to issue a U0888 abend at the end of the restore if any SELECT/EXCLUDE statement did not apply to any data set on any backup data set.

Status of SMS gdg

This option specifies the status of SMS-managed GDG (generation data group) data sets that were allocated by DSF. Select from the following GDG statuses:

- **Deferred** (the default)
- **Active**
- **Rolledout**

Recatalog vsam if exists

This option specifies whether ICF VSAM clusters are allocated and cataloged, even if they already exist in the target ICF catalog. **Yes** (the default) specifies that the existing VSAM clusters are to be overwritten. **No** specifies that ICF VSAM clusters are not to be allocated if the cluster name already exists in the catalog, even if the catalog points to the output volume.

Output Data Set Options

You can set a wide range of output data set options on the Output Data Set Options Specification panel. The options are listed in Table 4-11 along with the corresponding RECOVERY MANAGER defaults, and are described individually following the table.

Note: Specify which backups you want to make in the General Utility Options Specification panel described in “General Utility Options” on page 4-6.

Table 4-11 Output Data Set Options

Output Data Set Option	KeyWord	Default Value	See Page
Individual dsname	DSN	&DSNH27.&TYPE& DATE.T&TIME	4-34
Group level dsname	DSN	&PREFIX.&GROUP. &TYPE&DATE.T&TIME. TASK&##	4-34
Unit	UNIT	SYSALLDA	4-34
Tape	TAPE	2 (No)	4-35
Allocation type	SPACE	1 (Cylinder)	4-35

Table 4-11 Output Data Set Options

Output Data Set Option	KeyWord	Default Value	See Page
Primary allocation		10	4-35
Secondary allocation		20	4-35
SMS storage class	STORCLAS	none	4-35
SMS data class	DATACLAS	none	4-35
SMS management class	MGMTCLAS	none	4-35
Retention period	RETPD	0	4-35
Expiration date	EXPDT	99000	4-36

Option Descriptions

The descriptions for each of the options found on the Output Data Set Options panel are as follows:

Individual dsname Specifies the name of the disk or tape data set for the current backup type. You can use symbolic variables to construct this name. Generation data groups are not allowed.

The default for **Individual dsname** is &DSNH27.&TYPE&DATE.T&TIME.

Group level dsname Specifies the name of the backup used with DFDSS, ABARS, and FDR. You can use symbolic variables to construct this name. Generation data groups are not allowed.

The default for **Group level dsname** is &PREFIX.&GROUP.&TYPE&DATE.T&TIME.TASK&##.

Note: When using FDR, the symbolic variable &VOL is also required.

Unit Specifies the device name of the disk or tape unit to which the backup data sets will be written. The default is **SYSALLDA**.

Note: If you make an entry in the **Unit** field, you must make an entry in the **Tape** field. Otherwise, you will receive an Invalid Combination message.

Tape	<p>Specifies that the unit is a tape when you respond Yes and when you also provide the name of a disk or tape unit at the Unit prompt. Responding No specifies a disk. The default is No.</p> <p>Note: If you make an entry in the Tape field, you must make an entry in the Unit field. Otherwise, you will receive an Invalid Combination message.</p>
Allocation type	<p>Specifies whether the primary and secondary allocation quantities are expressed in cylinders or tracks for disk units.</p> <p>This option does not apply to tape units. The default is Cylinder.</p>
Primary allocation	<p>Specifies the primary allocation quantity (disk only).</p>
Secondary allocation	<p>Specifies the secondary allocation quantity (disk only).</p>
SMS storage class	<p>Specifies a valid SMS storage class name for disk data sets.</p> <p>The name must not exceed 8 characters. RECOVERY MANAGER forces Catalog Yes when this option is specified. There is no default.</p>
SMS data class	<p>Specifies a valid SMS data class name for disk data sets.</p> <p>The name must not exceed 8 characters. RECOVERY MANAGER forces Catalog Yes when this option is specified. There is no default.</p>
SMS management class	<p>Specifies a valid SMS-management class name for disk data sets.</p> <p>The name must not exceed 8 characters. RECOVERY MANAGER forces Catalog Yes when this option is specified. There is no default.</p>
Retention period	<p>Specifies the retention period for the tape copy data set in days.</p> <p>The valid range is 1 through 9999. The default value is 0.</p> <p>Warning! Retention period and Expiration date are mutually exclusive. If the retention period is used in the system-wide default options, that selection will override the Expiration date setting at the group level. Remove Retention period from system defaults if you want to set an expiration date at the group level.</p>

Expiration date Specifies the expiration date for a tape copy data set.

The date must be in the format *yyddd* or *yyyy/ddd*. If the expiration date is January 1, 2000 or later, you must use *yyyy/ddd*. The default is **99000**.

Warning! **Expiration date** and **Retention period** are mutually exclusive. If the retention period is used in the system-wide default options, that selection will override the **Expiration date** setting at the group level. Remove **Retention period** from system defaults if you want to set an expiration date at the group level.

Symbolic Variables in Backup Data Set Names

With RECOVERY MANAGER, you can request that backups of data sets you recover be made when the recovery is complete. You can accept RECOVERY MANAGER defaults for the data set names, or you can supply your own data set names. Construct those names using the symbolic variables shown in Table 4-12, “Symbolic Variables for Backup Data Set Names,” on page 4-36.

Table 4-12 Symbolic Variables for Backup Data Set Names

Symbol	Result ¹
&OWN	group owner (length 8)
&GROUP	first 8 characters of group name (lowercase characters are converted to uppercase, blanks or non-printable characters are converted to #)
&DSNHnn	the high level nn characters of the data set name
&DSNLnn	the low level nn characters of the data set name
&HLQ	the high level qualifier of the data set name (the first node)
&PREFIX	TSO profile command prefix set for the TSO user ID
&USERID, &UID	your TSO user ID
&SSID	the ID of this MVS system
&DATE	the current date (in <i>yymmdd</i> format) ²
&JDATE	the current date (in <i>yyddd</i> Julian-date format) ²
&TIME	the current time (in <i>hhmmss</i> format) ²

1. The maximum total length allowed for a data set name is 44 bytes.
2. Symbols with a numeric result must be prefixed by one or more alphabetic characters.

Table 4-12	Symbolic Variables for Backup Data Set Names
&YEAR	the current year (in <i>yy</i> format) ²
&MONTH	the current month (in <i>mm</i> format) ²
&DAY	the current day (in <i>dd</i> format) ²
&JDAY	the current day (in <i>ddd</i> Julian format) ²
&HOUR	the current hour (in <i>hh</i> format) ²
&MINUTE	the current minute (in <i>mm</i> format) ²
&SECOND	the current second (in <i>ss</i> format) ²
&TYPE	the type of output being produced as follows: <ul style="list-style-type: none"> • LP for copy 1 • LB for copy 2 • RP for copy 3 • RB for copy 4
&VOL	the volser of the data set being backed up; required when using FDR ²

1. The maximum total length allowed for a data set name is 44 bytes.
2. Symbols with a numeric result must be prefixed by one or more alphabetic characters.

Utility Options Sets

Utility options are specified in advance and saved as a named set. These sets can then be assigned to your application groups. Additionally, you can establish a set of utility options to be used as system-wide defaults at your facility. See the following sections for detailed information:

- “Creating a Utility Options Set” on page 4-38
- “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41
- “Selecting a Utility Options Set” on page 4-44
- “Groups Referencing a Utility Options Set” on page 4-47

Creating a Utility Options Set

Summary: You can create and save sets of utility options and associate them with application groups or save the set as your organization’s system-wide default options.

» **Important Recommendation:**

BMC Software recommends that you establish system-wide utility options defaults before you specify utility options values for a group.

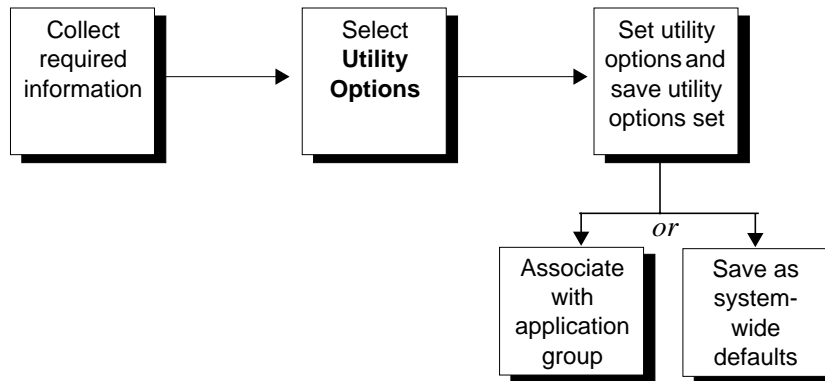


Figure 4-1 Creating Utility Options

Before You Begin

To perform this procedure, you need the following:

- **Read** and **Alter** authority on the repository data sets
- the following information specific to the task:
 - the backup and recovery utilities that you will use
 - the backup and recovery options that you will use

To Create a Utility Options Set

To create a utility options set, you must copy an existing set, make changes to it, then save it with a new name. Begin at the Utility Options Maintenance panel, which you can reach using the following methods:

- Select **Utility Options** from the Main Menu.
- Select **Group Edit** from the Data Set List panel for a group, then select **Utility Options** from the Group Edit panel.

Step 1 Type the name of the utility options set or a wildcard pattern in the **Name or pattern** field.

Note: See “Defining Groups in RECOVERY MANAGER” on page 3-5 for a list of acceptable wildcard characters.

Step 2 Type **C** in the **Act** field beside a utility options set to copy it, then press **Enter**.

The Update Utility Options Specification panel appears.

Note: You can base your new set on your organizations’s default set (\$\$\$\$BMC.DEFAULT_OPTIONS) or on the RECOVERY MANAGER default set (\$\$\$\$BMC.TEMPLATE_OPTIONS).

Step 3 Select a utility option type and press **Enter**. The Option Specification panel for that option type appears. Make your changes, then press **Enter** to return to the Update Utility Options Specification panel.

Step 4 Repeat Step 3 for each of the option types you want to include in the utility options set, then press **F3**.

The Utility Options Save Confirmation panel appears. You can choose to:

- create a new options set—select **SaveAs**.
- cancel the changes and return to the Utility Options Maintenance panel—select **Exit**.

- cancel the save and return to Step 3—select **Cancel**.
- save the new options set you have created as the default options set—select **SetDefault**. The new set is saved as `$$$$BMC.DEFAULT_OPTIONS`.

Note: The system-wide default set of utility options is automatically named `$$$$BMC.DEFAULT_OPTIONS`. It must be saved under this name in order for RECOVERY MANAGER to recognize it as the system-wide default set. You can save another utility options set with this name in order to designate it as the system-wide default set.

In addition to the system-wide default set of utility options that you create, RECOVERY MANAGER for OS/390 ships with a predefined set of product default utility options named `$$$$BMC.TEMPLATE_OPTIONS`. You can copy this file for use as a template when creating other utility options sets, but you cannot edit or delete it.

Browsing, Updating, or Deleting a Utility Options Set

Summary: You can browse, edit, or delete a utility options set.

» Important Recommendation:

BMC Software recommends that you establish utility option values for the system before you specify utility option values for a group.

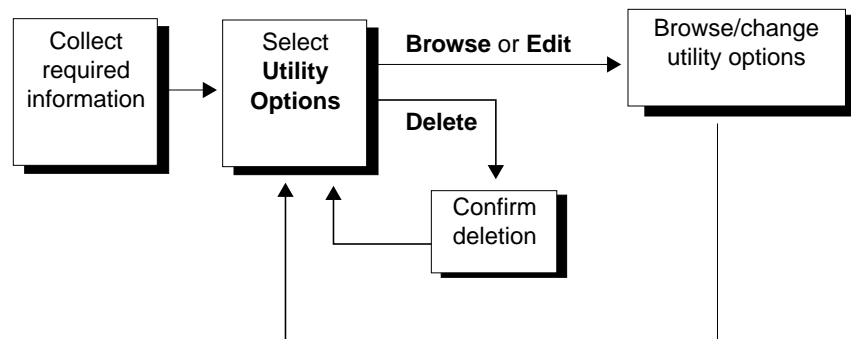


Figure 4-2 Changing Group Utility Options

Before You Begin

To perform this procedure, you need the following:

- these authorizations if you are not the creator of the utility options set:
 - **All** if you intend to save the group
 - **Open** if you do not intend to save the group
 - **All** on the utility options if you plan to update them
 - **Open** on the utility options
- information specific to the task:
 - the backup and recovery utility you will use
 - the backup and recovery options you will use

To Browse, Edit, or Delete a Utility Options Set

Begin this procedure at the Utility Options Maintenance panel. You can reach it in two ways:

- Select **Utility Options** from the Main Menu.
- Select **Group Edit** from the Data Set List panel for a group, then select **Utility Options** from the Group Edit panel.

Step 1 Type the utility options set name or wildcard pattern in the **Name or pattern** field, then press **Enter**.

Note: See “Defining Groups in RECOVERY MANAGER” on page 3-5 for a list of acceptable wildcard characters.

Step 2 Type one of the following Action codes in the **Act** field beside a utility options set, then press **Enter** to continue.

- Type **B** or **/** in the **Act** field to browse the set.

The Browse Utility Options Specification panel appears. You can view all utility options specified in the selected utility options set.

Note: Options shown in browse mode show all settings *in effect* at that level. This includes options specified within this utility options set, as well as any defaults from the system-wide utility options set and the product defaults. To see only those options that have been specified within the current utility options set, select edit mode.

- Type **E** in the **Act** field to edit the set.

The Update Utility Options Specification panel appears.

- Type **D** in the **Act** field to delete the set. You will be asked to confirm your delete request.

Note: You can delete the connection between a utility options set and an application group without deleting the entire utility options set. (See “Deleting a Utility Options Connection From a Group” on page 4-46). You can check to see which application groups will be affected by a deletion by using the **Groups referencing** option. See “Groups Referencing a Utility Options Set” on page 4-47 for more information.

- Step 3** Select a utility option type and press **Enter**. The Option Specification panel for that utility appears. Make your changes, then press **Enter** to return to the Update Utility Options Specification panel.
- Step 4** Repeat Step 3 for each of the option types for which you want to browse or edit, then press **F3**.

If you made changes, the Utility Options Save Confirmation panel appears. You can choose to:

- Save your updates to the repository—select **Save**.
- Create a new options set—select **SaveAs**.
- Cancel the changes and return to the Utility Options Maintenance panel—select **Exit**.
- Cancel the save and return to Step 3—select **Cancel**.
- Save the new options set you have created as the default options set—select **SetDefault**.

The new set is saved as `$$$$BMC.DEFAULT_OPTIONS`.

Note: The system-wide default set of utility options is automatically named `$$$$BMC.DEFAULT_OPTIONS`. It must be saved under this name in order for RECOVERY MANAGER to recognize it as the system-wide default set. You can save another utility options set with this name in order to designate it as the system-wide default set.

In addition to the system-wide default set of utility options that you create, RECOVERY MANAGER for OS/390 ships with a predefined set of product default utility options named `$$$$BMC.TEMPLATE_OPTIONS`. You can copy this file for use as a template when creating other utility options sets, but you cannot edit or delete it.

Selecting a Utility Options Set

Summary: You can select a utility options set and associate it with the current application group, or select a set and save it as your organization's system-wide default options.

Start this procedure at the Data Set List panel, which is displayed after you have performed either of the following tasks:

- created a new application group interactively (see “Using Interactive Methods” on page 3-3 or “Building a New Group” on page 3-20)
- retrieved a saved group (see “Saving, Retrieving, and Merging Groups” on page 3-25)

Step 1 Select **Group edit**, then press **Enter**.

The Group Edit panel appears.

Step 2 Select **Utility options**, then press **Enter**.

The Group Utility Options Selection panel appears.

Step 3 Type an options set name or wildcard pattern in the **Name or pattern** field, then press **Enter**.

A list of all saved utility options sets matching your entry appears.

Step 4 Type an **S** in the **Act** field beside the utility options set you want to select, then press **Enter**.

The Group Utility Option Maintenance panel appears.

Step 5 From the Group Utility Option Maintenance panel, perform one or more of the following:

- Browse utility options assigned to the group
 1. Select **Browse** and then press **Enter**. The Browse Utility Options Specification panel appears.
 2. Select an option type and press **Enter** to view those options settings for the selected application group. The Browse Options Specification panel for the utility option you chose appears.

3. Press **Enter** or **F3** to return to the Browse Utility Options Specification panel, where you can choose another option type.
 4. Press **F3** to return to the Group Edit panel.
- Edit one or more utility options settings for this application group
 1. Select **Edit** and then press **Enter**. The Update Utility Options Specification panel appears.
 2. Select an option type and press **Enter**. The Update Utility Options Specification panel for the option you selected appears.
 3. Make changes to those options for the application group.
 4. Press **F3** to return to the Update Utility Options Specification panel and select another option type.
 5. Continue with Step 6.
 - Select different options from the option list
 1. Choose **Select** and then press **Enter**. The Group Utility Options Selection panel appears.
 2. Return to Step 3.
 - Return to the Group Edit panel—press **F3**.

Step 6 After making your changes, you can perform one of the following:

- cancel your entries in the Update Utility Options Specification panel and return to the Group Edit panel—press **F3**.
- accept your entries—press **F3**. The Utility Options Save Confirmation panel appears. You can then choose from the following options:
 - save the current options set and associate it with the selected group—select **Save**
 - create a new options set and associate it with the current group—select **SaveAs**
 - make the current options set the default set for your organization—select **SetDefault**
 - cancel the changes and return to the Group Edit panel—select **Exit**

Deleting a Utility Options Connection From a Group

Summary: You can delete the connection between an application group and a utility options set without deleting the utility options set itself.

Step 1 From the Main Menu, select **Application groups**.

The Application Group List panel is displayed.

Step 2 In the Application Group List panel, enter a group name or pattern and press **Enter**. Type **S** beside a group to select it and press **Enter**.

The Data Set List panel is displayed.

Step 3 Select **Group Edit** and press **Enter**.

The Group Edit panel is displayed.

Step 4 Select **Utility Options** and press **Enter**.

The Group Utility Option Maintenance panel is displayed.

Step 5 Select **Delete** to remove the connection between the utility options set and the application group.

Groups Referencing a Utility Options Set

Summary: You can view all the application groups that reference a selected utility options set.

Begin this procedure at the Utility Options Maintenance panel. You can reach it in two ways:

- Select **Utility Options** from the Main Menu.
- Select **Group Edit** from the Data Set List panel for a group, then select **Utility Options** from the Group Edit panel.

Step 1 Enter a utility options set name or wildcard pattern in the **Name or pattern** field.

Note: See “Defining Groups in RECOVERY MANAGER” on page 3-5 for a list of acceptable wildcard characters.

Step 2 Type **G** in the **Act** field beside the options set you want to view, then press **Enter**.

A list of all application groups referencing the options set is displayed.

Chapter 5 Backing Up and Recovering Groups

This chapter describes the methods for generating backup and recovery jobs. It includes both online and batch job generation.

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When You Use the Procedures in This Chapter

Unless otherwise stated, start all the interactive procedures provided in this chapter at the RECOVERY MANAGER Main Menu. If you are already in a RECOVERY MANAGER session, press **F3** until that menu appears. Otherwise, use the method normally employed at your site to access the Main Menu.

While you are performing a procedure, you can access panel help by pressing **F1**. If you receive an error message, correct the problem before proceeding. For an explanation of a short message, press **F1** twice. For more information about a long message, follow the instructions on the panel to select that message.

Choosing a Method for Job Generation

You can choose to generate backup or recovery JCL (Job Control Language) interactively using the RECOVERY MANAGER online interface or in batch using the RECOVERY MANAGER program MRMBGEN.

- Using the interactive method, you can generate backup or recovery JCL starting at either the **Application Groups** or **Appl. Group Definition** items on the Main Menu. Before generating recovery JCL, you can specify recovery points, recovery options at the group level, revalidate the current group, and specify alternate recovery points for individual objects when necessary. Apart from providing a job statement for the generated job, you are not required to code any JCL.

See “Generating JCL for a Backup” on page 5-6, “Generating JCL for a Recovery to a Point in Time” on page 5-12 and “Generating JCL for Recovery to a Specific Backup” on page 5-15 for specific procedures.

- You can implement the batch method in one of these ways:
 - Use the online support provided by RECOVERY MANAGER to automatically create an MRMBGEN batch job to create a recovery job. This approach is only available for recovery, and requires only a short TSO session.
 - Code JCL to run the MRMBGEN batch job, which then creates a backup or recovery job. This method completely avoids using a TSO session.

You cannot change the values of backup or recovery options when you use the batch method. The values used in the job are those in effect for the target group when the MRMBGEN job runs.

In addition to releasing the RECOVERY MANAGER online interface for other work, MRMBGEN provides better automation for point-in-time recovery following an application failure and more support for disaster recovery preparation. It also supports coordinated recovery management.

See “Batch Recovery Job Generation” on page 5-19 for more information.

Backup Registration

RECOVERY MANAGER uses the Recovery Assets Catalog (RASCAT) as the primary location to register backups. It always looks for backups in RASCAT when auditing recovery resources, reporting recovery resources, or preparing for recovery.

Additionally, RECOVERY MANAGER has an API (application program interface) to the RUV™ repository so that it has access to backups and archives registered with RUV. The load module that delivers the API is RUVZAPI, which is delivered with the RUV product install. The load module must be accessible to RECOVERY MANAGER in order for RECOVERY MANAGER to identify RUV backups and archives. The value for VRULOAD is initially set during RECOVERY MANAGER installation, and it can be modified at any time through the RECOVERY MANAGER online interface using the Control Information panel. RECOVERY MANAGER attempts to access the RUV repository if there is a value for VRULOAD in the control information. If the RECOVERY MANAGER group is defined as associated with an ABARS aggregate, RECOVERY MANAGER automatically retrieves backups from the ABARS backup control data set.

RECOVERY MANAGER automatically retrieves information on HSM backups via standard IBM interfaces. No special registration is required.

RECOVERY MANAGER registers backups in RASCAT in the following ways:

- When DFDSS is selected as the backup utility, RECOVERY MANAGER supplies the MRMDSSU program and generates the necessary backup JCL for running MRMDSSU. MRMDSSU has specific DD requirements to recognize the backup data sets and associate them with the source data sets being backed up. This program establishes a user exit for DFDSS and invokes ADRDSSU to perform the backup. It allows RECOVERY MANAGER to monitor data sets that have been backed up and registers the backups in RASCAT upon successful completion.
- If the backup utility selected is XBM™ with SCV™ (EXTENDED BUFFER MANAGER for CICS with SNAPSHOT COPY for VSAM), RECOVERY MANAGER provides the registration load module MRMLREG. When the RMREGISTER(YES) option is used with SCV, it attempts to register its backups through the API provided by MRMLREG.

- ABARS and RUV manage their own backup registration in their product repositories. No special RECOVERY MANAGER process is needed or invoked at backup time. Therefore, RECOVERY MANAGER does not generate any special JCL or step related to backup registration for those utilities. Refer to the appropriate documentation for more information on the process.
- If the backup utility is RAMAC SnapShot, IDCAMS REPRO, or FDR, RECOVERY MANAGER uses its program MRMBREG to register the backup information in a conditional step following the backup. RECOVERY MANAGER generates the MRMBREG step in the backup JCL when these utilities are used.
- MRMBREG can be used to manually register backups. It can be added as a step in a backup process as long as it is used with one of the utilities supported by RECOVERY MANAGER. However, BMC Software recommends that you allow RECOVERY MANAGER to generate the backup JCL for you either online or through the MRMBGEN program in batch.

Online Backup Job Generation

After you have identified the objects you want to back up and the options you want to use for backup and recovery, you can generate backup JCL. You can then submit the JCL for execution or save it for later scheduling.

When you specify a backup job for one or more groups, you must supply the data set name where the output JCL is to be placed and the job card information for that JCL. Both items can include symbolic variables. For more information, see “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36.

Additionally, backup JCL can be generated in batch using the MRMBGEN program.

Generating JCL for a Backup

Summary: You can generate a backup job for a group.

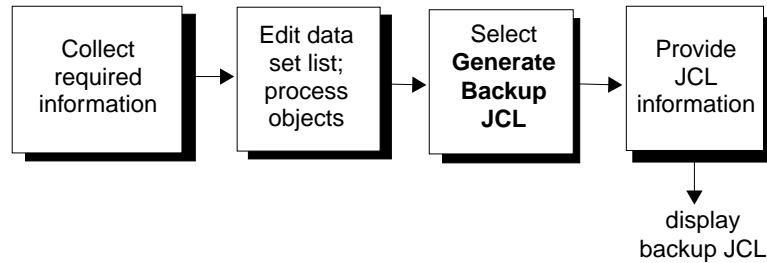


Figure 5-1 Generating JCL for Backup

Before You Begin

To perform this procedure, you need the following authorizations if you are not the creator of the group:

- **All** on the group and **Alter** on the repository if you intend to save changes to the group
- **Open** on the group and **Read** on the repository if you do not intend to save changes to the group
- authority to update the output data set for the JCL
- **Read** on control information
- **Open** for the group's utility options set if the group has assigned utility options

To Generate a Backup Job

Begin this procedure at the Data Set List panel, which appears after you have performed one of the following tasks:

- created a new group (see “Working with Objects and Groups” on page 3-3)
- retrieved a saved group (see “Processing Groups and Data Sets” on page 3-16)
- changed group backup options (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)
- revalidated the group online (see “Revalidating the Current Group” on page 3-44)
- revalidate the group (see “Group Revalidation and Reporting” on page 3-42)

Step 1 In the Data Set List panel for the current group, select **Gen Backup JCL**, and then press **Enter**.

JCL is generated for all objects with an acceptable (OK) status. *Objects with any other status are not included in the backup JCL.* For information about the types of object statuses, see *Table 3-6, “Object Status Types,”* on page 3-41.

If the group contains a GDG (generation data group) base, RECOVERY MANAGER includes any generations not already backed up in the backup JCL.

Step 2 When the JCL Specification panel appears, follow the instructions displayed.

Note: Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.
- Depending on the number of objects to be backed up, generating the JCL may take a noticeable length of time.

Press **Enter** to display the backup JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 3 Save the JCL data set or submit the job.

See “Submitting Your Backup or Recovery Job” on page 5-38 for items to consider before submitting the JCL for execution.

Online Recovery Job Generation

You can generate the recovery JCL entirely interactively. To specify a recovery job for one or more groups, you must, at a minimum, supply a recovery point and values for some related options. You can accept defaults for all of these variables. You must also supply the name of the data set where the output JCL is to be placed and the job card information for that JCL (see “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36).

Select the type of recovery for the group or groups you specify. The following types of recovery are available when you use RECOVERY MANAGER to generate a recovery job for a group:

- recovery to a point in time (use this option for recovery to current)
- recovery to a specified backup
- recovery to a coordinated recovery point

Other recovery options are accessible from the Group Edit panel. See “Group Utility Options” on page 3-34 for detailed information. Unless you plan to accept the current recovery option values, you must change them before you generate the recovery JCL.

Recovery Type Selection Options

You can select from the following recovery types when you specify a recovery job interactively. After you make your selections, the panel displays the option to generate recovery in the foreground.

- **Recover to a Point in Time**

Select this option to recover to a specified date and time. Type the date and time in the format displayed on the panel.

Note: RECOVERY MANAGER recovers the data sets to the closest available point at or before the time you specify.

- **Recover to Backup**

Select this option when you want to recover to a specified backup. Identify the backup by specifying a number from 0 to 99 in the **Backup minus** field. 0 represents the most recent backup and 99 represents the 99th backup prior to the most recent one.

»Important Recommendation

Data sets belonging to more than one group may have been backed up more recently than the backup you specify. For example, group rdarxs.group1 contains data sets A, B, and C, and it is backed up nightly. Data set C also belongs to group mharxs.group2, which is backed up each morning. Backup minus 0 for data sets A and B is the one made last night. Backup minus 0 for data set C is the one made this morning. In such a situation, recovering to backup minus 0 provides different results for data set C than it does for data sets A and B.

Warning! Unless you are certain that all data sets in the group were last backed up at the same time, you should recover to the latest backup (minus 0) or to a point in time.

- **Forward recover**

If you are using RECOVERY UTILITY for VSAM (RUV™), you can perform either a forward or backward recovery. The default is **Yes**. Select **No** to specify a backward recovery. This option applies only when you are using RUV.

- **To new volser(s)**

This option applies only when you are using DFDSS. Specify up to 16 volumes as targets for the recovery.

Generate Recover JCL in the Foreground

After you have selected a recovery type (point in time or to a specified backup) you can generate JCL. Enter a data set name for the output. If the output data set is partitioned, include the member name. You have the option of replacing an existing data set or member. Otherwise RECOVERY MANAGER displays a warning message that the data set or member already exists. You must supply a job statement for the JCL.

Generate Recover JCL in the Background

Use this option to generate recovery JCL in the background. On the Batch Group JCL Generation Options panel, select one of the following recovery points.

Recover to Current

This is the default recovery point. All available objects are recovered as close to the current date and time as possible.

Recover to Point in Time

Use this option to recover to a specified date and time. Enter the date and time in the format displayed on the panel.

Note: RECOVERY MANAGER recovers the data sets to the closest available point at or before that time.

Recover to Backup

Use this option when you want to recover to a specific backup. You identify the backup by specifying a number from 0 to 99, where 0 represents the most recent backup and 99 represents the 99th previous backup. See “Recovery Type Selection Options” on page 5-9 for important information about this topic.

Warning! Specifying a backup earlier than minus 0 could result in an inconsistent recovery. Be certain that the backup you specify is consistent for all data sets in the group; otherwise, consider recovering to the latest backup (minus 0) or to a point in time. See “Recovery Type Selection Options” on page 5-9 for more information about this option.

Recover to CRR Point

Use this option to recover to the most recent coordinated recovery point. These points are created and registered by the CRM.

Warning! RECOVERY MANAGER recovers the data sets to the closest available point at or before that time.

You must also:

- Specify a site type—either local (the default) or recovery (offsite).

» Important Recommendation

*When you specify RECOVERY, the backup data sets chosen match the pattern currently set in the **Offsite data set pattern** field in your General Utility Options. See “General Utility Options” on page 4-6 for more information about this setting.*

- Enter a DD statement for the output recovery JCL. It must be a complete data definition, including the member name if the data set is partitioned

Generating JCL for a Recovery to a Point in Time

Summary: You can specify a recovery to a point in time for a group, including the current time, and validate each object for the planned recovery. RECOVERY MANAGER recovers the data sets to the closest available point at or before the specified date and time.

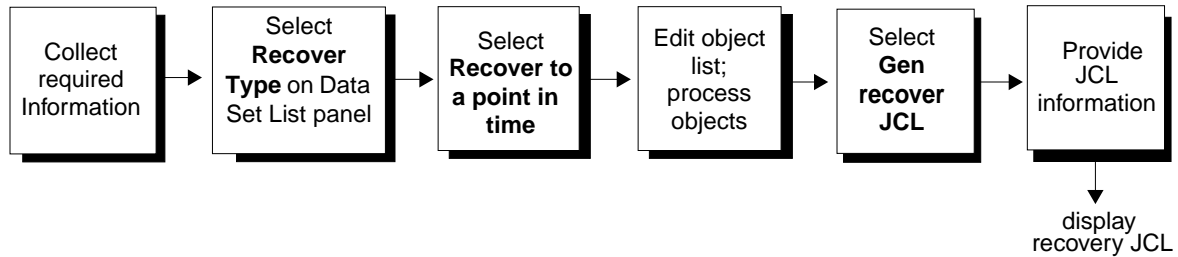


Figure 5-2 Generating JCL for Recovery to a Point in Time

Before You Begin

To perform this procedure, you need the following authorizations if you are not the creator of the group:

- **Open** to view the group or **All** to update the group
- **Alter** for the repository if you intend to save changes to the group
- **Read** for the repository if you do not intend to save changes
- authority to update the output data set for the JCL
- **Read** for RASCAT
- **Read** for control information
- **Open** on utility options referenced by the group

To Specify a Recovery to a Point in Time

Start this procedure at the Data Set List panel, which appears after you have performed one of the following tasks:

- created a new group (see “Building a New Group” on page 3-20)
- retrieved a saved group (see “Retrieving and Processing Saved Groups” on page 3-27)
- changed group recovery options (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)
- revalidated the group online (see “Revalidating the Current Group” on page 3-44)

Step 1 In the Data Set List panel for the current group, select **Recovery Type** and press **Enter**.

The Recovery Type Selection panel appears.

Step 2 In the Recovery Type Selection panel, select **Point in Time**. Specify the date and time and any other options on the panel, or accept the defaults, then press **Enter**.

The Data Set List panel appears.

Step 3 In the Data Set List panel, process individual objects.

See “Actions on Single Objects After Recovery Type Selection” on page 5-18 for more information.

The **Stat** column shows the status of each data set. See Table 3-6 on page 3-41 for information about the status of a data set.

Step 4 From the Data Set List panel for the current group, you can also perform the following:

- generate recovery JCL for the group. Continue with Step 5.
- exit or save the group to the repository for later processing

Press **F3** to display the Group Save Confirmation panel. Follow the instructions on the panel and select **Save**, **SaveAs**, **Exit**, or **Cancel**, as required.

Note: If you save the group under a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters.

- revalidate the group (see “Revalidating the Current Group” on page 3-44)
- change group recovery options (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)

Step 5 In the Data Set List panel for the current group, select **Gen recover JCL foreground**, and then press **Enter**.

The JCL Specification panel appears.

Step 6 Follow the instructions displayed on the JCL Specification panel.

RECOVERY MANAGER generates JCL for all objects with a status of OK. *Objects with any other status are not included in the recovery JCL.*

Note: Be aware of the following:

- If you use a partitioned data set to save the JCL, it must be cataloged.
- Depending on the number of objects to be recovered, generating the JCL may take a noticeable length of time.

Press **Enter** to display the recovery JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 7 Save the JCL data set or submit the job as required.

See “RECOVERY MANAGER Authorizations” on page 2-11 for information to consider before submitting the JCL to run.

Generating JCL for Recovery to a Specific Backup

Summary: You can specify a partial recovery to a specified backup ranging from the most recent (0) to the 99th previous backup (99).

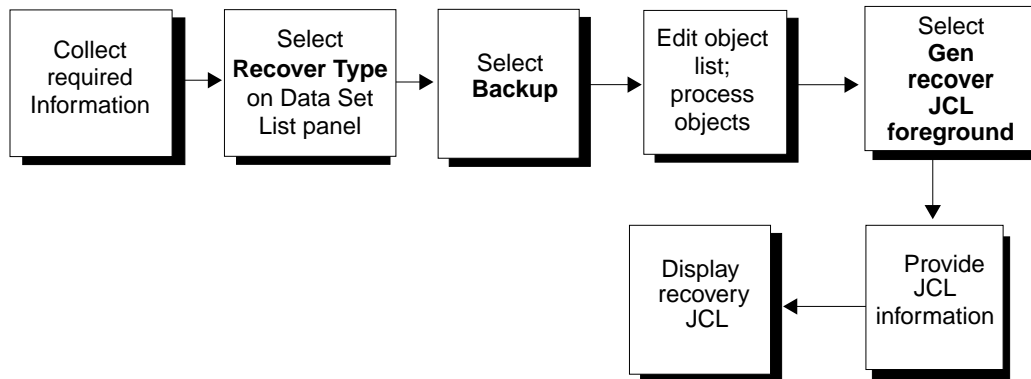


Figure 5-3 Generating JCL to a Specified Backup

Before You Begin

To perform this procedure you need the following authorizations if you are not the creator of the group:

- **Open** to view the group or **All** authority to update the group
- **Alter** for the repository if you intend to save changes to the group
- **Read** for the repository if you do not intend to save changes to the group
- authority to update the output data set for the JCL
- **Read** for RASCAT
- **Read** for control information
- **Open** on the utility options referenced by the group

To Select a Backup for Recovery

Use the following procedure to select a specific backup to use for recovering and application group or groups.

Note: Specifying a backup earlier than minus 0 could result in an inconsistent recovery. Be certain that the backup you specify is consistent for all data sets in the group; otherwise, consider recovering to the latest backup (minus 0) or to a point in time. See “Recovery Type Selection Options” on page 5-9 for more information about this type of recovery.

Start this procedure at the Data Set List panel, which appears after you have performed one of these tasks:

- created a new group (see “Building a New Group” on page 3-20)
- retrieved a saved group (see “Retrieving and Processing Saved Groups” on page 3-27)
- changed group recovery options (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)
- revalidated the group (see “Revalidating the Current Group” on page 3-44)

Step 1 In the Data Set List panel for the current group, select **Recovery Type** and press **Enter**.

The Recovery Type Selection panel appears.

Step 2 In the Recovery Type Selection panel, select **Backup** and enter the **Backup minus** value you desire (**0** for the most recent backup), then press **Enter**. The Data Set List panel appears.

Step 3 Process individual objects as needed.

See “Actions on Single Objects After Recovery Type Selection” on page 5-18 for more information.

Step 4 From the Data Set List panel for the current group, you can perform the following:

- generate recovery JCL for the group. Continue with Step 5.
- exit or save the group to the repository for later processing

Press **F3** to display the Group Save Confirmation panel. Follow the instructions on the panel and select **Save**, **SaveAs**, **Exit**, or **Cancel**, as required.

Note: If you save the group under a new name, the name must be in the form *creator.name*. The first part of the name cannot exceed 8 characters; the second part cannot exceed 18 characters.

- revalidate the group (see “Revalidating the Current Group” on page 3-44)
- change group recovery options (see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41)

Step 5 In the Data Set List panel for the current group, select **Gen recover JCL foreground**, and then press **Enter**.

The JCL Specification panel appears.

Step 6 Follow the instructions displayed on the JCL Specification panel.

RECOVERY MANAGER generates JCL for all objects with a status of OK. *Objects with any other status are not included in the recovery JCL.*

Note: Be aware of the following:

- If you use a partitioned data set to save the JCL, it must be cataloged.
- The job statement and other JCL used to prefix the recovery JCL *must* contain a symbolic variable for the job number.

See “Output Data Sets, Job Cards, and Symbolic Variables” on page 5-36 for more information.

- Depending on the number of objects to be recovered, generating the JCL may take a noticeable length of time.

Press **Enter** to display the recovery JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate recovery JCL.

Step 7 Save the JCL data set or submit the job as required.

See “RECOVERY MANAGER Authorizations” on page 2-11 for items to consider before submitting the JCL for execution.

Actions on Single Objects After Recovery Type Selection

After you have selected a recovery type (point in time or specific backup) for the current group, you can perform actions on individual data sets *currently included in the group*. In the Data Set List panel you can:

- Use action code **D** to display information about the selected recovery point for the data set.
- Use action code **L** to display a list of backups and archives for the data set, and then optionally select a different one for its recovery point.
- Use action code **T** to perform an IDCAMS LISTCAT and display the current attributes of the data set.
- Use action code **X** to exclude an object from further processing (also available in the Data Set List panel before recovery point selection).

Object Status After Recovery Point Selection

Unrecoverable object statuses that RECOVERY MANAGER can return are shown in Table 3-6 on page 3-41. In some cases, you can recover such objects in a separate recovery. In other cases you can recover such objects by using an alternate recovery point or by regenerating the object list. However, it is also possible that there is no valid recovery point for the object.

Batch Backup Job Generation

Use RECOVERY MANAGER's MRMBGEN batch program to generate backup JCL for one or more groups. This feature provides the following:

- support for coordinated backups
- reduced demands on TSO sessions by performing backup analysis off-line

Note: RECOVERY MANAGER provides no online support for batch backups.

When you use MRMBGEN to generate backup JCL, you cannot specify the values of backup options. The option values used in the backup job are those in effect for the target groups when the MRMBGEN job executes. The backups created are always current copies of the target data sets.

Using MRMBGEN to create a backup job completely avoids using a TSO session. Using this approach, you can use the MRMBGEN command procedure provided with RECOVERY MANAGER. This command procedure can be found in the RECOVERY MANAGER control data set. You can also use a wildcard pattern to specify multiple groups.

Batch Recovery Job Generation

Use RECOVERY MANAGER's MRMBGEN batch program to generate recovery JCL for one or more groups for a number of different recovery scenarios. This feature provides the following:

- support for coordinated recoveries
- better automation for point-in-time recovery after an application failure
- increased support for disaster recovery planning
- reduced demands on TSO sessions by performing recovery analysis off-line

When you use MRMBGEN, you can specify the recovery point for one or more groups. The following types of recovery points are available:

- recovery to a point in time (including current)
- recovery to a specified backup
- recovery to a coordinated recovery (CRR) disaster recovery point

You can also specify whether you are creating the recovery JCL to run at the local site or at a recovery site. You can use the batch program in the following ways:

- You can use online support provided by RECOVERY MANAGER to automatically create MRMBGEN JCL that you can execute to generate a recovery job. This approach requires only a short TSO session. However, all groups specified in the recovery must have the same type of recovery point. See “Generating an MRMBGEN Job Interactively” on page 5-21 for more information.
- You can code JCL to run MRMBGEN to create a recovery job. This completely avoids using a TSO session. With this approach, you can use the MRMBGEN command procedure provided with RECOVERY MANAGER. This command procedure can be found in the RECOVERY MANAGER control data set. You can also perform the following:
 - use a wildcard pattern to specify multiple groups
 - specify a different type of recovery point for each group or group pattern you specify

You cannot specify the values of recovery options when you use MRMBGEN. The option values used in the recovery job are those in effect for the target groups when the MRMBGEN job executes.

Generating an MRMBGEN Job Interactively

Summary: RECOVERY MANAGER provides online support for creating batch recovery jobs using MRMBGEN. Specify batch JCL generation from the Application Group List panel or Data Set List panel, and then proceed to specify the recovery point and job information.

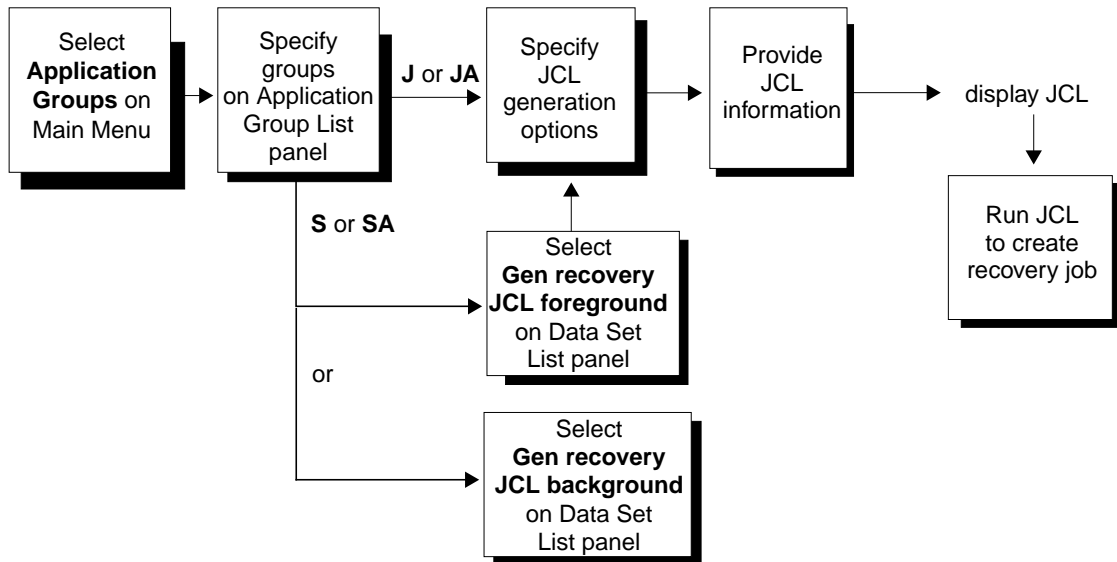


Figure 5-4 Batch Group JCL Generation

Before You Begin

You must have the following authorizations:

- **Read** for the repository, RASCAT, and control information
- **Open** for the group
- **Open** on any referenced utility options

To Generate a Recovery Job Using MRMBGEN

Start this procedure at either the Application Group List panel (begin at Step 1) or the Data Set List panel (begin at Step 2).

Note: To generate JCL for multiple groups, make your selections in the Application Group List panel.

Step 1 From the Application Group List panel, follow these steps:

1. Type a wildcard pattern or the name of a group in the **Name or pattern field**. Use the format *creator.group*.
2. Select **Replace** in the **GROUP list disposition** field.
3. In the **Act (Action)** column, type **J** (generate JCL for selected groups) or **JA** (generate JCL for all groups) to specify one or more groups for processing.
4. Press **Enter**.

The Batch Group JCL Generation Options panel appears. Continue with Step 3.

Step 2 From the Data Set List panel, select the **Gen recovery JCL background** option, then press **Enter**.

The Batch Group JCL Generation Options panel appears.

Note: If this is a new group or one that contains unsaved changes, the Group Save Confirmation panel appears. Follow the instructions displayed until the Batch Group JCL Generation Options panel appears.

Step 3 From the Batch Group JCL Generation Options panel, follow these steps:

1. Select a recovery type and provide the appropriate information.

Warning! Specifying a backup earlier than minus 0 could result in an inconsistent recovery. Be certain that the backup you specify is consistent for all data sets in the group; otherwise, consider recovering to the latest backup (minus 0) or to a point in time. See “Recovery Type Selection Options” on page 5-9 for more information about this option.

2. Select the site type where the generated recovery JCL will be run.

»»Important Recommendation

*When you specify RECOVERY, the backup data sets chosen match the pattern currently set in the **Offsite data set pattern** field in your **General Utility Options**. See “**General Utility Options**” on page 4-6 for more information.*

3. Provide a DD statement for the batch JCL output or accept the default.
4. Press **Enter**.

The JCL Specification panel appears

- Step 4** On the JCL Specification panel, follow the instructions displayed to create the JCL.

Note: Be aware of the following:

- The output data set must be cataloged.
- Depending on the number of objects to be backed up, generating the JCL may take a noticeable length of time.

Press **Enter** to display the recovery JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate recovery JCL.

- Step 5** Save the JCL data set or submit the job as required. See “**Submitting Your Backup or Recovery Job**” on page 5-38 for items to consider before submitting the JCL for execution.

MRMBGEN Options and JCL Variables

The descriptions for MRMBGEN syntax and options in this section are provided in the following ways:

- as online responses, used when you build the MRMBGEN job interactively through RECOVERY MANAGER. See “Generating an MRMBGEN Job Interactively” on page 5-21.
- as JCL variables (keywords, DD statements, and so on) when you build your own MRMBGEN job and incorporate the MRMBGEN command procedure

MRMBGEN syntax, as used in the JCL, is shown in Figure 5-5. Syntax descriptions can be found on the pages shown in italics by each option. Examples of input-set control statements are provided in “Examples of the MRMBGEN Control Input Data Set” on page 5-32.

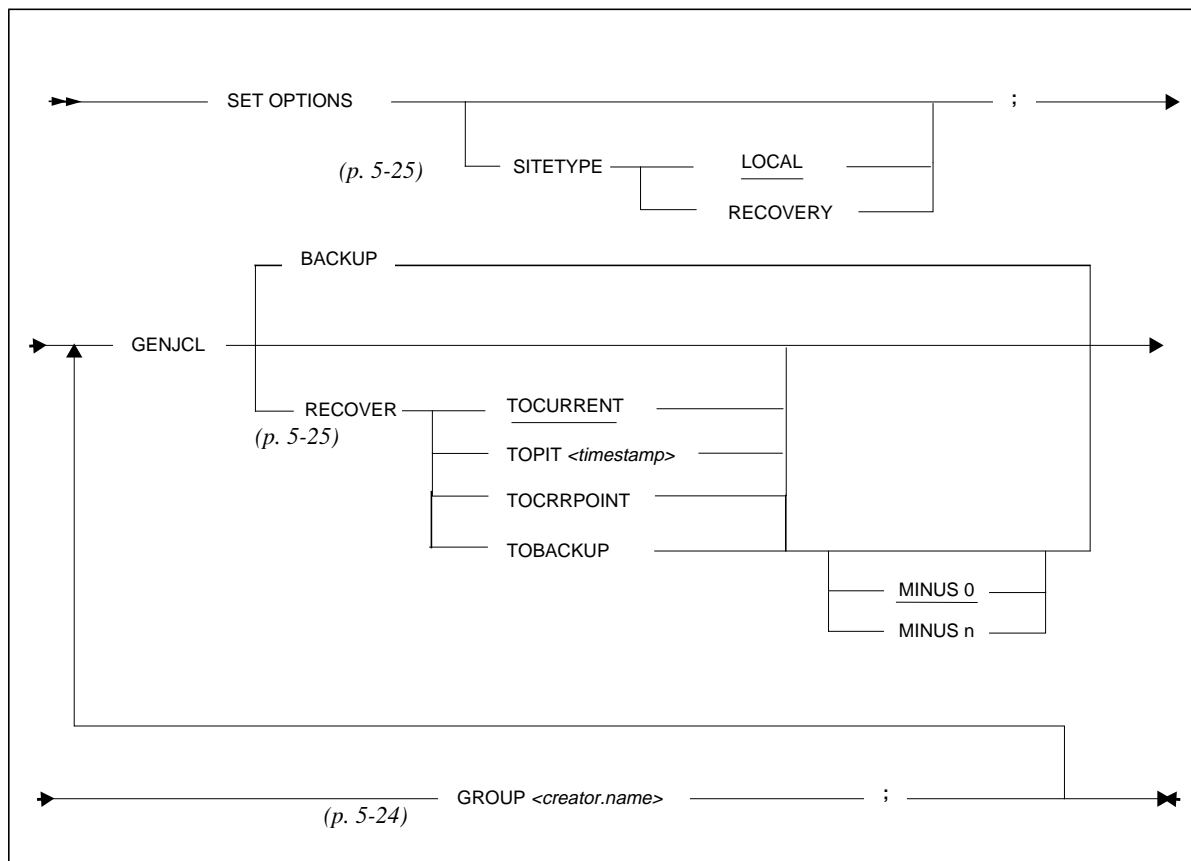


Figure 5-5 Batch JCL Generator Control Statement Syntax

SET OPTIONS SITETYPE Statement

When you create your own JCL, use the SITETYPE option to specify whether the JCL is to be run at the local site (the default) or at a recovery site (offsite).

» Important Recommendation

*This option determines which data sets are chosen as the input to the recover job step. When you specify RECOVERY, the backup data sets chosen match the pattern currently set in the **Offsite data set pattern** field in your General Utility Options. See “General Utility Options” on page 4-6 for more information about this setting.*

Online Response

RECOVERY MANAGER provides the SET OPTIONS keywords when you use this feature online. However, you must specify LOCAL when you want to generate recovery JCL for a potential local recovery. Specify RECOVERY when you want to generate recovery JCL for use at a disaster recovery site (offsite).

JCL Variable

In the control input data set, provide the keywords SET OPTIONS SITETYPE RECOVERY to specify a recovery site, as shown in the syntax diagram on page 5-24. *No statement is necessary to specify the local site.*

You can have multiple SET OPTIONS statements in the control data set.

GENJCL BACKUP GROUP *creator.name* Statement

When you create your own backup JCL, you must use the command GENJCL BACKUP and GROUP to prefix the group name. RECOVERY MANAGER provides these keywords when you use this feature online. You can have multiple such statements in the control data set.

GENJCL RECOVER *recovery_point* GROUP *creator.name* Statement

When you create your own recovery JCL, you must use the command GENJCL RECOVER to prefix the recovery type option and GROUP to prefix the group name. RECOVERY MANAGER provides these keywords when you use this feature online. You can have multiple such statements in the control data set.

The following sections describe proper specification of the various recovery types and the names of the target groups.

Recover to Current

This is the default recovery point. When you specify a recovery to the current time, the current time stamp is used to recover the data sets.

Online Response

Select **Current** at the **Recover to** prompt.

JCL Variable

In the control input data set, provide the keywords GENJCL RECOVER as shown in the syntax diagram in Figure 5-5 on page 5-24. The syntax defaults to TOCURRENT.

Recover to Point in Time

When you specify a recovery to a point in time, the specified time stamp is used to recover the data sets. RECOVERY MANAGER identifies a recovery point at or before the time specified.

Online Response

Select **Point in time** at the **Recover to** prompt and enter the point in time in YY-MM-DD HH-SS format (the default is the current date and time).

JCL Variable

In the control input data set, provide the keywords GENJCL RECOVER TOPIT as shown in the syntax diagram in Figure 5-5 on page 5-24. Specify the date and time you want after the keyword TOPIT.

Recover to Backup

Use this option to recover to a specific backup registered in RASCAT, RUV, HSM, or ABARS. Identify the backup by specifying a number from 0 through 99, where 0 represents the most recent backup made and 99 represents the 99th previous backup. RECOVERY MANAGER counts backups for the site type.

Warning! Specifying a backup earlier than minus 0 could result in an inconsistent recovery. Be certain that the backup you specify is consistent for all data sets in the group; otherwise, consider recovering to the latest backup (minus 0) or to a point in time. See “Recovery Type Selection Options” on page 5-9 for more information about this option.

Online Response

Select **Backup** at the **Recover to** prompt. Provide the number of the backup you want at the **Backup minus** prompt.

JCL Variable

In the control input data set, provide the keywords GENJCL RECOVER TOBACKUP as shown in the syntax diagram in Figure 5-5 on page 5-24. Specify the number of the backup you want by using the keyword MINUS *n* where *n* is that number. The default is MINUS 0, which is the most recent backup.

Recover to CRR Point

Use this option to recover to the most recent coordinated recovery point. These points are created and registered by the CRM.

»»Important Recommendation

When you specify RECOVERY, the backup data sets chosen match the pattern currently set in the Offsite data set pattern field in your General Utility Options. See “General Utility Options” on page 4-6 for more information about this setting.

Online Response

Select **CRR point** at the **Recover to** prompt. Select either **Local** or **Recovery** (offsite) as the site type.

JCL Variable

In the control input data set, provide the keywords GENJCL RECOVER TOCRRPOINT as shown in the syntax diagram in Figure 5-5 on page 5-24.

DD Statement for Batch JCL Output

Use this feature to specify a DD statement for the name of the output data set for the recovery JCL.

Online Response

Accept or edit the DD statement that is displayed. You can use up to three lines for this specification.

JCL Variable

Incorporate a DD statement in the JCL to specify the data set name, such as:

```
//SYSUT2 DD DISP=(NEW,CATLG,DELETE),DSN=RDARXS.TMP.JCL(BGENJCL)
```

MRMBGEN Sample Job and Output

MRMBGEN creates a JCL job that automatically gathers all the data needed to create batch recovery JCL from your selected application groups. In addition, MRMBGEN generates output files showing any data sets that are not available for recovery. Figure 5-6 shows a sample MRMBGEN job. Examples of output are shown in “Examples of MRMBGEN Output” on page 5-31. A sample of the batch recovery JCL is shown on page 5-34.

Sample MRMBGEN JCL

```

/* ***** */
/*          RECOVERY MANAGER - V1.2.00 - BMC SOFTWARE, INC.          */
/* ***** */
/*          CREATE TEMP DATA SET FOR FILE TAILORING                */
/* ***** */
//MRM0000 EXEC PGM=IEFBRL4
//TEMP      DD DISP=(MOD,DELETE),
//          DSN=RDAETB4.TMPISPF.D990311.T153102,
//          UNIT=SYSDA,SPACE=(CYL,(5,5)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS)
//MRM00001 EXEC PGM=IEBGENER
//SYSPRINT  DD SYSOUT=*
//SYSIN     DD DUMMY
//SYSUT1    DD DUMMY,
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS)
//SYSUT2    DD DISP=(NEW,CATLG,DELETE),
//          DSN=RDAETB4.TMPISPF.D990311.T153102,
//          UNIT=SYSDA,SPACE=(CYL,(5,5)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS)
/* ***** */
/*          BATCH JCL GENERATION                                    */
/*          FOR SELECTED GROUPS                                    */
/* ***** */
//MRM00002 EXEC PGM=IKJEFT1B,DYNAMNBR=250,
//          PARM='ISPSTART PGM(MRMBGEN) PARM()',
//          REGION=4M
//STEPLIB   DD DISP=SHR,DSN=BMCMMR.V120TEST.LOAD
//          DD DISP=SHR,DSN=BMCRECOVERY MANAGERV0.TEST.LOAD
//MRMLOAD   DD DISP=SHR,DSN=BMCMMR.V120TEST.LOAD
//MRMMSGS   DD DISP=SHR,DSN=ELS.V150TEST.CNTL(MRMMSGS)
//MRMOPTS   DD DISP=SHR,DSN=ELS.V150TEST.CNTL(MRM$OPTS)
//MRMPRINT  DD SYSOUT=*
//MRMERROR  DD SYSOUT=*
//BMCERROR  DD SYSOUT=*
//MRMIN     DD *
SET OPTIONS SITETYPE LOCAL ;
GENJCL
RECOVER
TOCURRENT
GROUP RDAETB4."MIXED" ;

```

(continued on next page)

```

/*
//ISPFIL  DD DISP=(MOD,KEEP),
//          DSN=RDAETB4.TMPISPF.D990311.T153102
//ISPSLIB DD DISP=SHR,DSN=BMCMRM.V120TEST.SLIB
//ISPTABL DD DISP=SHR,DSN=BMCMRM.V120TEST.SLIB
//ISPMLIB DD DISP=SHR,DSN=BMCMRM.V120TEST.SLIB
//ISPTLIB DD DISP=(,DELETE),UNIT=SYSDA,SPACE=(TRK,(1,1,2)),
//          DCB=BMCMRM.V120TEST.SLIB
//          DD DISP=SHR,DSN=BMCMRM.V120TEST.SLIB
//ISPLLIB DD DISP=(,DELETE),UNIT=SYSDA,SPACE=(TRK,(1,1,2)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PO)
//ISPPROF DD DISP=(,DELETE),UNIT=SYSDA,SPACE=(TRK,(1,1,2)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PO)
//ISPCTL0 DD DISP=(,DELETE),UNIT=SYSDA,SPACE=(CYL,(1,1)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS)
//ISPCTL1 DD DISP=(,DELETE),UNIT=SYSDA,SPACE=(CYL,(1,1)),
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS)
//ISPLOG  DD DISP=(,DELETE),UNIT=SYSDA,SPACE=(CYL,(1,1)),
//          DCB=(LRECL=125,RECFM=VBA,BLKSIZE=3000,DSORG=PS),
//          DSN=&&LOG
//SYSTSIN DD DUMMY
//SYSTSPRT DD SYSOUT=*
//SYSTEM  DD SYSOUT=*
//ISPLIST DD SYSOUT=*
/* ***** *//
//*          COPY TEMP DATA SET TO TARGET DATA SET          *//
/* ***** *//
//MRM0003 EXEC PGM=MRMBGMR,COND=(4,LT)
//STEPLIB DD DISP=SHR,DSN=BMCMRM.V120TEST.LOAD
//MRMMSGS DD DISP=SHR,DSN=ELS.V150TEST.CNTL(MRMMSGS)
//MRMPRINT DD SYSOUT=*
//MRMERROR DD SYSOUT=*
//BMCERROR DD SYSOUT=*
//SYSUT1  DD DISP=(OLD,DELETE,KEEP),
//          DSN=RDAETB4.TMPISPF.D990311.T153102,
//          DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS)
//SYSUT2  DD DSN=RDAETB.MRM.RSTRJCL(MIXED),DISP=(OLD,KEEP,KEEP)

```

Figure 5-6 The MRMBGEN Generated JCL

Examples of MRMBGEN Output

Two samples of MRMBGEN job output follow. Sample 1 is the result of running the job shown on Figure 5-6 on page 5-30. Sample 2 shows a situation where no backups could be found for some of the data sets requiring recovery, thus preventing the recovery of those data sets.

Sample 1

```
* RECOVERY MANAGER FOR OS/390 - BATCH JCL GENERATION 1.2.00 03/11/1999 15:32:26

SET OPTIONS SITETYPE LOCAL ;

BMC80570I COMMAND COMPLETE RC = 0

GENJCL
  RECOVER
    TOCURRENT
      GROUP RDAETB4."MIXED" ;
BMC80539W INFO      - PRECLUDES RECOVERING - RDAETB.QA.FILE01.BKUP

BMC80570I COMMAND COMPLETE RC = 0

BMC80571I PROGRAM COMPLETE RC = 0
```

Sample 2

```
*RECOVERY MANAGER FOR OS/390 - BATCH JCL GENERATION 1.2.00 03/11/1999 4:56:00

SET OPTIONS SITETYPE LOCAL ;

BMC80570I COMMAND COMPLETE RC = 0

GENJCL
  RECOVER
    TOPIT 1999-03-02-14.53.00
      GROUP RDAETB4."MIXED" ;
BMC80539W NOTAVAIL - PRECLUDES RECOVERING - BMCMRM.V120.CNTL
BMC80539W NOTAVAIL - PRECLUDES RECOVERING - RDAETB.MRM.BGPVJCL
BMC80539W INFO      - PRECLUDES RECOVERING - RDAETB.QA.FILE01.BKUP
BMC80539W NOTAVAIL - PRECLUDES RECOVERING - RDAETB.QA.FILE01.BKUP.G0009V00
BMC80539W NOTAVAIL - PRECLUDES RECOVERING - RDAETB.QA.MRME0010
BMC80539W NOTAVAIL - PRECLUDES RECOVERING - RDAETB.QA.MRMK0010
BMC80846W NOTHING TO RECOVER          NO OBJECTS HAVE STATUS OF "OK"

BMC80570I COMMAND COMPLETE RC = 4

BMC80571I PROGRAM COMPLETE RC = 4
```

Examples of the MRMBGEN Control Input Data Set

This section provides examples of the contents of the MRMIN control input information in different scenarios.

Single Group — Recover to Backup

The following syntax is for a recover to backup of the MVS data sets contained in the group RDARXS.GROUP. The most recent backup is specified, and the recovery is planned for the local site. Note the semicolon delimiter at the end of the command statement.

```
SET OPTIONS SITETYPE LOCAL ;
GENJCL
  RECOVER
    TOBACKUP MINUS 0
    GROUP "RDARXS"."GROUP" ;
```

Single Group — Backup

The following syntax is for a backup of the MVS data sets contained in the group RDARXS.GROUP. Note the semicolon delimiter at the end of the command statement.

```
SET OPTIONS SITETYPE LOCAL ;
GENJCL
  BACKUP
    GROUP "RDARXS"."GROUP" ;
```

Multiple Groups — Recover to Current (local site)

The following syntax is for a recover to current of the data sets contained in the three groups indicated. The recovery is for a local site.

```

SET OPTIONS SITETYPE LOCAL ;
GENJCL
    RECOVER
        TOCURRENT
            GROUP "RDARXS"."GROUP" ;
GENJCL
    RECOVER
        TOCURRENT
            GROUP "RDARXS"."GROUP1" ;
GENJCL
    RECOVER
        TOCURRENT
            GROUP "RDARXS"."GROUP2" ;

```

Multiple Groups — Backup (local site)

The following syntax is for a backup of the data sets contained in the three groups indicated. The backup is for a local site.

```

SET OPTIONS SITETYPE LOCAL ;
GENJCL
    BACKUP
        GROUP "RDARXS"."GROUP" ;
GENJCL
    BACKUP
        GROUP "RDARXS"."GROUP1" ;
GENJCL
    BACKUP
        GROUP "RDARXS"."GROUP2" ;

```

Multiple Groups — Recover to Current (recovery site)

The following example shows the syntax for recovering the same groups as in the previous example at a recovery site.

```
SET OPTIONS SITETYPE RECOVERY;
GENJCL
  RECOVER
    TOCURRENT
      GROUP "RDARXS"."GROUP" ;
GENJCL
  RECOVER
    TOCURRENT
      GROUP "RDARXS"."GROUP1" ;
GENJCL
  RECOVER
    TOCURRENT
      GROUP "RDARXS"."GROUP2" ;
```

Sample Recovery JCL

The following example shows the recovery JCL generated when the MRMBGEN JCL is run. Notice that DFDSS is used to restore non-VSAM data sets, while IDCAMS is used to restore VSAM data sets. These utilities were selected in the utility options set assigned to the application group or groups for which MRMBGEN was run.

```
/* ***** */
/*          RECOVERY MANAGER - V1.2.00 - BMC SOFTWARE, INC.          */
/* ***** */
/*          DFDSS - RESTORE                                          */
/*          SELECTED DATA SETS(S)                                  */
/* ***** */
/* ***** */
//MRM00001 EXEC PGM=ADRDSU,REGION=4M
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//INDD0000 DD DSN=RDACXR2.RDACXR2.TEST2.LP990304.T143622,
//          DISP=SHR
//INDD0001 DD DSN=RDAETB.MIXED.LD1BU.D990303.T140955,
//          DISP=SHR
//INDD0002 DD DSN=RDAETB.GDGBASE.LD1BU.D990903.T105140,
//          DISP=SHR
//SYSIN    DD *
```

(continued on next page)

```

RESTORE DATASET ( INCLUDE ( -
BMCMRM.V120.CNTL -
                ) ) -
    CATALOG -
    REPLACE -
    SPHERE -
    WAIT ( 2 , 2 ) -
    INDDNAME ( INDD0000 ) ;
RESTORE DATASET ( INCLUDE ( -
                                RDAETB.MRM.BGPVJCL -
                ) ) -
    CATALOG -
    REPLACE -
    SPHERE -
    WAIT ( 2 , 2 ) -
    INDDNAME ( INDD0001 ) ;
RESTORE DATASET ( INCLUDE ( -
                                RDAETB.QA.FILE01.BKUP.G0009V00 -
                ) ) -
    CATALOG -
    REPLACE -
    SPHERE -
    WAIT ( 2 , 2 ) -
    INDDNAME ( INDD0002 ) ;
/* ***** */
/* ***** */
/* RECOVERY MANAGER - V1.2.00 - BMC SOFTWARE, INC. */
/* ***** */
/* IDCAMS RESTORE */
/* SELECTED DATA SETS(S) */
/* ***** */
/* ***** */
//MRM00002 EXEC PGM=IDCAMS,REGION=4M,COND=(4,LT)
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
    REPRO IDS(RDAETB.QA.MRME0010.LD1BU.D990311.T091718) -
        ODS(RDAETB.QA.MRME0010)
    REPRO IDS(RDAETB.QA.MRMK0010.LD1BU.D990310.T144225) -
        ODS(RDAETB.QA.MRMK0010)

```

Using MRMBGEN in Disaster Recovery Planning

You can use MRMBGEN to provide more automation for the recovery of your applications in a disaster recovery situation. At the local site, you can generate application recovery JCL using MRMBGEN specifying **CRR Point** as the recovery type. MRMBGEN uses the time stamp stored by COORDINATED RECOVERY MANAGER (CRM) to generate ready-to-run application recovery jobs that you can transport to the recovery site. At the recovery site, you can execute the application recovery jobs. You can also recover to the last backup or to a time that you specify.

Using MRMBGEN in Coordinated Backup and Recovery

A CRM user can request that RECOVERY MANAGER generate recovery JCL for one or more specified RECOVERY MANAGER groups. RECOVERY MANAGER uses MRMBGEN to generate the recovery JCL and informs CRM of its location. Through CRM, you can request either of the following types of recovery:

- recovery to a CRM-generated recovery point
- recovery to a RECOVERY MANAGER identified recovery point

Any backups created are always current copies of the target data sets.

» Important Recommendation

Because CRM does not support delimited identifiers, BMC Software recommends that you use undelimited RECOVERY MANAGER names for any group that is a potential target in a coordinated recovery.

For CRM requests, MRMBGEN always generates local site JCL.

Output Data Sets, Job Cards, and Symbolic Variables

When you specify a backup or recovery job for one or more groups, you must supply the data set name where the output JCL is to be placed and for the job card information for that JCL. Both items can include symbolic variables.

When you do not supply your own job card information during backup or recovery job generation, RECOVERY MANAGER uses a default. You can view or update the default by selecting **Control Information** in the RECOVERY MANAGER Main Menu, and then selecting **MVS Resource Information**. You can also edit the default during job creation. The edited information then becomes the new default for your user ID.

The following sections describe the symbolic variables that are available for use.

Output Data Set (JCLOUT) Specification

The name of the data set where the JCL is to be placed must be the name of an existing data set. If the data set is partitioned, you must also include the member name. You can use the symbolic variables listed in Table 5-1 when you specify the data set name.

Table 5-1 JCLOUT Symbolic Variables

Symbol	Result ⁽¹⁾
&SSID:	The ID of the MVS system ⁽²⁾
&USERID, &UID:	Your TSO user ID
&SUID nm :	Substring of your user ID, starting with character n for a length of m characters
&#...&#####:	The COORDINATED RECOVERY MANAGER (CRM TM) request ID
&DATE:	The current date (in the form $yymdd$) ^(3,4)
&TIME:	The current time (in the form $hhmmss$) ^(3,4)

Notes:

1. The maximum total length allowed for a data set name is 44 bytes.
2. Intended for use with CRM to avoid naming collisions (see "Group Naming Considerations" on page 7-6)
3. Not recommended for use with CRM requests.
4. Symbols with a numeric result must be prefixed by at least one alphabetic character.

Job Card (JCARD) Specification

The job card information (JCARD1 through JCARD5) can include symbolic variables. The symbolic variables available to use in your job card specification are shown in the following table.

Table 5-2 JCARD Symbolic Variables

Symbol	Result
&SSID:	The ID of the MVS system ⁽¹⁾
&USERID, &UID:	Your TSO user ID
&SUID nm :	Substring of your user ID, starting with character n for a length of m characters
&#...&####:	Generated numeric digits
Notes: 1. Intended for use with CRM to avoid naming collisions (see "Group Naming Considerations" on page 7-6).	

Submitting Your Backup or Recovery Job

Consider the following before submitting a job generated by RECOVERY MANAGER:

- Are you fully authorized to use all the utilities needed for backup and recovery? See "Utility Authorizations" on page 2-20 and "Authorization to Change Control Information" on page 2-18 for authorizations you may need.
- If you are recovering from a volume failure, have you initialized the new volumes with the same name as the failed volumes? If not, you must modify the JCL to reflect the different names.

Preparing for Volume Recovery

If you are building a new group to perform a recovery after the failure of one or more volumes, BMC Software recommends these steps:

- Step 1** Use RECOVERY MANAGER to identify the objects on the failed volumes, then create a volume group. See “To Build a Volume Group” on page 3-23 for more information. Follow the instructions for Foreground execution.
- Step 2** Initialize new replacement volumes with the same names as the failed volumes.
- Note:** If you use a volume with a different name than that of the failed volume, you must edit the JCL generated in Step 3 before you attempt the recovery.
- Step 3** Use one of the procedures described in “Generating JCL for a Recovery to a Point in Time” on page 5-12 to specify the type of recovery and to generate recovery JCL.

Restarting a Failed Backup or Recovery Job

If a recovery job fails during execution, you can restart it at the failed job step. Add a `RESTART=<stepname>` option to the RECOVERY MANAGER JOB statement, where `<stepname>` is the name of the job step that failed during the prior execution.

Refer to the appropriate reference manual for more information about restarting an IBM or BMC Software utility.

Chapter 6 Managing System Resources

This chapter discusses the backup and recovery of system resources and includes the generation of the JCL required for those purposes. The system resources of RECOVERY MANAGER for OS/390 include the RECOVERY MANAGER repository, which stores all information related to application groups and utility options sets, the RECOVERY MANAGER Recovery Assets Catalog (RASCAT), which tracks backups, ICF catalog maintenance, and ICFRU forward recovery functions.

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Performing System Resource Recovery Procedures

Unless otherwise stated, start all the procedures provided in this chapter at the RECOVERY MANAGER Main Menu. If you are already in a RECOVERY MANAGER session, press **F3** until the Main Menu appears. Otherwise, use the method employed at your site to access the Main Menu.

While you are performing a procedure, you can access panel Help by pressing **F1**. If you receive an error message, correct the problem before proceeding. For an explanation of a short message, press **F1** twice. For more information about a long message, select that message in the panel displayed.

About System Resources

You can use RECOVERY MANAGER for OS/390 to automatically generate JCL to perform the following system resource backup, recovery, and maintenance tasks:

- back up and recover the RECOVERY MANAGER repository (see page 6-3)
- back up and recover the RECOVERY MANAGER Recovery Assets Catalog (RASCAT) (see page 6-7)
- synchronize the RECOVERY MANAGER repository (see page 6-13)
- synchronize the RECOVERY MANAGER RASCAT (see page 6-13)
- define and maintain ICF catalogs (see page 6-16)
- use automated ICFRU functions (see page 6-63)
- view system resource information (see page 6-68)

Access all repository backup and recovery options through the **System resources** option on the Main Menu.

The control file (.CNTL) contains sample recovery JCL (MRMRECVR) that you can use for recovering one repository from another, or for recovering one RASCAT from another.

RECOVERY MANAGER Repository

In the event of a failure involving the RECOVERY MANAGER repository (a set of VSAM KSDS data sets), you can continue to use RECOVERY MANAGER to create groups and generate backup and recovery JCL; *however, you cannot save group information or retrieve information already saved.* You should, therefore, be in a position to recover the repository quickly whenever the need arises and you should back up the repository data sets on a regular basis.

You can group and recover data sets in the RECOVERY MANAGER repository by specifying it in a data set list in the same way you group and back up or recover any other group of data sets. However, you can group the repository objects more efficiently by selecting the **RMGR Repository** item from the System Resource Backup, Recovery and Maintenance panel. This method automatically lists all the repository objects for you. You can then change backup or recovery options, select a recovery point, add objects to the group, exclude objects from the group, or generate backup or recovery JCL in the same way as with any other group of data sets.

The RECOVERY MANAGER repository contains the following information for each group:

- system recovery options
- system backup options
- group names and attributes
- group definitions
- group recovery options
- group backup options
- group authorizations
- objects in the group
- utility option definitions
- utility option authorizations

Use the procedure on the next page to create a group of repository data sets.

Backing Up or Recovering a Repository Group

Summary: This procedure describes creating a group containing all data sets in the RECOVERY MANAGER repository, and then generating backup or recovery JCL.

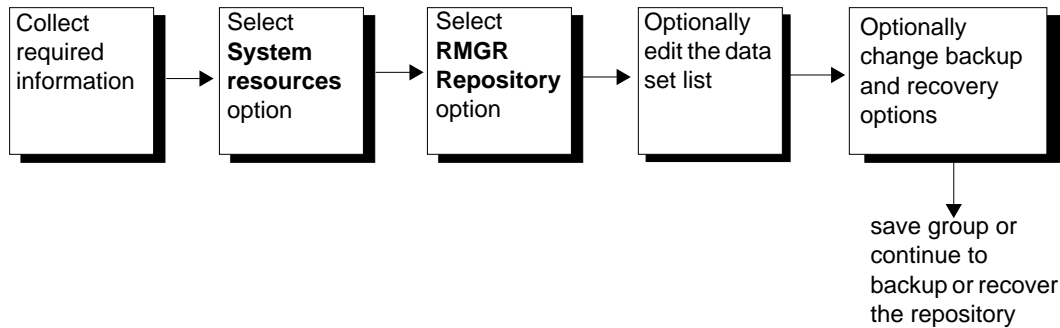


Figure 6-1 Backing Up and Recovering the RECOVERY MANAGER Repository

Before You Begin

To perform this procedure, you need the following authorizations:

- **Alter** on the repository if you plan to save it
- **Read** on control information, RASCAT, and the repository

To Create a RECOVERY MANAGER Repository Group

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** In the RECOVERY MANAGER Main Menu, select **System resources**, then perform the following steps:
1. Type the target BMC subsystem name for RUV, if RUV is installed.
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **RMGR Repository** to see a list of all the data sets in the RECOVERY MANAGER repository.

Step 3 If necessary, edit the list of objects included in the group. Use the following action codes:

- **Exclude (X)**—excludes one or more data sets from further processing. Type **X** in the **Act** column by the data set, then press **Enter**.
- **LISTCAT (T)**—performs an IDCAMS LISTCAT for the data set and displays the results. This allows you to view the current attributes of the data set. Type **T** in the **Act** column by the data set, then press **Enter**.

Step 4 Select **Group edit** to perform the following:

- change the utility options set assigned to the entire group—see “Browsing, Updating, or Deleting a Utility Options Set” on page 4-41
- revalidate the group—see “Group Revalidation and Reporting” on page 3-42
- update group authorizations—see “Group Authorizations” on page 3-35

Step 5 To generate a backup, select **Gen backup JCL**. Continue with backup preparations. See “Online Backup Job Generation” on page 5-5 for more information.

Step 6 To generate recovery JCL, select **Gen recover JCL**. Continue with recovery preparations. See “Generating JCL for a Recovery to a Point in Time” on page 5-12 or “Batch Recovery Job Generation” on page 5-19 for more information.

RECOVERY MANAGER Recovery Assets Catalog (RASCAT)

The RECOVERY MANAGER Recovery Assets Catalog (RASCAT) stores information pertaining to all known backups made by RECOVERY MANAGER, including the following:

- names of all data sets that were backed up
- names of backup data sets
- date/time stamps for the backup data sets
- utility used to make the backup

RECOVERY MANAGER locates the VSAM base names of the RASCAT data sets in the control information. It builds a temporary group for the data sets, then displays a special version of the Data Set List panel. This panel displays a limited list of options. The group is given a temporary set of utility options that take the product's defaults (except that the VSAM utility is set to DFDSS and SPHERE is set). RECOVERY MANAGER requires that DFDSS be used for backup if it is performing the automation. If you want to perform your own backup and recovery outside of RECOVERY MANAGER, you can select any utility.

If **Gen backup JCL** is selected, RECOVERY MANAGER enforces that at least one of the data set names for the backups named in the group's utility options match the prefixes identified in the control information under RASCATBK1 through RASCATBK4.

If **Gen recover JCL** is selected, RECOVERY MANAGER locates all data sets in the ICF catalog with prefixes matching the values in the control information for RASCATBK1 through RASCATBK4. It then displays these data sets in a list and allows you to select one to use for recovery. When recovery JCL is generated, the first copy of RASCAT is restored from the backup you selected. The second copy of RASCAT is recovered via IDCAMS REPRO from the first copy.

Backing Up RASCAT or Recovering RASCAT

Summary: These procedures describe generating backup or recovery JCL for RECOVERY MANAGER's RASCAT.

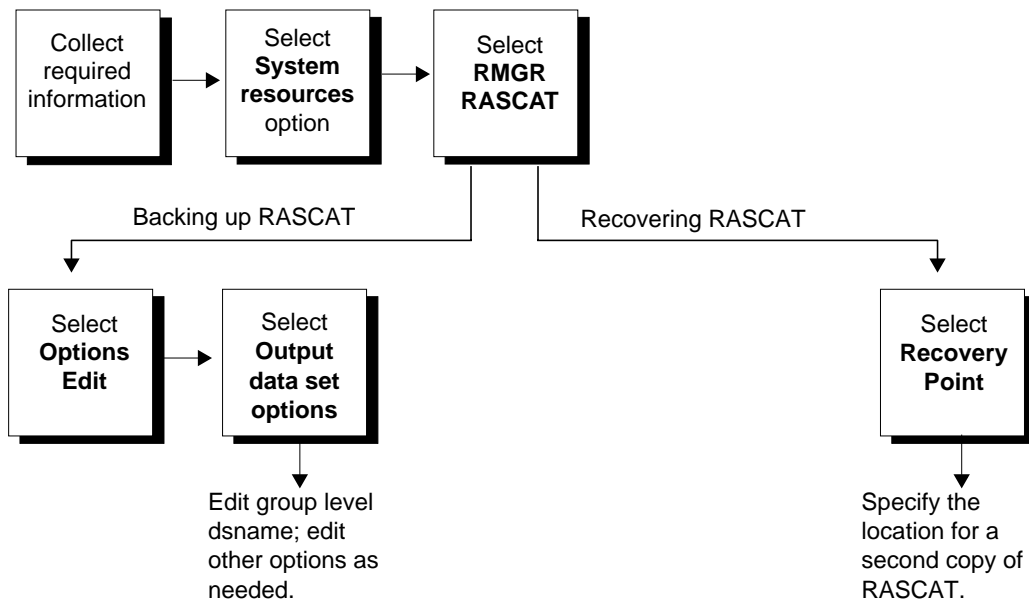


Figure 6-2 Backing Up or Recovering the RECOVERY MANAGER RASCAT

Before You Begin

To perform this procedure, you need the following:

- **Execute** authority for RECOVERY MANAGER
- authority to execute backup or recovery JCL

Backing Up RASCAT

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RUV product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **RMGR RASCAT** then press **Enter**. The RASCAT Backup and Recovery panel appears listing the RECOVERY MANAGER RASCAT data set.
- Step 3** You can use the following action codes with the data set:
- **Exclude (X)**—excludes the data set from further processing. Type **X** in the **Act** column by the data set, then press **Enter**.
 - **LISTCAT (T)**—performs an IDCAMS LISTCAT for the data set and displays the results. This allows you to view the current attributes of the data set. Type **T** in the **Act** column by the data set, then press **Enter**.
- Step 4** Select **Options edit** then press **Enter**. The Update Utility Options Specification panel appears.
- Step 5** Select **General utility options** then press **Enter**. The Update General Utility Options Specification panel appears.
- Step 6** Select DFDSS as both the non-VSAM and VSAM backup utility, then press **Enter** to return to the Update Utility Options Specification panel.
- Step 7** Select **Output data set options** then press **Enter**. The Update Output Data Set Options Specification panel appears.

- Step 8** On the Update Output Data Set Options Specification panel, perform the following:
- In the **Group level dsname** field, type a RASCAT backup data set name containing a RASCAT backup prefix.
- Note:** RASCAT backup prefixes are listed in **RMGR information** under **Control information** on the Main Menu.
- Complete other fields for copy 1 as needed.
 - Press **Enter** to display Output Data Set Options Specification panels for copy 2, copy 3, and copy 4. Completion of these panels is optional.
 - When you are finished with the output data set options, press **F3** until you return to the RASCAT Backup and Recovery panel.

Step 9 Select **Gen backup JCL**. The JCL Specification panel appears.

Step 10 Follow the instructions on the JCL Specification panel to generate backup JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the backup JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 11 Save the JCL data set or submit the job.

See “Submitting Your Backup or Recovery Job” on page 5-38 for items to consider before submitting the JCL for execution.

Recovering RASCAT

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **RMGR RASCAT** then press **Enter**. The RASCAT Backup and Recovery panel appears listing the RECOVERY MANAGER RASCAT data set.
- Step 3** You can use the following action codes on the data set:
- **Exclude (X)**—excludes the data set from further processing. Type **X** in the **Act** column by the data set, then press **Enter**.
 - **LISTCAT (T)**—performs an IDCAMS LISTCAT for the data set and displays the results. This allows you to view the current attributes of the data set. Type **T** in the **Act** column by the data set, then press **Enter**.
- Step 4** Select **Recovery point** then press **Enter**. The RASCAT Backup List panel appears listing RASCAT backups.
- Note:** To view detailed information about a backup, type a **D** in the Act (Action) field beside that backup. To return to the RASCAT Backup List panel, press **F3**.
- Step 5** Select the desired backup for the data set, then press **Enter**. The RASCAT Recovery - Copy 2 Allocation Specification panel appears.
- Step 6** Follow the instructions on the RASCAT Recovery - Copy 2 Allocation Specification panel. Complete the panel to specify where a second copy of RASCAT is to be allocated. Press **Enter** or **F3** to return to the RASCAT Backup and Recovery panel.
- Step 7** Select **Gen recover JCL** then press **Enter**. The JCL Specification panel appears.

Step 8 Follow the instructions on the JCL Specification panel to generate recovery JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the recovery JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 9 Save the JCL data set or submit the job.

See “Submitting Your Backup or Recovery Job” on page 5-38 for items to consider before submitting the JCL for execution.

Synchronizing the RECOVERY MANAGER Repository or RASCAT

RECOVERY MANAGER provides two copies of the repository files and two copies of the RASCAT files. Events such as a program ABEND can cause the two copies to become out of sync. When you synchronize the files, you select one copy to use as the master. The other file is replaced with the master.

To ensure that the files are identical and that the most current copy is available should a recovery become necessary, you should periodically verify that the files are synchronized. Accomplish this by comparing the files using the sample job MRMCOMPR provided in the RECOVERY MANAGER .CNTL data set. This job uses IEBCOMPR to compare the files. Use the results of the job to identify discrepancies between the copies and determine which of the two is the most accurate and up to date.

Synchronizing the Repository Files or RASCAT Files

Summary: These procedures describe generating JCL to synchronize the RECOVERY MANAGER repository files or RASCAT files.

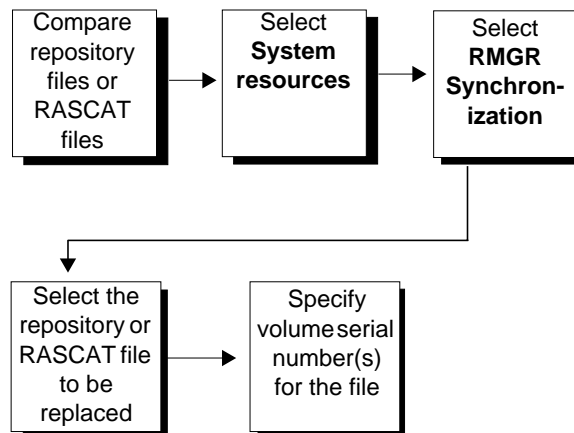


Figure 6-3 Synchronizing the Repository or RASCAT

Before You Begin

To perform this procedure, you need the following:

- **Execute** authority for RECOVERY MANAGER
- authority to execute backup or recovery JCL
- authority to delete and define the requested file (RASCAT or repository)
- authority to delete and define on the specified disk volumes

Synchronizing the Repository or RASCAT

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **RMGR Synchronization**, then press **Enter**. The Synchronize RASCAT and/or Repository Files panel appears.
- Step 3** Select a RASCAT file or a repository file to be replaced.
- Step 4** Specify one to three volume serial numbers on which the file is to be defined, then press **Enter**. The JCL Specification panel appears.
- Step 5** Follow the instructions on the JCL Specification panel to generate JCL to synchronize the two copies of the repository or RASCAT. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 6** Save the JCL data set or submit the job.

ICF Catalog Maintenance

RECOVERY MANAGER automates the most common Integrated Catalog Facility (ICF) maintenance tasks. Each of these tasks and the associated fields and options are described in the following sections.

For more information about these procedures, see IBM's *DFSMS/MVS Access Method Services for ICF* and *DFSMS/MVS Managing Catalogs*.

Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries

You can select from the options listed below to accomplish ICF catalog maintenance tasks. RECOVERY MANAGER generates the appropriate JCL.

Warning! Table 6-1 lists exceptions to the standard return codes that RECOVERY MANAGER uses with Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries functions.

Resetting these return codes allows the job to complete (for example, defining aliases), but still alerts you to a possible error condition. Investigate non-zero return codes.

1. **Define Catalog**—performs DEFINE CATALOG and optional UNLOCK
2. **Change Catalog**—changes the size of a basic catalog structure (BCS) or changes attributes that cannot be changed using ALTER; generates the following JCL steps:
 - LOCK
 - EXPORT
 - DELETE existing catalog
 - DEFINE same catalog
 - IMPORT
 - UNLOCK (optional)
3. **Move Catalog**—moves a catalog to a different volume; generates the following JCL steps:
 - LOCK
 - EXPORT
 - IMPORT
 - UNLOCK (optional)

4. **Rename Catalog**—changes the name of an existing catalog; generates the following JCL steps:
 - LOCK
 - DEFINE new catalog
 - REPRO NOMERGE CAT
 - DELETE catalog to be renamed
 - DEFINE aliases (all aliases that were associated with the deleted catalog)
 - UNLOCK (optional)
5. **Split Catalog**—divides a large catalog into two catalogs; generates the following JCL steps:
 - LOCK
 - DEFINE new catalog
 - LISTCAT
 - REPRO MERGE CAT
 - DELETE aliases
 - DEFINE aliases
 - UNLOCK (optional)
6. **Merge Catalogs**—combines two small catalogs (moves one entire catalog into the other); generates the following JCL steps:
 - LOCK
 - LISTCAT
 - REPRO MERGE CAT
 - DELETE aliases
 - DEFINE aliases
 - DELETE obsolete catalog
 - UNLOCK (optional)
7. **Move Entries**—moves entries from one catalog into another existing catalog; generates the following JCL steps:
 - LOCK
 - LISTCAT
 - REPRO MERGE CAT
 - DELETE aliases
 - DEFINE aliases
 - DELETE obsolete catalog
 - UNLOCK (optional)

Table 6-1 Exceptions to Completion Status Return Codes

Standard Return Code	RECOVERY MANAGER Exception
0	0 (no change)
4	4 (no change)
8	5
12	6
16	7

Table 6-2 lists the available fields and options on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel, along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-2 Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options

Field or Option	IBM Keyword	Default Value	See Page
Existing Catalog Name	n/a	n/a	6-18
New/Target Catalog Name	n/a	n/a	6-19
Model Catalog	MODEL	n/a	6-19
Export/Import Dataset	n/a/INDATASET	n/a	6-19
Unit	UNIT	n/a	6-19
Space in cylinders	SPACE	n/a	6-19
Blksize	BLKSIZE	2048	6-19
Retention period	RETPD	n/a	6-19
Expiration date	EXPDT	n/a	6-19
Master Catalog Name	CATALOG	n/a	6-19
Catalog(s) Status at EOJ	LOCK/UNLOCK	1 (Lock)	6-19

Field or Option Descriptions:

Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Panel

Existing Catalog Name

Type the name of an existing catalog. This is a required field for all options except **Define Catalog**.

New/Target Catalog Name

Type the name of the new catalog you want to create during the **Define**, **Rename**, or **Split** processes, or the existing target catalog for the **Merge** and **Move Entries** processes. This field is required for these processes.

Model Catalog

In this field, type the name of an existing catalog that you want to use as a model for a new catalog. The attributes of the existing catalog are copied to the new catalog unless you specify different attributes. This field is optional.

Export/Import Dataset

Type the name of a new data set to which you want to export an existing catalog, and which you will then import from when loading a catalog. This field is required when you choose the **Change Catalog** or **Move Catalog** options.

Unit

Type the storage unit for the exported data set, for example, SYSALLDA. This is a required field.

Space in cylinders

Type the number of cylinders to be allocated for the exported catalog. This field applies to DASD only.

Blksize

Type the block size for the data set. The minimum size allowed is 512, and the maximum is 32760. This is a required field.

Retention period

Type the retention period for the data set using a number of days in the range of 1-999. This field and **Expiration date** are mutually exclusive.

Expiration date

Type the expiration date for the data set using the form YYDDD or YYYY/DDD. This field and **Retention period** are mutually exclusive.

Master Catalog Name

Type the name of the master catalog.

Catalog(s) Status at EOJ

Locking the catalog restricts catalog access to authorized personnel until an explicit UNLOCK is performed. Type **1** if you want the catalogs to remain locked at the end of the job. Catalogs will be locked in the first step of jobs. Type **2** if you want the catalogs to be unlocked at the end of the job. The default is **1** (Lock). This is a required field.

Note: It might be helpful to lock a new, moved, merged, or split catalog until you are ready to use it. At that time, request an unlock.

Table 6-3 lists the available fields and options on the Catalog Definition/Allocation Options panel, along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-3 Catalog Definition/Allocation Options

Field or Option	IBM Keyword	Default Value	See Page
Volume	VOLUME	none	6-20
Allocation	CYL, TRK, KB, MB	none	6-20
Primary	n/a	none	6-20
Secondary	n/a	none	6-21
Freespace CI	FREESPACE	none	6-21
Freespace CA	FREESPACE	none	6-21
Writecheck	WRITECHECK/ NOWRITECHECK	2 (No)	6-21
Bufferspace	BUFFERSPACE	none	6-21
BUFND	BUFND	none	6-21
BUFNI	BUFNI	none	6-21
DataClass	DATACLASS	none	6-21
MgtClass	MANAGEMENTCLASS	none	6-21
StorClass	STORAGECLASS	none	6-21
STRNO	STRNO	3	6-22
Shropt/reg	SHAREOPTIONS (crossregion)	3	6-22
Shropt/sys	SHAREOPTIONS (crossregion)	4	6-22
Replicate	REPLICATE/NOREPLICATE	2 (No)	6-22
Imbed	IMBED/NOIMBED	2 (No)	6-22

Field or Option Descriptions: Catalog Definition/Allocation Panel

Volume When defining or moving a catalog, you must specify the volume on which you want to place it. This field is required when you use Define Catalog, Change Catalog, Move Catalog, Rename Catalog or Split Catalog. There is no default.

Allocation You can specify space for the catalog in tracks (**TRK**), cylinders (**CYL**), kilobytes (**KB**), or megabytes (**MB**). This field is required for the Define Catalog, Change Catalog, Rename Catalog, and Split Catalog options. There is no default.

Primary Type the number of units of primary space you want to allocate for the catalog. This field is required for the Define Catalog, Change Catalog, Rename Catalog, and Split Catalog options. There is no default.

Secondary	Type the number of units of additional space you want to allocate for the catalog when primary space is full. This field is required for the Define Catalog, Change Catalog, Rename Catalog, and Split Catalog options. There is no default.
Freespace (CI)	Use this option to specify the amount of space that is to be left free when the catalog is loaded and after any control intervals are split. Type a percentage value from 0 through 100 in this field. If you leave this field blank, freespace is not altered. This field is required when you enter a value in the Freespace (CA) field.
Freespace (CA)	Use this option to specify the amount of space that is to be left free when the catalog is loaded and after any control areas are split. Type a percentage of 0-100 in this field. If you leave this field blank, free space is not altered. This field is required when you enter a value in the Freespace (CI) field.
Writecheck	Type 1 (Yes) if you want the catalog to be checked by a direct access device operation called writecheck when a record is written to the device. Type 2 (No) if you do not want this operation to be performed. The default is No .
Bufferspace	VSAM determines the required buffer space for catalogs. You only need to specify this if you want to determine buffer space for your catalog. Type a numeric value between 512 and 16,776,704. There is no default.
BUFND	Use this field to specify the number of buffers for transmitting data between virtual and auxiliary storage. Type a numeric value between 3 and 255. There is no default.
BUFNI	Specify the number of buffers for transmitting the contents of index entries between virtual and auxiliary storage. Type a numeric value between 3 and 255. There is no default.
DataClass	Allocation and space attributes can be defined by the storage administrator, then used to create a catalog. If you want to use an existing data class in the definition of your catalog, type its name in this field. There is no default.
MgtClass	You can define a management class for your catalogs and other system data sets, defining an appropriate backup frequency. The system then creates backups of the catalog according to your management policy. If you want to use an existing management class for the catalog you are creating, type its name in this field. There is no default.
StorClass	Your storage administrator can define a collection of storage attributes that identify performance goals and availability requirements. If you want to assign an existing storage class to the catalog you are creating, type its name in this field. There is no default.

STRNO	This attribute specifies the number of concurrent read requests for a catalog. Type a number from 2 to 255 in this field. The default is 3.
Shropt/reg	<p>Use this option to specify the amount of sharing allowed among regions within the same system or within multiple systems using global resource serialization (GRS). Type 3 to allow the catalog to be fully shared by multiple users. Each user who opens the catalog as a data set must maintain both read and write integrity for the data accessed by the program.</p> <p>Warning! User programs that ignore the write integrity guidelines can cause VSAM program checks, lost or inaccessible records, uncorrectable catalog errors, and other unpredictable results. Therefore, each user sharing the catalog must use it with caution.</p>
Shropt/sys	<p>Type 3 to specify that the catalog can be fully shared.</p> <p>Typing a value of 3 in both the Shropt/reg field and the Shropt/sys field directs the catalog open process to unconditionally bypass the setting of the buffer invalidation indicator. So, even though the catalog resided on a shared DASD device, buffer invalidation would not occur.</p> <p>Note: Select this performance option only when you are certain that the catalog is not being shared across multiple processors.</p> <p>Type 4 to specify that the catalog can be fully shared. Buffers used for direct processing are refreshed for each request.</p>
Replicate	Type 1 (Yes) in this field if you want each index record to be written on a track as many times as it fits. Type 2 (No) if you do not want index records to be replicated. The default is No .
Imbed	Type 1 (Yes) if you want sequence set records to be replicated (written on a track as many times as needed to fill the track), regardless of the setting for Replicate . One track of each control area is used for sequence set records. Type 2 (No) if you do not want the sequence set records to be replicated. The default is No .

Field or Option Descriptions: Level Specification Panel

Use this space to specify the levels of data set names you want to process when you use the **Split Catalog** or **Move Entries** options. These levels establish which data sets are moved. An alias is defined for the target catalog for each level you specify.

Note: You cannot select a generic (*) level name.

Warning! Do not specify a level that has more qualifiers than is allowed for alias level qualifiers (specified within the SYSCAT parm). Doing so will make the data sets inaccessible.

RECOVERY MANAGER uses this information

- to move data sets from an old catalog to a new catalog
- delete aliases from an old catalog
- define aliases to a new catalog

Specify more levels

If you have filled all the lines and want to type more levels, type **Y** in this field, then press **Enter** to display additional space.

Create Alternate Master Catalog

The master catalog is critical to the MVS system. If the regular master catalog becomes damaged, you can use an alternate master catalog in a system initial program load (IPL). After the IPL, the original master catalog can be repaired or recovered. The system can again be IPLed with the original recovered master catalog.

RECOVERY MANAGER automates the process of creating an alternate master catalog and guides you through the process.

Warning! The job generated by RECOVERY MANAGER creates a *new* master catalog and sets the *current* master catalog as the alternate. The related VSAM volume data sets (VVDS) are changed to point to the new master catalog.

Table 6-4 Create Alternate Master Catalog Options

Field or Option	IBM Keyword	Default Value	See Page
Current master catalog	n/a	n/a	6-24
Volser	n/a	n/a	6-24
New master catalog	n/a	n/a	6-24
Volser	n/a	n/a	6-24
Allocation	n/a	n/a	6-24
Primary	n/a	n/a	6-24
Secondary	n/a	n/a	6-24
Update master cat name	n/a	n/a	6-24

Table 6-4 Create Alternate Master Catalog Options

Field or Option	IBM Keyword	Default Value	See Page
SYSn.IPLPARM	n/a	n/a	6-24
Current suffix	n/a	n/a	6-25
Alternate suffix	n/a	n/a	6-25

Field and Option Descriptions

Current Master Catalog

Type the name of the current master catalog for which you want to create an alternate. This is a required field.

Volser

Type the volume serial for the current master catalog. This is a required field.

New Master Catalog

Type the name for the new master catalog you want to create. This is a required field.

Volser

Type the volume serial for the new master catalog. It must be different than that of the current master catalog. This is a required field.

Allocation

Type the unit type to be used for space allocated for the new master catalog. This is a required field. The options are

- **TRK**—track
- **CYL**—cylinder
- **KB**—kilobyte
- **MB**—megabyte

Primary

Type the amount of space to allocate for the new master catalog when it is created. This is a required field.

Secondary

Type the amount of additional space to be allocated for the catalog when primary space is full. This is a required field.

Update master cat name

Type **1** to update the master catalog name within SYSn.IPLPARM (LOADxx). Type **2** to update the master catalog name within SYS1.PARMLIB (LOADxx). Type **3** to update the master catalog name within SYS1.NUCLEUS (SYSCATxx). This is a required field.

SYSn.IPLPARM

If your master catalog name is stored in the SYSn.IPLPARM(LOADxx) member, you must type a numeric value between 0 and 9 to replace the “n” of the data set name. This member contains information that identifies the master catalog to MVS.

Current suffix

Type a two character suffix to replace the “xx” of the member name that currently contains the master catalog information. After you submit the JCL, this member is updated to contain the new master catalog name. This is a required field.

Alternate Suffix

Type two characters to replace "xx" of the LOAD or SYSCAT member name. After you submit the JCL, this member contains an exact copy of your LOAD or SYSCAT member as it was before any changes. It contains the old master catalog name. This is a required field.

Alter Catalog Attributes

Your needs for a catalog can change over time, making it necessary to change the catalog attributes. RECOVERY MANAGER automates the process of altering catalog attributes.

After running the generated JCL to alter a catalog’s attributes, manually close the catalog with MODIFY CATALOG,CLOSE. Doing so refreshes the catalog address space (CAS) control blocks for the catalog.

Note: To change catalog attributes not listed here, select the **Change Catalog** option on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Table 6-5 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-5 Alter Catalog Attributes Options

Field or Option	IBM Keyword	Default Value	See Page
Catalog Name	n/a	n/a	6-26
Data Component	n/a	n/a	6-26
Bufferspace	BUFFERSPACE	n/a	6-26
BUFND	BUFND	n/a	6-26
Freespace (CI)	FREESPACE	n/a	6-26
Freespace (CA)	FREESPACE	n/a	6-26
Lock	LOCK/UNLOCK	n/a	6-27
ManagementClass	MANAGEMENTCLASS	n/a	6-27

Table 6-5 Alter Catalog Attributes Options

Field or Option	IBM Keyword	Default Value	See Page
Shareoptions (crossregion)	SHAREOPTIONS	n/a	6-27
Shareoptions (crosssystem)	SHAREOPTIONS	n/a	6-27
StorageClass	STORAGECLASS	n/a	6-27
STRNO	STRNO	n/a	6-27
Index Component	n/a	n/a	6-28
BUFNI	BUFNI	n/a	6-28

Field and Option Descriptions

Catalog Name Type the catalog's cluster name when it differs from the data component name or index component name. This is a required field.

Data Component Type the data component (cluster or data) that you want to change. This is a required field when you are altering one or more of the catalog's data component attributes.

Note: You get a second Alter statement if you specify both a **Data Component** and an **Index Component**.

Bufferspace This option specifies the amount of space for buffers. VSAM uses this information to determine the size of the control interval for the data component and the index component. Type a value in the range of 512 through 16,776,704. This is a required field.

BUFND This option specifies the number of buffers for transmitting data between virtual and auxiliary storage. When a catalog contains large generation data groups (GDGs) or other spanned records, the number should be increased accordingly. Type a value between 3 and 255.

Freespace (CI) Use this option to specify the amount of space that is to be left free when the catalog is loaded and after any control intervals are split. Type a percentage value from 0 through 100 in this field. If you leave this field blank, freespace is not altered. This field is required when you enter a value in the **Freespace (CA)** field.

Freespace (CA) Use this option to specify the amount of space that is to be left free when the catalog is loaded and after any control areas are split. Type a percentage of 0-100 in this field. If you leave this field blank, free space is not altered. This field is required when you enter a value in the **Freespace (CI)** field.

- Lock** Use this option to restrict access to the ICF catalog to authorized personnel. Generally, ICF catalogs are only locked during catalog recovery operations. To lock the catalog, type **1** in this field. Type **2** in the field to unlock the catalog.
- ManagementClass** This option applies to SMS-managed data sets. The storage administrator defines management classes that can be used at your facility. Type the name of a management class (1-8 characters) in this field.
- Shareoptions (crossregion)**
Use this option to specify the amount of sharing allowed among regions within the same system or within multiple systems using global resource serialization (GRS). Type **3** to allow the catalog to be fully shared by multiple users. Each user who opens the catalog as a data set must maintain both read and write integrity for the data accessed by the program.
- Warning!** User programs that ignore the write integrity guidelines can cause VSAM program checks, lost or inaccessible records, uncorrectable catalog errors, and other unpredictable results. Therefore, each user sharing the catalog must use it with caution.
- Shareoptions (crosssystem)**
Type **3** to specify that the catalog can be fully shared.
- Typing a value of **3** in both the **Shareoptions (crossregion)** field and the **Shareoptions (crosssystem)** field directs the catalog open process to unconditionally bypass the setting of the buffer invalidation indicator. So, even though the catalog resided on a shared DASD device, buffer invalidation would not occur.
- Note:** Select this performance option only when you are certain that the catalog is not being shared across multiple processors.
- Type **4** to specify that the catalog can be fully shared. Buffers used for direct processing are refreshed for each request.
- StorageClass** This option applies to SMS-managed data sets. Your storage administrator can define storage classes for use at your facility. Storage class specifies the storage service level to be used by SMS for storage of the catalog. Type the name of the storage class in this field (1-8 characters).
- STRNO** Use this field to indicate the number of concurrent catalog positioning requests that VSAM should manage. This parameter alters the data component of an integrated catalog facility catalog. Type a value from **2** through **255**.

Index Component Type the index component of the catalog named in the first field. This field is required when you use the **BUFNI** option.

Note: You get a second Alter statement if you specify both a **Data Component** and an **Index Component**.

BUFNI This option specifies the number of buffers for transmitting index entries between virtual and auxiliary storage. If the catalog index exceeds 3 levels of index, the minimum BUFNI equals the number of levels of index - 1 + STRNO. Type a numeric value between 3 and 255.

Define Alias, VVDS

RECOVERY MANAGER automates the processes of defining aliases for a user catalog and defining VSAM volume data sets (VVDS).

Defining an Alias

To use a catalog, the system must be able to determine which data sets should reside in that catalog. An easy way to accomplish this is to define aliases relating to the catalog. However, carefully consider the effect the new alias will have on old data sets. An alias that is poorly chosen could make some data sets inaccessible.

Field and Option Descriptions

Define Alias To define an alias, type **1** in the option field, then complete the associated fields described below.

Alias Name Type the name of the alias you want to define. This is a required field.

Note: You cannot define an alias if a data set cataloged in the master catalog has the same high-level qualifier as the alias.

Relate to Catalog Type the catalog for which you are defining an alias. This is a required field.

Define in Catalog Type the name of the master catalog in which you want to define the alias. The master catalog limits the number of aliases a catalog can have. This is a required field.

Defining a VVDS

Defining a VSAM volume data set (VVDS) in this way is appropriate when you are initializing a new volume.

Field and Option Descriptions

- Define VVDS** To define a VVDS, type **2** in the option field, then complete the associated fields described below.
- A VVDS is defined with the name SYS1.VVDS.Vvolser, where volser is the volume serial number of the volume containing the VVDS. SYS1.VVDS.Vvolser does not have to be cataloged in the master catalog.
- VVDS on Volume** Type the volume serial number of the volume for which you are creating the VVDS. This is a required field.
- Allocation** Type one of the following allocation types. This is a required field.
- **TRK**—tracks
 - **CYL**—cylinders
 - **KB**—kilobytes
 - **MB**—megabytes
- Primary** Type the number of units of primary space to be allocated for this VVDS. This is a required field.
- Secondary** Type the number of units of secondary space to be allocated for this VVDS. This is a required field.

Export/Import Catalog

RECOVERY MANAGER automates the process of exporting or importing an ICF catalog.

Table 6-6 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-6 Export/Import Catalog Options

Field or Option	IBM Keyword	Default Value	See Page
Export from Catalog	ENTRYNAME	n/a	6-30
Export Outdataset	OUTFILE	n/a	6-30
Unit	UNIT	n/a	6-30
Space in cylinders	n/a	n/a	6-30
Blksize	BLKSIZE	2048	6-30

Table 6-6 Export/Import Catalog Options

Field or Option	IBM Keyword	Default Value	See Page
Retention period	RETPD	n/a	6-31
Expiration date	EXPDT	n/a	6-31
Disconnect from Catalog	EXPORT DISCONNECT	n/a	6-31
Import Indataset	INDATASET	n/a	6-31
Import into Catalog	OUTDATASET	n/a	6-31
Device Type	UNIT	n/a	6-31
Volser	VOLUMES	n/a	6-31
Connect to Catalog	IMPORT CONNECT	n/a	6-31
Alias	ALIAS/NOALIAS	2 (No)	6-31
Intoempty	INTOEMPTY	2 (No)	6-31
Lock	LOCK	2 (No)	6-31

Field and Option Descriptions

Use the following fields to create JCL to export or import a catalog.

Exporting a Catalog

The Export option creates a backup copy of an ICF catalog. To export a catalog, type **1** in the option field, then complete the associated fields described below.

- Export from Catalog** Type the name of the catalog you want to export or disconnect. This is a required field.
- Export Outdataset** Type the name of the data set that is to receive the exported data. This is a required field.
- Unit** Type the storage unit for the exported data set, for example, DISK. This is a required field.
- Space in cylinders** Type the number of cylinders, between 1 and 999, to be allocated for the exported catalog when the **Unit** is DASD storage. Type **0** when the **Unit** is tape storage.
- Blksize** Type the block size for the data set. The minimum size allowed is 512, and the maximum is 32760. This is a required field.

Retention period Type the retention period for the data set using a number of days in the range of 1-999. This field and **Expiration date** are mutually exclusive.

Expiration date Type the expiration date for the data set using the form YYDDD or YYYY/DDD. This field and **Retention period** are mutually exclusive.

Disconnect from Catalog

Type the name of the catalog from which you want to delete a user catalog entry and any associated alias entries. This field is required when you want to disconnect a user catalog.

Importing a Catalog

The Import option moves or restores an ICF catalog. To import a catalog, type **2** in the option field, then complete the associated fields described below.

Import Indataset Type the name of the data set that contains a copy (export) of the catalog into which you are importing (recover). This is a required field.

Import into Catalog Type the name of the user catalog that is to receive the data. This is a required field.

Device Type Type the device type of the user catalog's volume that is named in the **Import into Catalog** field. This is a required field when you use the **Connect to Catalog** field.

Volser Type the volume serial number where the user catalog that is named in the **Import into Catalog** field resides. This field is required when you use the **Connect to Catalog** field.

Connect to Catalog Type the name of the master catalog to which you want to connect this user catalog.

Alias Type **1** if you want to create all aliases relating to the catalog. Type **2** if you do not want all aliases created.

Intoempty Type **1** if you are importing into a newly defined, empty catalog. Type **2** if you are importing into an existing catalog that has entries.

Lock Type **1** if you want the catalog you are importing to be locked. Locking the catalog restricts catalog access to authorized personnel. Type **2** if you do not want the catalog you are importing to be locked.

Delete Catalog, Alias, VVDS, NVR, VVR

RECOVERY MANAGER automates the ICF catalog processes of deleting a catalog, an alias, a VSAM volume data set (VVDS), a non-VSAM volume record (NVR), or a VSAM volume record (VVR).

Note: The object to be deleted must be empty. If, for example, the user catalog is not empty then the DELETE will fail with the following messages:

```
IDC3009I ** VSAM CATALOG RETURN CODE IS 152 -
REASON CODE IS IGG0CLFK-0
```

```
IDC0551I ** ENTRY user.catalog NOT DELETED
```

If the catalog is not empty and all of its entries are to be deleted, manually update the generated JCL, adding the FORCE parameter within the DELETE CATALOG command. When the JCL is run, the operator must reply to the following message:

```
IDC1997I user.catalog AND ITS DATA SETS TO BE
DELETED; REPLY 'Y' TO DELETE, 'N' TO CANCEL
```

For additional information, see the “warnings” for the FORCE parameter on the DELETE command in IBM's publication *DFSMS/MVS Version 1 Release 4, Access Method Services for the Integrated Catalog Facility* (Document Number SC26-4906-04).

Table 6-7 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-7 Delete Catalog, Alias, VVDS, NVR, or VVR Options

Field or Option	IBM Keyword	Default Value	See Page
Usercatalog	DELETE USERCATALOG	n/a	6-33
Alias	DELETE ALIAS	n/a	6-33
Catalog	CATALOG	n/a	6-33
VVDS volser	DELETE and VOL=SER=	n/a	6-33
Unit	UNIT=	n/a	6-33
NVR	DELETE NVR	n/a	6-33
Volser	VOL=SER=	n/a	6-33
Unit	UNIT=	n/a	6-33

Table 6-7 Delete Catalog, Alias, VVDS, NVR, or VVR Options

Field or Option	IBM Keyword	Default Value	See Page
VVR	DELETE VVR	n/a	6-33
Volser	VOL=SER=	n/a	6-33
Unit	UNIT=	n/a	6-33
Recovery	RECOVERY/NORECOVERY	2 (No)	6-34
Purge	PURGE/NOPURGE	2 (No)	6-34

Field and Option Descriptions

Usercatalog	If you want to delete a user catalog, type the catalog name in this field.
Alias	If you want to delete an alias, type the name in this field.
Catalog	When deleting an alias, type the name of the master catalog in this field.
VVDS volser	If you want to delete a VVDS, type the volume serial on which it is located in this field.
Unit	When deleting a VVDS, type the unit on which it is located in this field.
NVR	If you want to delete an NVR, type its name in this field.
Volser	When deleting an NVR, type the volume serial on which it is located in this field.
Unit	When deleting an NVR, type the unit on which it is located in this field.
VVR	If you want to delete a VVR, type its name in this field.
Volser	When deleting a VVR, type the volume serial on which it is located in this field.
Unit	When deleting a VVR, type the unit on which it is located in this field.

Recovery

Type **1** to set this option to **Yes**. It is available when you choose to delete a user catalog or a VVDS. When you choose to delete a user catalog and set **Recovery** to **Yes** the following are deleted:

- the user catalog
- its VSAM volume record (VVR)
- its VTOC entries

Note: After deleting the user catalog, you should replace it with an imported backup copy.

When you choose to delete a VVDS and set **Recovery** to **Yes** the following results:

- the VVDS catalog entry is removed
- the VVDS's DSCB is scratched from the VTOC

Note: After deleting the VVDS, you should replace it by redefining it, then load the appropriate VSAM data sets on the volume.

Purge

When this option is selected, the specified object is deleted, regardless of the retention period set for it. Type **1** (Yes) to select this option.

Note: You cannot set both **Recovery** and **Purge** to **Yes**.

Delete NOSCRATCH / Define RECATALOG

RECOVERY MANAGER automates use of the DELETE NOSCRATCH and DEFINE RECATALOG commands.

The **DELETE NOSCRATCH VSAM Object** option removes entries from a catalog for VSAM objects on a volume that has become inaccessible. You are not required to have access to the volume.

The **DEFINE RECATALOG VSAM Object** option recatalogs VSAM objects. To use this command, the corresponding entries in the VVDS and VTOC must exist.

The **Define RECATALOG VVDS** option catalogs a VSAM volume data set. This must be requested prior to deleting a VVDS.

Table 6-8 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-8 DELETE NOSCRATCH/Define RECATALOG Options

Field or Option	IBM Keyword	Default Value	See Page
VSAM Object	n/a	n/a	6-35
Volume	n/a	n/a	6-35

Option Descriptions

VSAM Object

Type the name of the VSAM object for which you want to remove entries. This field is required when you use the **Delete NOSCRATCH VSAM Object** option or the **Define RECATALOG VSAM Object** option.

Volume

Type the name of the volume on which the VSAM object is located. This field is required if you are using the **Define RECATALOG VSAM Object** option or the **Define RECATALOG VVDS** option.

Print Catalog, VVDS, VTOC

Use RECOVERY MANAGER to quickly and easily print a catalog, a VSAM volume data set (VVDS), or a volume table of contents (VTOC). Select from the following options, then complete the associated fields:

1. **Print Catalog**
2. **Print VVDS**
3. **Print VTOC**

Table 6-9 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-9 Print Catalog, VVDS, VTOC Options

Field or Option	IBM Keyword	Default Value	See Page
Catalog Name	n/a	n/a	6-36
Volume	n/a	n/a	6-36
Unit	n/a	n/a	6-36
Connected catalog only	n/a	1 (No)	6-36
Volume	n/a	n/a	6-36
Unit	n/a	n/a	6-36

Table 6-9 Print Catalog, VVDS, VTOC Options

Field or Option	IBM Keyword	Default Value	See Page
Format	FORMAT	1 (No)	6-36

Option Descriptions

Complete the following field when you want to print a catalog.

Catalog Name

Type the name of the catalog you want to print.

Complete the following field when you want to print a VVDS.

Volume

Type the volume on which the VVDS resides.

Unit

Type the unit (device type) on which the VVDS resides.

Connected Catalogs only

Select whether you want to print only the first record, which will contain only connected catalogs. Type **1** for **Yes** or **2** for **No**. **No** is the default.

Complete the following field when you want to print a VTOC.

Volume

Type the volume on which the VTOC resides.

Unit

Type the unit (device type) on which the VTOC resides.

Format

Select whether you want to format the printed VTOC. Type **1** for **Yes** or **2** for **No**. **No** is the default.

Diagnose/Examine Catalog Integrity

RECOVERY MANAGER automates the use of the DIAGNOSE and EXAMINE commands to test the structural integrity of a catalog and to identify problems with a catalog.

- Use the **Examine Structural Integrity** option to examine the integrity of a BCS.
- Use the **Diagnose ICFCATALOG** option to check a BCS.
- Use the **Diagnose VVDS** option to inspect the contents of a VVDS and look for logical synchronization errors.

Table 6-10 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-10 Diagnose/Examine Catalog Integrity Options

Field or Option	IBM Keyword	Default Value	See Page
Catalog/Cluster	n/a	n/a	6-37
Indextest	INDEXTEST/NOINDEXTEST	1 (Yes)	6-37
Datatest	DATATEST/NODATATEST	2 (No)	6-37
Errorlimit	ERRORLIMIT(value)	0	6-37
Catalog	ICFCATALOG	n/a	6-37
Catalog volume	n/a	n/a	6-37
Catalog unit	n/a	n/a	6-38
VVDS Volume	n/a	n/a	6-38
VVDS unit	n/a	n/a	6-38
Compare	COMPAREDD or COMPAREDS	2 (No)	6-38
Errorlimit	ERRORLIMIT(value)	0	6-38

Field and Option Descriptions

Use the following fields with the **Examine Structural Integrity** option.

- Catalog/Cluster** Type the name of the catalog or VSAM cluster you want to examine. This is a required field.
- Indextest** Type **1 (Yes)** in this field if you want to test the index; otherwise, type **2 (No)**. This is a required field. **Yes** is the default.
- Datatest** Type **1 (Yes)** in this field if you want to test the data; otherwise, type **2 (No)**. This is a required field. **No** is the default.
- Errorlimit** The job will stop after the specified number of errors is detected. Type a number of errors from 0 through 9999. This is a required field.

Use the following fields with the **Diagnose ICFCATALOG** option or the **Diagnose VVDS** option.

- Catalog** Type the name of the basic catalog structure (BCS) you want to scan for diagnosis. This field is required when you select option 2, **Diagnose ICFCATALOG** or when you select option 3, **Diagnose VVDS** and set the **Compare** field to **Yes**.
- Catalog volume** Type the name of the volume on which the BCS you want to scan is located. This field is required when you select option 2, **Diagnose ICFCATALOG** or when you select option 3, **Diagnose VVDS** and set the **Compare** field to **Yes**.

Catalog unit	Type the device type on which the BCS you want to scan is located. This field is required when you select option 2, Diagnose ICFCATALOG or when you select option 3, Diagnose VVDS and set the Compare field to Yes .
VVDS Volume	Type the name of the volume on which the VVDS you want to scan is located. This field is required when you select option 3, Diagnose VVDS or when you select option 2, Diagnose ICFCATALOG and set the Compare field to Yes .
VVDS unit	Type the device type on which the VVDS you want to scan is located. This field is required when you select option 3, Diagnose VVDS or when you select option 2, Diagnose ICFCATALOG and set the Compare field to Yes .
Compare	Type 1 (Yes) if you want to compare the BCS and VVDS to verify catalog integrity; otherwise, type 2 (No) . This field is required if you select the Diagnose ICFCATALOG option or the Diagnose VVDS option.
Errorlimit	Examine error messages will be suppressed after the specified number of errors are output, however, processing continues. Type a number of errors from 0 through 9999. This is a required field.

IDCAMS Listcat

Use RECOVERY MANAGER to set parameters for the IDCAMS LISTCAT. You have the option of viewing the output online or generating a batch job.

Note: Because processing time can be lengthy, when you select **Catalog** as the **Type**, you must also select **Generate Batch Job**.

Choose a LISTCAT Output method, then select from the following options:

1. **Name**—Use this option to list information about an entity, level of entries, or catalog you specify.
2. **List aliases in master catalog**—Use this option to list all aliases in the master catalog you specify.
3. **List aliases related to user catalog**—Use this option to list all aliases related to the user catalog you specify.
4. **List VVDSs associated with user catalog**—Use this option to list all VSAM volume data sets (VVDSs) associated with the user catalog you specify.
5. **List all user catalogs**—Use this option to list all user catalogs on the system.

Table 6-11 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-11 IDCAMS Listcat Options

Field or Option	IBM Keyword	Default Value	See Page
LISTCAT Output	n/a	n/a	6-39
Name	n/a	n/a	6-39
Type	ENTRIES LEVEL CATALOG	1 (Entries)	6-39
Parm	ALL ALLOCATION VOLUME NAME	4 (Name)	6-40
Catalog	CATALOG	n/a	6-40
Master catalog	ALIAS	n/a	6-40
User catalog (List aliases)	ALIAS USERCATALOG	n/a	6-40
User catalog (List VVDSs)	VVDS USERCATALOG	n/a	6-40

Field and Option Descriptions

LISTCAT Output Type **1** in this field to view the output online. Type **2** to generate a batch job for the output.

Name Type the name of the entity for which you want to list information. You can name an entry, a level, a catalog, an alias, a data set, or other entity. This field is required when you use the **Name** option.

Type Select one of the following options to identify the entity specified in the **Name** field.

Entries—specifies that the entity is an entry.

Level—specifies that all entries matching the designated level of qualification are to be listed, regardless of the number of additional qualifiers.

Catalog—indicates that you want to list information about a catalog. Type the name of the catalog in the **Catalog** field.

Parm	<p>Select from the following options to specify the amount of information you want listed.</p> <p>All—specifies that all fields are to be listed. Selecting this option generates the most information.</p> <p>Allocation—specifies that the information provided by specifying Volume plus detailed information about the allocation are to be listed. The information about allocation is listed only for data and index component entries.</p> <p>Volume—specifies that volume serial numbers and device types allocated to the entries are to be listed. Volume information is only listed for data and index component entries, non-VSAM data set entries, and user catalog connector entries.</p> <p>Name—specifies that only the name and entry type of the entries are to be listed.</p>
Catalog	Type a catalog name to limit the scope of the LISTCAT to a specific catalog. This field is required when the requested Type is Catalog .
Master catalog	Type the name of a master catalog for which you want to list all aliases.
User catalog	Type the name of a user catalog for which you want to list related aliases.
User catalog	Type the name of a user catalog for which you want to list associated VVDSs.

View Catalog Allocation

You can use RECOVERY MANAGER to view space allocation information for an ICF catalog. RECOVERY MANAGER generates the allocation portion of IDCAMS Listcat and displays the output online.

Table 6-12 lists the available field along with the RECOVERY MANAGER defaults and IBM keywords. The field is described following the table.

Table 6-12 View Catalog Allocation Options

Field or Option	IBM Keyword	Default Value	See Page
Catalog name	n/a	n/a	6-41

Option Descriptions

Catalog Name Type the name of an existing ICF user catalog or master catalog to view its space allocation information. This is a required field.

Catalog Space Calculator

RECOVERY MANAGER calculates the amount of space needed for the ICF catalog and displays it in the **Estimated space** in fields. You can make changes to the options, then press the **Enter** key again to recalculate space requirements based on the new information.

Note: To allow for growth in the catalog and possible inaccuracies in the calculation, increase the amount of space for the catalog above what RECOVERY MANAGER recommends.

Table 6-13 lists the available options along with the RECOVERY MANAGER defaults and IBM keywords. The options are described individually following the table.

Table 6-13 Catalog Space Calculator Options

Option	IBM Keyword	Default Value	See Page
User Catalog Connector	user catalog connector	0	6-42
Generation Data Group	generation data group	0	6-42
Generation Data Set	generation data set	0	6-42
Non-VSAM Data Set	non-VSAM data set	0	6-42
VSAM ESDS, RRDS, Linear	VSAM entry-sequenced data sets, relative record data sets, or linear data sets	0	6-42
VSAM KSDS	VSAM key-sequenced data set	0	6-42
Alias Entry	alias entry	0	6-42
Alternate Index	alternate index	0	6-42
Path	path	0	6-42
Device Type	device type	3390	6-42
Freespace	freespace	0	6-43

Option Descriptions**User Catalog Connector**

Type the number of user catalog connectors the ICF catalog will contain. Each catalog connector will include space for aliases. Numbers from 0 through 999 are valid. This is a required field.

Generation Data Group

Type the number of generation data groups the ICF catalog will contain. Numbers from 0 through 999,999 are valid. This is a required field.

Generation Data Set

Type the number of generation data sets the ICF catalog will contain. Numbers from 0 through 999,999 are valid. This is a required field.

Non-VSAM Data Set Type the number of non-VSAM data sets the ICF catalog will contain. Numbers from 0 through 999,999 are valid. This is a required field.

VSAM ESDS, RRDS, Linear

Type the number of entry-sequenced data sets, relative record data sets, and linear data sets that the ICF catalog will contain. Numbers from 0 through 999,999 are valid. This is a required field.

VSAM KSDS

Type the number of key-sequenced data sets the ICF catalog will contain. Numbers from 0 through 999,999 are valid. This is a required field.

Alias Entry

Type the number of alias entries the ICF catalog will contain. Numbers from 0 through 99,999 are valid. This is a required field.

Alternate Index

Type the number of alternate indexes the ICF catalog will contain. Numbers from 0 through 99,999 are valid. This is a required field.

Path

Type the number of paths the ICF catalog will contain. Numbers from 0 through 99,999 are valid. This is a required field.

Device Type

Type the device type (unit) on which the ICF catalog will reside. This is a required field. Valid types follow. The default is **3390**.

- 3350
- 3375
- 3380
- 3390
- 9345

Freespace

Type the percentage of each control interval and control area to be reserved as free space. Percentages of 0 through 100 are valid. The default is **0**. This is a required field.

Note: If the number of bytes calculated is less than a cylinder for the specified device type, RECOVERY MANAGER rounds up to a cylinder's number of bytes.

ICF Catalog Maintenance Procedures

Summary: These procedures describe ICF catalog maintenance tasks you can perform with RECOVERY MANAGER.

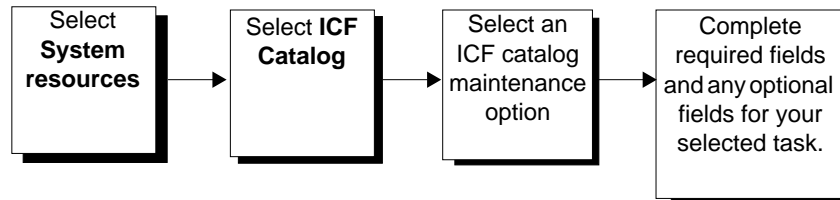


Figure 6-4 ICF Catalog Maintenance

Before You Begin

To perform this procedure, you need the following:

- access to data sets to export
- **Alter** authority for the user catalog
- **Update** authority for the master catalog
- **Read** authority for the data set when performing a LISTCAT of all entries
- **Alter** authority for the data set when performing a LISTCAT for a specific entry
- **Read** authority for the catalog when performing a LISTCAT of all entries
- **Alter** authority for the catalog when performing a LISTCAT for a specific entry

Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries

Begin each of these procedures at the RECOVERY MANAGER Main Menu, then perform the following steps:

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries**, then press **Enter**. The Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel appears.
- Step 4** Skip to the procedure for the task you want to perform:
- “Defining a Catalog” on page 6-45
 - “Changing a Catalog” on page 6-46
 - “Moving a Catalog” on page 6-47
 - “Renaming a Catalog” on page 6-48
 - “Splitting a Catalog” on page 6-49
 - “Merging Catalogs” on page 6-51
 - “Moving Entries” on page 6-51

Defining a Catalog

- Step 1** Select the **Define Catalog** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Catalog Definition/Allocation panel.
- RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.
 - You cannot advance to the Catalog Definition/Allocation panel until you have completed all required fields on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Step 2 On the Catalog Definition/Allocation panel, complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 3 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 4 Save the JCL data set or submit the job.

Changing a Catalog

Step 1 Select the **Change Catalog** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Catalog Definition/Allocation panel.

- RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.
- You cannot advance to the Catalog Definition/Allocation panel until you have completed all required fields on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Step 2 On the Catalog Definition/Allocation panel, complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 3 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 4 Save the JCL data set or submit the job.

Moving a Catalog

Step 1 Select the **Move Catalog** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Catalog Definition/Allocation panel.

- RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.
- You cannot advance to the Catalog Definition/Allocation panel until you have completed all required fields on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Step 2 On the Catalog Definition/Allocation panel, complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 3 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 4 Save the JCL data set or submit the job.

Renaming a Catalog

Step 1 Select the **Rename Catalog** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Catalog Definition/Allocation panel.

- RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.
- You cannot advance to the Catalog Definition/Allocation panel until you have completed all required fields on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Step 2 On the Catalog Definition/Allocation panel, complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 3 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 4 Save the JCL data set or submit the job.

Splitting a Catalog

Step 1 Select the **Split Catalog** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Catalog Definition/Allocation panel.

- RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.
- You cannot advance to the Catalog Definition/Allocation panel until you have completed all required fields on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Step 2 On the Catalog Definition/Allocation panel, complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Level Specification panel.

Note: You cannot advance to the Level Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 3 On the Level Specification panel, perform the following:

3.A Type the levels of the data set names you want to process.

Note: For more information, see “Field or Option Descriptions: Level Specification Panel” on page 6-22.

3.B Press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 4 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 5 Save the JCL data set or submit the job.

Merging Catalogs

Step 1 Select the **Merge Catalogs** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the JCL Specification panel.

Note: RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.

Step 2 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 3 Save the JCL data set or submit the job.

Moving Entries

Step 1 Select the **Move Entries** option, then complete the required fields and any optional fields you want to specify. Press **Enter** to advance to the Level Specification panel.

- RECOVERY MANAGER places the cursor on any required fields that you have not completed. If you have typed an invalid entry in a field, RECOVERY MANAGER indicates this with a message in the upper-right corner of the screen. For details about each field, including whether it is required, see “Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries Options” on page 6-18.
- You cannot advance to the Level Specification panel until you have completed all required fields on the Define/Change/Move/Rename/Split/Merge Catalogs/Move Entries panel.

Step 2 On the Level Specification panel, perform the following:

2.A Type the levels of the data set names you want to process.

Note: For more information, see “Field or Option Descriptions: Level Specification Panel” on page 6-22.

2.B Press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Catalog Definition/Allocation panel. For details about each field, including whether it is required, see “Catalog Definition/Allocation Options” on page 6-20.

Step 3 Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 4 Save the JCL data set or submit the job.

Creating an Alternate Master Catalog

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.

Step 2 Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.

Step 3 Select **Create Alternate Master Catalog**, then press **Enter**. The Create Alternate Master Catalog panel appears.

Step 4 Complete all of the fields, then press **Enter** to advance to the JCL Specification panel.

Note: You cannot advance to the JCL Specification panel until you have completed all required fields on the Create Alternate Master Catalog panel.

Step 5 Follow the instructions on the JCL Specification panel to generate JCL to create an alternate master catalog. Be aware of the following:

- The output data set must be cataloged.
- If it is a partitioned data set, you must specify the member name.

Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.

Note: Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.

Step 6 Save the JCL data set or submit the job.

Altering Catalog Attributes

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Alter Catalog Attributes**, then press **Enter**. The Alter Catalog Attributes panel appears.
- Step 4** Complete all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Alter Catalog Attributes panel.
- Step 5** Follow the instructions on the JCL Specification panel to generate JCL to alter the catalog attributes. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 6** Save the JCL data set or submit the job.

Defining an Alias or VVDS

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Define Alias, VVDS**, then press **Enter**. The Define Alias, VVDS panel appears.
- Step 4** Type **1** in the option to define an alias, or type **2** to define a VVDS.
- Step 5** Complete all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Define Alias, VVDS panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL to define the alias or VVDS. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

Exporting or Importing a Catalog

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Export/Import Catalog**, then press **Enter**. The Export/Import Catalog panel appears.
- Step 4** Select option 1 to export or disconnect a catalog. Select option 2 to import or connect a catalog.
- Step 5** Complete all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Export/Import Catalog panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL to export or import the catalog. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

Deleting a Catalog, Alias, VVDS, NVR, or VVR

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Delete Catalog, Alias, VVDS, NVR, VVR**, then press **Enter**. The Delete Catalog, Alias, VVDS, NVR, VVR panel appears.
- Step 4** For the task you want to complete, enter information in all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Delete Catalog, Alias, VVDS, NVR, VVR panel.
- Step 5** Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 6** Save the JCL data set or submit the job.

Deleting NOSCRATCH or Defining RECATALOG

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Delete NOSCRATCH/Define RECATALOG**, then press **Enter**. The Delete NOSCRATCH/Define RECATALOG panel appears.
- Step 4** Select one of the following options:
1. **Delete NOSCRATCH VSAM Object**—Use this option to remove a VSAM object from the catalog.
 2. **Define RECATALOG VSAM Object**—This option recatalogs a VSAM object.
 3. **Define RECATALOG VVDS**—This option recatalogs a VVDS.
- Step 5** Complete the required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Delete NOSCRATCH/Define RECATALOG panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

Printing a Catalog, VVDS, or VTOC

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Print Catalog, VVDS, VTOC**, then press **Enter**. The Print Catalog, VVDS, VTOC panel appears.
- Step 4** Select one of the following options:
1. **Print Catalog**
 2. **Print VVDS**
 3. **Print VTOC**
- Step 5** For the option you selected, complete the required fields. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Print Catalog, VVDS, VTOC panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

Diagnosing or Examining Catalog Integrity

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Diagnose/Examine Catalog Integrity**, then press **Enter**. The Diagnose/Examine Catalog Integrity panel appears.
- Step 4** Select one of the following options:
1. **Examine Structural Integrity**
 2. **Diagnose ICFCATALOG**
 3. **Diagnose VVDS**
- Step 5** For the option you selected, complete all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the Diagnose/Examine Catalog Integrity panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

Displaying the IDCAMS Listcat

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **IDCAMS Listcat**, then press **Enter**. The IDCAMS listcat panel appears.
- Step 4** Choose a LISTCAT Output method, then select one of the following options. See page 6-38 for a description of each option.
1. **Name**
 2. **List aliases in master catalog**
 3. **List aliases related to user catalog**
 4. **List VVDSs associated with user catalog**
 5. **List all user catalogs**
- Note:** Because processing time can be lengthy, when you select **Catalog** as the **Type**, you must also select **Generate Batch Job**.
- Step 5** Complete all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the IDCAMS Listcat panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL to run the Listcat. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

Viewing Catalog Allocation

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **View Catalog Allocation**, then press **Enter**. The View Catalog Allocation panel appears.

Calculating Catalog Space

Start this procedure at the RECOVERY MANAGER Main Menu.

- Step 1** Select **System resources**, then perform the following:
1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
 2. Select the site type (the default is **Local**).
 3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.
- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **Catalog Space Calculator**, then press **Enter**. The Catalog Space Calculator panel appears.
- Step 4** Complete all fields, then press **Enter**. RECOVERY MANAGER calculates the space requirements, then displays the results in the **Estimated space** fields. To recalculate, type new values in the fields, then press **Enter** again.

Integrated Catalog Forward Recovery Utility

RECOVERY MANAGER creates JCL to generate Integrated Catalog Forward Recovery Utility (ICFRU) functions.

Note: For information about Year 2000 support for ICFRU, see IBM APAR GA15492.

You can choose from the following options:

1. **Generate Extract and Sort Steps**—Extracts SMF records and sorts them by data set name, date, and time. These records can then be applied to the ICF catalog backup copy (the IDCAMS EXPORT copy).
2. **Generate Apply Step**—applies extracted and sorted SMF records to the ICF catalog backup copy (the IDCAMS EXPORT copy).
3. **Generate Apply and Import Steps**—applies each catalog change that has been made since your last backup, then imports the new data set as the recovered ICF catalog.
4. **Generate All Steps**—generates all of the above steps (Extract, Sort, Apply, and Import).
5. **View Catalog Recovery Methodology**—displays the Full Catalog Recovery Procedure as documented in IBM's ICFRU Program Description/Operations Manual, SH20-6952.

Table 6-14 lists the available fields and options along with the RECOVERY MANAGER defaults and IBM keywords. The fields and options are described individually following the table.

Table 6-14 Integrated Catalog Forward Recovery Utility Options

Field or Option	IBM Keyword	Default Value	See Page
Catalog Name (or **)	CATALOG	n/a	6-64
SMF Input	SMFIN DD	n/a	6-64
SMF Extract (sortin)	SORTIN	n/a	6-64
SMF Sortout	SORTOUT	n/a	6-64
Input Export Dataset	EXPIN DD	n/a	6-64
New Export Dataset	OUTDATASET	n/a	6-64
Max SMF Record Gap	GAPTIME	n/a	6-64
Max Clock Difference	CLOCKDIFFERENCE	n/a	6-65

Table 6-14 Integrated Catalog Forward Recovery Utility Options

Field or Option	IBM Keyword	Default Value	See Page
Start Scan	STARTDATE STARTTIME	n/a	6-65
End Scan	STOPDATE STOPTIME	n/a	6-65
Sort Program	SORT PGM	ICEMAN	6-65

Field and Option Descriptions

Catalog Name (or **)

Type the name of an ICF catalog, or type ** to select all catalogs within the **Start Scan** and **End Scan** parameters you set. This is a required field.

Note: The use of the wildcard pattern ** is valid only for the **Extract and Sort Steps** option.

SMF Input

Type the data set containing the set of all SMF records from all systems with access to the catalogs to be recovered. The minimum requirement is the set of all SMF records of type 61, 65, and 66. This is a required field.

SMF Extract (sortin)

Type the name of the data set containing the data to be sorted. This is a required field.

SMF Sortout

Type the name of the data set in which the sorted SMF records are to be placed. This is a required field.

Input Export Dataset

Type the name of the backup copy of the catalog to be used for the recovery. This is a required field for the **Apply Step**.

New Export Dataset

Type the name of the Export data set to be created by the apply process. This is a required field for the **Generate Apply Step** option.

Max SMF Record Gap

Specifies the maximum acceptable gap between SMF records. It is used to trigger warning messages about possible missing SMF data. This is a required field, and is limited to 4 numeric characters between 1 and 9999 minutes.

Note: If you are in doubt about this number, IBM recommends using 30 minutes, then check the ICFRRSV output for SWITCH SMF records. This indicates dates and times switches were done. Specify a value slightly smaller than the usual time to fill an SMF data set.

Max Clock Difference

In multi-system operation, differences in system clocks are possible. Use this field to adjust the start and stop times of these system clocks for use with SMF record selection. This is a required field, and is limited to 4 numeric characters between 1 and 9999 seconds.

Example: If you type 2, then 2 seconds will be subtracted from the **Start scan** time and added to the **End scan** time to reach effective start and end times. The adjusted times are used for SMF record selection.

Start Scan

Type the month, day, year, hour, minute, and second you want to begin with for SMF record selection. This is a required field.

End Scan

Type the month, day, year, hour, minute, and second you want to use as the stopping point for SMF record selection. This is a required field.

Sort Program

Type the name of the program you will use to sort the SMF data. The default is **ICEMAN**. This is a required field.

ICFRU Procedures

Summary: These procedures describe ICFRU functions you can perform with RECOVERY MANAGER.

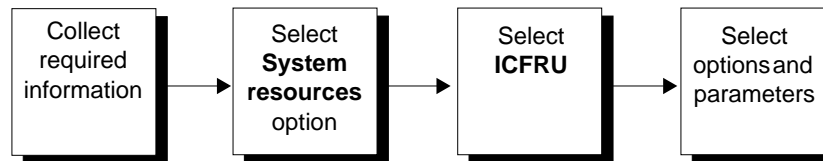


Figure 6-5 ICFRU Functions

Before You Begin

To perform this procedure, you need the following:

- authorization to perform IDCAMS Import on a catalog
- SMF record's data set name
- export data set name of the catalog to be imported
- start and end SMF record scan times (review the **Catalog Recovery Methodology** option)

ICFRU Functions

Start this procedure at the RECOVERY MANAGER Main Menu.

Step 1 Select **System resources**, then perform the following:

1. Enter a BMC subsystem name for RU for VSAM (required only if you are using the RU product).
2. Select the site type (the default is **Local**).
3. Press **Enter** to display the System Resource Backup, Recovery and Maintenance panel.

- Step 2** Select **ICF Catalog**. The ICF Catalog Maintenance panel appears.
- Step 3** Select **ICFRU**, then press **Enter**. The ICFRU panel appears.
- Step 4** Select one of the following options. See page 6-38 for a description of each option. See page 6-63 for descriptions of each step.
1. **Generate Extract and Sort Steps**
 2. **Generate Apply Step**
 3. **Generate Apply and Import Steps**
 4. **Generate All Steps**
 5. **View Catalog Recovery Methodology**
- Step 5** Complete all required fields and any optional fields you want to use. Press **Enter** to advance to the JCL Specification panel.
- Note:** You cannot advance to the JCL Specification panel until you have completed all required fields on the ICFRU panel.
- Step 6** Follow the instructions on the JCL Specification panel to generate JCL to generate the selected step. Be aware of the following:
- The output data set must be cataloged.
 - If it is a partitioned data set, you must specify the member name.
- Press **Enter** to display the JCL. If an error occurs that prevents RECOVERY MANAGER from placing the JCL in the data set, follow the instructions displayed to try again.
- Note:** Both the data set name and the five lines of JCL are saved in your ISPF profile and are displayed each time you generate JCL.
- Step 7** Save the JCL data set or submit the job.

System Resource Information

RECOVERY MANAGER displays detailed information about your system and TSO session that you can use for quick reference.

To view this information, select **System resources** from the Main Menu to advance to the System Resource Backup, Recovery and Maintenance panel. Select **Information** to display the following details:

- current time, day, and date
- system name, type, and number
- your user id and TSO/E profile prefix value
- your logon proc and account number
- amount of CPU and service units you have used
- time, day, date, and volume of the last IPL
- MVS release you are using
- size of the private region you are using
- DFHSM and RACF level you are using
- ISPF and TSO/E level you are using

Chapter 7 Coordinated Recovery Support

This chapter discusses the support RECOVERY MANAGER provides for coordinated recoveries in an MVS environment when using BMC Software's COORDINATED RECOVERY MANAGER (CRM™) for MVS product.

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Using RECOVERY MANAGER from CRM

Before you use RECOVERY MANAGER for OS/390 from the CRM product for the first time, you should ensure that you have performed all the necessary prerequisites for a successful session. This section provides a summary of those prerequisites, makes some recommendations, and provides pointers to sources of more information.

1. Both products must be installed. The installation procedures provided in the BMC Software *Backup and Recovery Products for DB2 and OS/390 Installation Guide* include both products. If the recommended version of CRM is already installed, you need only install RECOVERY MANAGER. See “CRM and RECOVERY MANAGER Installation Considerations” on page 2-5.
2. Define your XCF (cross-coupling facility) groups. Such groups can include IMS, MVS, and DB2 members.

An XCF group name connects CRM and an instance of the RECOVERY MANAGER server program (MRMXSTC). The member name within the group connects an MVS RECOVERY MANAGER to the CRM as follows:

- One XCF group per CRM repository is allowed.
 - Use the CONNECT command to connect an MVS RECOVERY MANAGER to CRM. See “CONNECT GROUP” on page 7-8 for more information about the CONNECT command.
3. The RECOVERY MANAGER server program (MRMXSTC) must be active to perform coordinated recoveries as follows:
 - It must run on the same MVS system as the BMC subsystem if RECOVERY UTILITY for VSAM (RUV™) is used.
 - Multiple MRMXSTC programs can run concurrently.
 - A value of 1440 (unlimited) is recommended for the TIME parameter.
 4. If you plan to generate recovery JCL for RECOVERY MANAGER groups, ensure that your job card and output data set names are set up correctly. See “Preparing the CICS Environment” on page 7-4 for more information.

Authorizations Needed by CRM Users

CRM users who need access to RECOVERY MANAGER functionality should be aware of the following global authorization requirements. In addition, certain other authorizations may be required for specific RECOVERY MANAGER functions. See the sections that describe the supported functions for specific authorization information.

MRMXSTC (RECOVERY MANAGER Server) Authorization

Whether run as a started task or as a batch job, the RECOVERY MANAGER server program must run under an ID that has authority to perform all of the RECOVERY MANAGER functions that can be requested through CRM. Additionally, the program must be APF (Authorized Program Facility) authorized.

When the RECOVERY MANAGER server is run as a started task, the ID should be added to the started procedure table in the RACF (Resource Access Control Facility) library.

CRM User Security Group Connections

Security group connections can be associated with a CRM user through the program MRM3@ATH. See “RECOVERY MANAGER Authorizations” on page 2-11 for more information about authorizations.

The MRM3@ATH program uses the RACROUTE routine to locate security group connections. The program must be APF authorized to allow CRM users to access supported RECOVERY MANAGER functions in a RACF environment.

For non-SAF environments, the program must be replaced with a user-provided load module. It should accept two parameters, the primary ID of the CRM user and an address of storage to hold the security group connections. The module should be able to list the security group connections based on the primary ID (first parameter). The ID entries are eight bytes in length and padded with blanks. The security group connection storage holds a maximum of 254 eight-byte IDs. See “Customization of Authorizations” on page 2-17 for more information.

Preparing the CICS Environment

When you are using RECOVERY MANAGER for OS/390, CRM requires that you perform the following tasks *before initiating a recovery point*. These tasks define RECOVERY MANAGER programs to CICS and prepare your CICS environment.

- Step 1** Add the SDFH load library that contains CICS's module DFHXCEIX to the STEPLIB concatenation of your RECOVERY MANAGER server.
- Step 2** Add the RECOVERY MANAGER distribution library to the STEPLIB concatenation for your RECOVERY MANAGER server.
- Step 3** Add the RECOVERY MANAGER distribution library, containing the MRMVCLoS load module, to the DFHRPL concatenation in your CICS startup JCL.
- Step 4** Add to your CICS System Definition Data Set (CSD) the definitions for the MRMVCLoS load module and the MRMV transaction ID.

Note: If your site requires specific naming conventions for items defined in your CSD, you can change the default for the MRMVCLoS load module name and the MRMV transaction ID.

- To change the default name for MRMVCLoS, first rename the load module in the RECOVERY MANAGER distribution library and then define the new name in your CSD.
- To change the default transaction ID for MRMV, just define a new name in your CSD (no renaming is required). If you define non-defaults in your CSD you must provide the transaction ID and program name within your CONNECT statement for the RECOVERY MANAGER server. For more information, see "Control Commands for the Server" on page 7-7.

Figure 7-1 Sample MRMVCLOS Load Module Definition

```
DEFINE PROGRAM(MRMVCLOS) GROUP(MRMGROUP)
      LANGUAGE(ASSEMBLER)
```

Figure 7-2 Sample MRMV Transaction ID Definition

```
DEFINE TRANSACTION(MRMV) GROUP(MRMGROUP)
      PROGRAM(DFHMIRS)
      PROFILE(DFHCICSA)
```

In these two examples, the MRMVCLOS load module and the MRMV transaction ID are defined to the group MRMGROUP. You define a group name in your CSD by using this statement:

```
ADD GROUP (mrmgroup) LIST (listname)
```

CRM Control Information Considerations

The following MVS system and MVS control information is shared by any MVS systems that are served by any RECOVERY MANAGER using the same MRM\$OPTS file. View the following information by selecting **Control information** from the RECOVERY MANAGER Main Menu or by viewing the MRM\$OPTS file in the control data set (described in Appendix A).

- work space name for a temporary disk
- pseudo volumes used to archive data sets
- job card information (JCARD)
- name of the output data set (JCLOUT) used for recovery JCL storage and used for CRM job services requests; that is, backup and recovery JCL generation, recoverability, and audit and revalidation reports
- IBM and BMC Software program libraries
- RECOVERY MANAGER data set information

Be aware that when multiple RECOVERY MANAGER server programs are running concurrently, those programs may attempt to use the same output data set for the storage of recovery JCL. This situation can lead to naming collisions under certain conditions. See “REQID integer” on page 7-10 for a description of how the REQID command can be used to avoid this situation.

Warning! If you change any RECOVERY MANAGER control information, you can issue the REFRESH command (see “REFRESH” on page 7-10) to allow the MRMXSTC task to pick up the new information rather than stopping and restarting the task.

Group Naming Considerations

This section discusses the following:

- XCF member names
- handling of RECOVERY MANAGER group names by CRM
- potential conflicts between the names of XCF groups and other types of groups (for example, DB2 data sharing groups)

XCF Group Names

With CRM, you can specify XCF group names during installation and edit those group names after installation. After installation, the XCF group name is specified to MRMXSTC via the CONNECT command (see “CONNECT GROUP” on page 7-8).

Note: Conflicts are possible between XCF group names and names for other types of groups. *To avoid such conflicts, do not use an XCF name that is already used as a group name elsewhere.*

To avoid duplicating XCF group names used by IBM, follow these guidelines:

- Do not use the letters A through I as the first character.
- Do not use SYS as the first three characters.
- Do not use UNDESIG as a group name.

» Important Recommendation

Make all names and prefixes unique within the MVS sysplex.

XCF Member (RECOVERY MANAGER) Names

XCF member names are displayed to the CRM user as RECOVERY MANAGER names. CRM retrieves them via XCF. The name can be any string up to 13 characters.

The MRMXSTC program (the RECOVERY MANAGER server) receives the member name via the CONNECT command, described in “CONNECT GROUP” on page 7-8. It is used to direct requests to a specific instance of RECOVERY MANAGER.

Entering RECOVERY MANAGER Group Names

Be aware that CRM automatically capitalizes all information entered through the CRM online interface. Additionally, CRM does not support delimited identifiers as does RECOVERY MANAGER.

Automatic capitalization can adversely impact your ability to use wildcards in group name searches. CRM does not recognize RECOVERY MANAGER group names that include lowercase characters. You must use appropriate wildcards in the pattern to avoid entering lowercase characters.

For example, if you have a group containing lowercase characters such as RDADAF3.gXFOR and you type a pattern RDADAF3.g* at the CRM interface, the group will not be found because CRM translates your input to RDADAF3.G*.

» Important Recommendation

Do not use delimiters with RECOVERY MANAGER group names that can be used in a coordinated recovery environment.

Control Commands for the Server

To establish communications between CRM and specific MVS systems and RECOVERY MANAGERS via XCF, you must invoke the RECOVERY MANAGER server program, MRMXSTC. The program can be run as a started task or as a batch job, depending on your site practices or preferences.

Whether the RECOVERY MANAGER server is run as a batch job or as a started task, you can pass commands to it via the MVS MODIFY command or by MRMIN input data set control cards. You can enter MVS commands from an MVS console or any program that supports MVS commands.

These commands allow you to make or break connections and to perform other operations on the program.

The format for the MVS MODIFY commands is as follows:

f <*jobname*>, <*cmd*>
or
f <*identifier*>, <*cmd*>

where:

- *f* is an abbreviation for the MODIFY command
- *jobname* identifies the target job
- *identifier* is the procedure name if no identifier is otherwise provided
- *cmd* is one of the commands listed in this section

The following sections describe the available commands in alphabetical order. Many commands can be abbreviated. The abbreviations are shown underlined in the command name. Any command issued, whether at startup or from the console, and whether in a batch job or started task, is echoed to the print data set.

Figure 7-3 on page 7-15 shows an example of a batch job containing control commands. Any unrecognized commands are treated as comments. All commands automatically flush the print buffer.

CANCEL

Use the CANCEL command to stop the MRMXSTC program immediately.

The program must be restarted before additional CRM requests can be processed.

CONNECT GROUP

Use the CONNECT command to allow connections to be established between CRM and a specific RECOVERY MANAGER and MVS system. You must enter the command in the following format:

```
CONNECT GROUP<grp_name> MEMBER<member_name> [MVS<vruid>]  
[CICS<applid,transx,prog> CICS<applid,transx,prog>]
```

In the CONNECT command:

- The GROUP keyword is required. *grp_name* identifies the XCF group to which the member belongs. This is the name you defined to the CRM domain during installation.
- The MEMBER keyword is required. *member_name* identifies a particular instance of RECOVERY MANAGER and is displayed by CRM as a RECOVERY MANAGER name.

The name should be a meaningful term; for example, you could use *<vruid>#<applid>* or *<mvsid>*, where *vruid* identifies the RUV™ subsystem id and *applid* identifies the CICS applid or *mvsid* identifies the MVS system on which MRMXSTC is running. The *member_name* term must be unique within the XCF group.

- The MVS keyword is required. *vruid* is optional. When specified, it identifies the BMC subsystem to be used with RUV™. If you do not specify *vruid*, the program uses the system default subsystem.
- The CICS keyword is optional. You can have 0 - 64 CICS keywords per CONNECT.

applid—If the CICS keyword is specified, *applid* is required to identify CICS (Customer Information Control System). The maximum length is 8 characters.

transx—The transaction ID for RECOVERY MANAGER (*transx*) is optional and defaults to MRMV. The maximum length is 4 characters.

prog—The program that issues the CICS CLOSE commands (*prog*) is optional and defaults to MRMVCLCLOS. The maximum length is 8 characters.

The group name cannot exceed 8 characters and the member name you provide cannot exceed 13 characters. RECOVERY MANAGER adds the prefix MRM to the member name for a total of 16 characters. Valid characters are A through Z, 0 through 9, \$, #, and @.

An example of a CONNECT command that makes a connection from the RECOVERY MANAGER server to CRM is:

```
CONN G(XCFGRP1) M(MVSRMGR@SYSN) MVS
CICS(MVSAAA, ,MRMVCLCLOS)
```

DISCONNECT GROUP(*group_name*) MEMBER(*member_name*)

Use the DISCONNECT command to disallow connections between CRM and a specific RECOVERY MANAGER and MVS system. After disconnecting, the XCF group member can be reconnected to any RECOVERY MANAGER server.

See “CONNECT GROUP” on page 7-8 for format details.

MAXTASKS *integer*

Use the MAXTASKS command to specify the maximum number of CRM requests to be run concurrently by MRMXSTC. Remaining requests are queued and are started in the order received.

The variable *integer* must be in the range of 10 through 200, and the default is 30.

REFRESH

Use the REFRESH command to avoid stopping and restarting CRM tasks after changing any RECOVERY MANAGER control information.

Warning! If you do not use the REFRESH command or cancel and restart the job after making changes to the RECOVERY MANAGER control information, the MRMXSTC task continues to use the previous values.

REQID *integer*

Use the REQID command to generate unique request IDs in the range of 1 to 9999999. The request ID can be used for substitution in the following:

- job card images
- naming members of output data sets

The current value is used to replace any &#...# terms that are in the job card images or member names.

You can let MRMXSTC generate a starting request ID for you, or you can set the value yourself using the REQID command. If you run only one instance of the MRMXSTC program, there are no significant advantages of one method over the other.

If you run more than one instance of MRMXSTC, you must consider whether any of them share the RECOVERY MANAGER control file MRM\$OPTS and consequently share the output data sets (JCLOUT) where generated JCL is stored. If they do not share the control file, there are no significant advantages of one method over the other.

If you run more than one instance of MRMXSTC and one or more of them share the RECOVERY MANAGER control file, it is possible for conflicts to arise unless you provide unique IDs for each instance of MRMXSTC. For example, a partitioned data set name may be ABC.JCL(M#####) where the # signs are replaced with the request ID when the job runs. If you set the starting request ID to 1 for each instance of MRMXSTC, there can be conflicts.

To avoid these conflicts, you can use a starting request ID for one program that is sufficiently removed numerically from the starting request IDs of others to accommodate all the possible requests that might occur. For example, if three MRMXSTC programs share a control file, the first one could start at 1, the second at 10001, and the third at 20001.

You can also let the system automatically generate a starting request ID based on a unique number generated by XCF. There is a minimal possibility of conflict with this method.

To summarize:

- Automatically generated numbers provide a minimal possibility of conflict, but the values are not predictable.
- With manually generated numbers, there is still a finite chance of conflict, but the values are more predictable.
- Sharing JCLOUT is avoided by requiring JCLOUT entries in the MRM\$OPTS file to be specified by subsystem ID. See Table A-1, “TSO, System, and User Information,” on page A-2.

STATUS

Use the STATUS command to print a status report to MRMPRINT. The report lists the following:

- active task queue and start times of each task
- inactive (waiting) task queue

Note: If no tasks are running, no status is printed.

STOP

Use the STOP command to stop the MRMXSTC program in an orderly manner, that is, when the program completes any work in progress. No new work is started.

The program must be restarted before additional CRM requests can be processed.

TIMEOUT *tick_limit,seconds*

Use the TIMEOUT command to stop the MRMXSTC program when it has stayed idle for the specified time limit. Use it to set the time when the started task ends. The variable *tick_limit* is the number of time intervals after which the program stops. The variable *seconds* is the length of each time interval in seconds. At the end of each time interval, a status report is printed.

Note: Do not confuse TIMEOUT with the timeout specified by the CRM user when requesting recovery point generation. See “Generating and Holding a Coordinated Recovery Point” on page 7-20.

TRACE ON

Use the TRACE ON command to enable a trace on the MRMXSTC program and related tasks. Its general use is for problem diagnosis. When the trace is enabled, any batch program submitted includes trace output. The command automatically inserts and removes the DD cards in the trace job as necessary. Trace messages are written to the MRMPRINT data set. They are written to MRMTRACE for batch jobs.

TRACE OFF

Use the TRACE OFF command to halt an existing trace on the MRMXSTC program. When the started task is initialized, TRACE defaults to OFF if not otherwise specified.

XCFINFO GROUP(*group_name*)

Use the XCFINFO command to list all members of the XCF group *group_name*, their job names, and XCF tokens. Use this command to resolve connection problems.

Specifying the MRMXSTC Data Set DD Statements

This section describes the data sets MRMXSTC uses. Each data set is specified by a *ddname* (data definition name). You must specify all the data sets in the JCL.

MRMXSTC requires a steplib with the MRMLoad module. It also requires the ARMLOAD module if you are using RECOVERY MANAGER for DB2*, and load libraries for other products you are using, such as AR/CTL and RUV.

RECOVERY MANAGER for OS/390 Data Sets

MRMLoad (required)

This is used by the JCL build routines for the program execution steplib.

MRMOPTS (required)

This is the RMGR control options data set. It is created during RMGR installation with the default name of *hlvl.RMGR.CNTL(MRMSOPTS)*, although you can choose a different name. The data set must be allocated with `DISP=SHR`.

MRMMSGs (required)

This is the RMGR messages data set. It is created during RMGR installation with the default name of *hlvl.RMGR.CNTL(MRMMSGs)*. The data set must be allocated with `DISP=SHR`.

MRMSLIB (required)

This data set is used for the ISPSLIB, ISPTABL, and ISPMLIB JCL statements.

RECOVERY MANAGER *for DB2** Data Sets

If you are using RECOVERY MANAGER *for DB2** you need the following data sets.

ARMLOAD (required with ARM)

This is used by the JCL build routines for the program execution steplib.

ARMMSGs (required with ARM)

This is the RMGR *for DB2** messages data set. It is created during RMGR installation with the default name of *hlvl.RMGR.CNTL(ARMMSGs)*. The data set must be allocated with `DISP=SHR`.

ARMOPTS (required with ARM)

This is the RMGR control options data set. It is created during RMGR installation with the default name of *hlvl.RMGR.CNTL(ARM\$OPTS)*, although you can choose a different name. The data set must be allocated with `DISP=SHR`.

COORDINATED RECOVERY MANAGER Data Sets

When using CRM, you need the following generic data sets for the RMGR server.

CRMPRINT (required)

This is used for the output from the RMGR server. Messages from RMGR are returned to CRM. CRMPRINT may be allocated to `SYSOUT` or to a data set with a DCB of `LRECL=121, RECFM=UBA`.

CRMMSGs (required)

This is the message file to be used by the RMGR server. Its contents are the same as ARMMSGs or MRMSGs.

CRMIN (required)

This is the input data set containing one or more control statements. Attributes for this data set must be fixed length records with record length of 80. (`RECFM=F` or `FB`, `LRECL=80`)

CRMERROR (optional)

This is the output for RMGR server run time errors. If errors are detected and CRMERROR is not present in the JCL, the errors are printed in the JES log. It may be allocated to `SYSOUT` or to a data set with a DCB of `LRECL=121, RECFM=VBA`.

CRMAPI (optional)

This is the XCF trace file.

Sample MRMXSTC Batch Job

Figure 7-3 is a sample MRMXSTC job showing the following:

- default MVS system ID parameter
- step library DD statement showing the applicable MVS version
- load library statements
- names of the messages and options files
- sample MRMIN control data set

A copy of this JCL is located in the MRMXSTC member of the RECOVERY MANAGER control data set.

```
//* RECOVERY MANAGER/OS/390 SERVICES FOR COORDINATED RECOVERY VIA XCF
//*
//MRMSERV EXEC PGM=MRMXSTC,REGION=0M,TIME=1440,
//STEPLIB DD DISP=SHR,DSN=BMCMRM.V120TEST.LOAD
//*****
//* MRM RECOVERY MANAGER DATASETS *
//*****
//MRMLOAD DD DISP=SHR,DSN=BMCMRM.V120TEST.LOAD
//MRMMSGS DD DISP=SHR,DSN=BMCMRM.V120TEST.CNTL(MRMMSGS)
//MRMOPTS DD DISP=SHR,DSN=ELS.V153TEST.CNTL(MRM$OPTS)
//MRMSLIB DD DISP=SHR,DSN=BMCMRM.V120TEST.SLIB
//*****
//* CRMXSTC DATASETS *
//*****
//CRMPRINT DD SYSOUT=*
//CRMAPI DD SYSOUT=* XCF TRACE
//CRMMSGS DD DISP=SHR,DSN=BMCMRM.V120TEST.CNTL(MRMMSGS)
//CRMERROR DD SYSOUT=*
//CRMIN DD *
CONNECT GROUP(MRMCXS) MEMBER(CXS@SYSO) MVS
/*
```

Figure 7-3 Sample MRMXSTC Job

Functions Supported for CRM

This section describes the following RECOVERY MANAGER functions that can be requested from CRM:

- creating volume groups
- generating backup JCL
- running backup JCL
- generating recovery JCL
- running recovery JCL

- revalidating groups
- reporting recovery assets
- auditing recoverability
- listing RECOVERY MANAGER groups
- viewing objects within a RECOVERY MANAGER group
- listing RECOVERY MANAGER recovery points for a group
- generating and holding a recovery point
- identifying a disaster recovery point

With the exception of the last two items, all functions are also available through RECOVERY MANAGER in a noncoordinated recovery environment.

Creating a Volume Group

A CRM user can request that RECOVERY MANAGER create a group of objects residing on one or more volumes by specifying the names of those volumes to RECOVERY MANAGER. RECOVERY MANAGER processes the request by searching the MVS catalog and creating a group of the objects residing on those volumes. RECOVERY MANAGER provides a name for the group in the form `<userid>.V<volser>yyyydddhmm` and returns that name to CRM.

Note: Do not use wildcards when you enter volume names for processing by RECOVERY MANAGER for OS/390. RECOVERY MANAGER does not support the use of wildcards in volume name specifications.

RECOVERY MANAGER stores the group in its own repository from which it can be retrieved by either CRM (via a group list request) or by a RECOVERY MANAGER user.

See “Building a New Group” on page 3-20 for a discussion of volume group creation and recovering objects after a volume failure.

No special authorizations are required for this function.

Generating and Running Backup or Recovery JCL

A CRM user can request that RECOVERY MANAGER generate JCL for a specified group or groups. RECOVERY MANAGER uses the batch program MRMBGEN to generate the JCL and informs CRM of the data set where it has been placed. RECOVERY MANAGER then proceeds to run the JCL when requested by CRM.

Through CRM, backups are always current copies of the data sets. However, you can request a recovery to one of the following:

- the current time
- a specified time from a list prepared by RECOVERY MANAGER
- a specified time from a list of CRM-generated recovery points.

Note: Any recovery request from CRM to RECOVERY MANAGER is implemented using force select processing.

Be aware that recovery options cannot be viewed or changed from the CRM interface. The option values in effect for the objects in the specified groups at the time the recovery JCL is generated will be used in the recovery. If you want to view or change options for a group, see “Group Utility Options” on page 3-34.

With this CRM request, two RECOVERY MANAGER processes are involved—*build* and *run*. The build process proceeds as follows:

1. checks authorizations to open the group and to open referenced utility options
2. builds the JCL required to run MRMBGEN
3. runs the MRMBGEN JCL and monitors the results
4. returns to CRM the results and name of the data set where the JCL is stored

When CRM requests that RECOVERY MANAGER run the JCL, RECOVERY MANAGER proceeds as follows:

1. checks authorizations to open the group and recover objects, or to open the group and do a backup for a backup request
2. checks authorization to open referenced utility options set
3. reads the backup or recovery JCL
4. submits the backup or recovery JCL
5. returns the job names and IDs to CRM after successful completion

To determine the results, you must view the job output.

Required Authorizations

To request a recovery from the CRM user interface, the CRM user must have **Alter** authority for the data sets in the group.

To request a backup from the CRM user interface, the CRM user must have **Read** authorization for each of the data sets in the group.

Revalidating and Reporting with CRM

When a CRM user requests RECOVERY MANAGER group revalidation or other reports, RECOVERY MANAGER uses the MRMBGPV program to perform those tasks, as described in “Batch Revalidation and Reporting” on page 3-47. This method allows revalidation to the current time only.

You can request the following reports through CRM:

- group revalidation
- object recoverability
- assets available for group recovery

When CRM requests any of these activities, RECOVERY MANAGER performs the build and run processes already mentioned.

RECOVERY MANAGER proceeds to perform the following functions:

1. checks authorizations to open the group and the referenced utility options
2. builds the JCL required to run MRMBGPV
3. sets the options as follows:
 - For revalidation, **Populate**, **Recoverability**, and **Replace** are set to **Yes** and a single report is generated for the local sitetype.
 - For recoverability, **Recoverability** is set to **Yes** and two reports are generated—one for the local site and one for the recovery site.
 - For asset availability, **Resources** is set to **Yes** and two reports are generated—one for the local site and one for the recovery site.
4. writes the JCL to the output data set and returns its name to CRM

Then, if you select execution, RECOVERY MANAGER proceeds to perform the following functions:

5. reads the report JCL
6. submits the JCL for MRMBGPV execution
7. returns the job names and IDs to CRM after successful submission

Required Authorizations

The following authorizations must be in place for a CRM user to obtain reports:

- **Open** authority for the group
- **All** authority for the group for revalidation

Listing RECOVERY MANAGER Groups

RECOVERY MANAGER provides the support necessary to honor requests from CRM to list RECOVERY MANAGER groups.

A CRM user can specify a group name or pattern to RECOVERY MANAGER for processing. RECOVERY MANAGER processes the request and returns the list of groups to CRM.

Note: When specifying RECOVERY MANAGER groups through CRM, be aware that CRM capitalizes all typed input. See “Entering RECOVERY MANAGER Group Names” on page 7-7 for more information.

Viewing a RECOVERY MANAGER Group

A CRM user with **Open** authority for the group can request a list of the objects in a specified RECOVERY MANAGER group for display on the CRM console.

Required Authorizations

A CRM user must have **Open** authority for the group to view the contents of a group.

Listing RECOVERY MANAGER Group Recovery Points

A CRM user with **Open** authority can request a list of recovery points for an existing RECOVERY MANAGER group by specifying a date and time range (in Greenwich Mean Time (GMT) or local time) for the recovery points and the name of the group. The recovery points are selected from those registered in RASCAT, RUV, or ABARS within the specified range.

When you make such a request, RECOVERY MANAGER locates backups and RUV archives for all objects in the group between the start time and end time specified. RECOVERY MANAGER then sends information to CRM. CRM displays the following for each recovery point:

- date and time of the recovery point in GMT
- recovery to a specific backup

Required Authorizations

A CRM user must have **Open** authority for the group to list group recovery points.

Generating and Holding a Coordinated Recovery Point

A CRM user can request that RECOVERY MANAGER generate a recovery point for all the objects in a specified CRM group containing one or more RECOVERY MANAGER groups.

» Important Recommendation

This process may perform lengthy backups. To decrease the length of the backup outage, use a hardware technology for backups, such as IBM's RAMAC SnapShot for MVS/ESA.

When building the group, RECOVERY MANAGER confirms that the group exists and that you are authorized to open it. It also confirms that you are authorized to read all data sets in the group. Backup JCL is built for all data sets in the group. For VSAM data sets, it backs up only the cluster. RECOVERY MANAGER returns the name of the data set containing the backup JCL.

The run process requires three phases, and varies depending on the data set type. RECOVERY MANAGER performs the following phase 1 processing:

1. calls AR/CTL with the list of all data sets in the group. This instructs AR/CTL to deallocate and wait at the next checkpoint.
2. issues the CLOSE command to any CICS listed on the CONNECT for VSAM data sets.

In phase 2 processing, RMGR performs the following:

1. runs the backup JCL and monitors it for completion.
2. returns the current time stamp in GMT to CRM when the phase completes.
3. issues CICS opens for any closed data sets (unless you selected SYNCHRONIZED RESTART=YES, in which case RMGR performs this step in phase 3).
4. issues RESUME commands to AR/CTL (unless you selected SYNCHRONIZED RESTART=YES, in which case RMGR performs this step in phase 3).

If the following steps were not completed in phase 2 processing, they are completed in phase 3:

1. RMGR issues CICS opens for any closed data sets (if you selected SYNCHRONIZED RESTART=YES. If not, RMGR performs this step in phase 2).
2. RMGR issues RESUME to AR/CTL, and AR/CTL automatically restarts the application as of the last check point.

If RMGR receives an ABEND request from CRM, it issues opens to CICS for any closed data sets, then issues RESUME commands for all data sets.

Note: A backup job in progress cannot be terminated; therefore it will run to completion.

If an error occurs at any point, any closed CICS data sets are reopened and RESUME commands are issued for all data sets.

Required Authorizations

To generate and hold a recovery point for a group from the CRM user interface, the CRM user must have the following authorizations:

- **Open** authorization for each of the specified RECOVERY MANAGER groups
- **Read** authorization for data sets in each group

Generating a Recovery Point for Coordinated Disaster Recovery

RECOVERY MANAGER includes facilities for providing a coordinated disaster recovery point on request from CRM. A CRM job can be scheduled to establish a recovery point for disaster recovery purposes across multiple RECOVERY MANAGERS. A recovery point is established without requiring any outage to MVS. The RECOVERY MANAGERS involved will use the recovery point established by the process to bring the systems involved to the same point in time at the disaster recovery site.

Required Authorizations

No additional authorization is required.

Chapter 8 Performance Considerations

This chapter discusses how you can minimize the time required to recover an application after a failure. It also discusses how you should recover an application in the event the RECOVERY MANAGER repository is involved in the failure.

Factors Affecting Recovery Time	8-2
Interactive Versus Batch Group Revalidation	8-2
Interactive Versus Batch JCL Generation	8-3
Repository Availability Considerations	8-3

Factors Affecting Recovery Time

To recover an application as quickly as possible after a failure, perform as much group processing as possible before recovery becomes necessary. In particular:

- Create application groups before a potential recovery and routinely update and revalidate them. If RECOVERY MANAGER detects changes, make new backups as necessary.

Group creation and group revalidation tasks may be better performed in batch mode. See “Interactive Versus Batch Group Revalidation” on page 8-2 for more information.

- In general, when you must recover a group, always revalidate it, and then generate and submit the JCL. JCL generated at an earlier time runs the risk of being inaccurate.
- Always consider generating recovery JCL in batch mode instead of performing this task online. Doing so frees up your terminal during processing.

Interactive Versus Batch Group Revalidation

You can revalidate a single group through the **Revalidation** option in the Group Edit panel. Any changes to the group population that RECOVERY MANAGER detects are shown together with a recommendation for the disposition of each item reported. You must revalidate groups interactively one at a time.

Note: Volume groups cannot be revalidated online. You must use batch revalidation.

You can revalidate many groups concurrently when you use batch revalidation. Doing so allows you to revalidate routinely and to receive a report from which you can ascertain whether maintenance must be performed on groups saved in the RECOVERY MANAGER repository.

Using SMF (System Management Facilities) data and AR/CTL imports requires special consideration. When building a group using SMF, BMC Software strongly recommends using an extract file for running MRMBSMF to avoid contention with the system.

See “Working with SMF Data” on page 3-10 and “Working with AR/CTL Imports” on page 3-13 for more information about these groups.

Interactive Versus Batch JCL Generation

Using the interactive (online) method, you can generate backup and recovery JCL starting with the **Application groups** or **Appl. group definitions** items on the Main Menu. You can specify recovery points, select recovery options at the group level, and revalidate the current group when necessary. Apart from providing a job statement for the generated recovery job, you are not required to code any JCL. See “Generating JCL for a Recovery to a Point in Time” on page 5-12.

Using the batch method of generating recovery JCL can significantly shorten or eliminate a TSO session as follows:

- You can use the online support provided by RECOVERY MANAGER to automatically create JCL that you can execute to produce a recovery job. This approach requires only a short TSO session.
- You can completely avoid using a TSO session when you code your own JCL and use the MRMBGEN program to create a recovery job. However, you cannot change the values of recovery options when you use MRMBGEN. The values used in the recovery job are those in effect for the target group when the MRMBGEN job runs.

In addition to releasing the RECOVERY MANAGER online interface for other work, MRMBGEN provides better automation for point-in-time recovery following an application failure and more automation for disaster recovery preparation. It also supports coordinated recovery management.

See “Batch Recovery Job Generation” on page 5-19 for more information.

Repository Availability Considerations

As soon as possible after installing RECOVERY MANAGER, make backups of the objects in the RECOVERY MANAGER repository. Continue to make backups at intervals compatible with the practices at your site. Use the backup feature available through the **System Resources** option on the Main Menu to generate JCL.

Appendix A RECOVERY MANAGER Control File

A customized installation data set is created when the RECOVERY MANAGER for OS/390 product is installed from the SIS distribution tape. This data set contains all jobs required to install RECOVERY MANAGER into your specific MVS or OS/390 environment. One of these jobs is used to establish the initial control information for RECOVERY MANAGER. The member name is MRM\$OPTS. RECOVERY MANAGER needs to reference the MRM\$OPTS DD in both batch and online programs.

You can update the control information through the **Control information** option on the RECOVERY MANAGER Main Menu. You can also update this information by editing the MRM\$OPTS member of the .CNTL installation data set, shown on the following pages. In addition, you can set up any number of control information files as needed by your site.

You need MVS data set **Read** and **Write** authority to edit the MRM\$OPTS file.

The control file also contains sample recovery JCL (MRMRECVR) that you can use for recovering system resources. Use it to recover one repository from another, or to recover one RASCAT from another.

Control Information

The following table shows the type of information contained in the MRMSOPTS file for the following:

- MVS resources required by RECOVERY MANAGER
- other BMC Software products you may have installed
- SMF data used by RECOVERY MANAGER
- ABARS control data set used by RECOVERY MANAGER
- user step libraries used by RECOVERY MANAGER
- RECOVERY MANAGER data set information

This is the same information that you can access through the **Control information** option on the RECOVERY MANAGER Main Menu.

Note: You must provide both a load library and a version for products you have installed. Leave both the load library and the version fields blank for products that you do not have installed.

Table A-1 TSO, System, and User Information

Resource	Comments
ARCIVE1= ARCIVE2= ARCIVE3=	names of three pseudo VOLSERS for archived data sets (6 characters)
ARCLOAD=	names the APPLICATION RESTART CONTROL load library
ARCTLDATA=	names the APPLICATION RESTART CONTROL data file
ARCVRSN=	names the version of AR/CTL used. Can be blank or a valid integer, such as 200 for version 2.0
FDRLOAD=	names the Fast Dump Restore (FDR) load library; can be blank

Table A-1 TSO, System, and User Information

FDRVRSN=	names the version of FDR used. Can be blank or a valid integer, such as 520 for version 5.2
ICFRULOAD=	names the ICFRU load library; can be blank
JCARD1=//&UID&#JOB(PARM),JOB&##,CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID JCARD2=//* JCARD3=//* JCARD4=//* JCARD5=//*	one to five card images of JOB statement
JCLOUT=BMCCRR.ARM.&SSID(&SSID\$####)	batch JCL generation output data set (including member name if partitioned) (44 characters)
MINREPVR=	specifies the minimum version of the RMGR repository (3 digits)
PCTPRIME=	percentage of allocation to use for primary (3 digits, 010 to 100)
RASCAT1= RASCAT2=	VSAM cluster name of first and second copies of RASCAT (required)
RASCATBK1= RASCATBK2= RASCATBK3= RASCATBK4=	prefix of the copies of backups for RASCAT. Only RASCAT1 is required.
REPO1= REPO2=	VSAM cluster name of first and second copies of the repository (required)
SCDS=	name of the ABARS control data set (up to 44 characters) (optional)
SIBLOAD= SIBCTRANS=	name of the RAMAC SnapShot load library and its C transient library. These are optional and are used for generating backup JCL using RAMAC SnapShot as the backup utility
SMFDATA= SMFEXTRACT=	name of the SMF data and extract files (up to 44 characters) (optional)
USRLIB1= USRLIB2= USRLIB3=	names of the three user step libraries (up to 44 characters) (optional)

Table A-1 TSO, System, and User Information

VRULOAD= VRUVRSN=	RECOVERY UTILITY for VSAM load library (up to 44 characters) and version (3 digits) (optional)
WORKUNIT=SYSDA	name of disk for temporary work data sets (8 characters) (required)
XBMLOAD= XBMVRSN=	EXTENDED BUFFER MANAGER (XBM) load library (up to 44 characters) and version (3 digits) (optional) (used with SCV)

Following is a sample of the MRM\$OPTS file.

```
000001 ARCIVE1= PACMAN
000002 ARCIVE2=
000003 ARCIVE3= ??????
000004 JCARD1=//&UID&# JOB (PARM),RMGR,CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID
000005 JCARD2=//* =====
000006 JCARD3=//*
000007 JCARD4=//*
000008 JCARD5=//*
000009 JCLOUT=BMCCRR.ARM.&SSID(&SSID&####)
000010 JOBOUT=BMCCRR.ARM.LISTR
000011 WORKUNIT=SYSDA
000012 SCDS=CSG.SMS.SCDS
000013 SMFDATA=CSG.SMFDUMP.DAILY
000014 SMFEXTRACT=RDH.SMFDUMP.EXTRACT
000015 ARCTLDATA=BMCARV.QA.ARCMRMCF
000016 ARCVRSN=200
000017 ARCLOAD=BMCAES.V20.PSQA.LOAD
000018 VRUVRSN=110
000019 VRULOAD=BMCRUV.SYS2.RUV11.LOAD
000020 XBMVRSN=410
000021 XBMLoad=BMXBM.V41TEST.LOAD
000022 USRLIB1=CSG.CICS410.SDFHEXCI
000023 USRLIB2=
000024 USRLIB3=
000025 PCTPRIME=
000026 MRMSLIB=BMCMRM.V110TEST.SLIB
000027 RASCAT1=BMCMRM.V110.RASCAT1
000028 RASCAT2=BMCMRM.V110.RASCAT2
000029 RASCATBK1=BMCMRM.RASCATB1
000030 REPO1=BMCMRM.V110.REPO1
000031 REPO2=BMCMRM.V110.REPO2
000032 SIBLOAD=RAMAC.SNAPSHOT.LOAD
000033 SIBCTRANS=RAMAC.SNAPSHOT.CTRAN
000034 RASCATBK2=BMCMRM.RASCATB2
000035 RASCATBK3=BMCMRM.RASCATB3
000036 RASCATBK4=BMCMRM.RASCATB4
000037 ICFRULOAD=CSGI.ICFRU.V1R0.SICFMOD
000038 FDRLOAD=CSG.FDR.R52.LOADLIB
000039 FDRVRSN=520
000040 MINREPVR=110
```

Figure A-1 Sample MRM\$OPTS File

Appendix B RECOVERY MANAGER Messages and Codes

This appendix lists return codes and messages issued by RECOVERY MANAGER for OS/390 and RECOVERY MANAGER *for DB2** including explanations and suggested user responses. It also tells you where you can find information on other messages that may be received by a CRM™ user.

Return Codes.	B-2
Messages 27000 through 27999	B-2
Messages 76000 through 76999	B-2
Messages 80200 through 81199	B-3

The messages in the ranges 27000 through 27999 and 80200 through 81199 are also available online in members CRRvrmm and MRMvrmm respectively of the H*****.MSG installation data set.

Return Codes

The following return codes indicate the completion status of RECOVERY MANAGER:

Table B-1 Completion Status Return Codes

Return Code	Completion Status
0	RECOVERY MANAGER execution was successful. No warnings or errors were issued.
4	RECOVERY MANAGER execution was successful, but warnings were issued.
8	RECOVERY MANAGER execution failed because of some error related to the parameters you specified in the utility command or in the JCL.
12	RECOVERY MANAGER execution failed because of an error received from the system or from DB2. Errors include DB2 Call Attachment Facility (CAF) errors, unexpected nonzero SQLCODEs, and data set open errors.
16	RECOVERY MANAGER execution failed because an error occurred while the utility was trying to load one of its modules. Incorrect installation of RECOVERY MANAGER may cause this error.

See “ICF Catalog Maintenance” on page 6-16 for exceptions to the standard return codes.

Messages 27000 through 27999

Messages in this range are issued by COORDINATED RECOVERY MANAGER for MVS. See BMC Software’s *COORDINATED RECOVERY MANAGER for MVS User Guide* for more information.

Messages 76000 through 76999

Messages in this range are issued by RECOVERY MANAGER for IMS. See BMC Software’s *RECOVERY MANAGER for IMS User Guide* for more information.

Messages 80200 through 81199

This section includes messages that may be issued by RECOVERY MANAGER for OS/390 and RECOVERY MANAGER for DB2* as follows:

- in a noncoordinated recovery environment:
 - when you perform interactive tasks through the RECOVERY MANAGER user interface

In this case, explanations are available online.

- when you perform batch tasks

In this case, the messages are sent to the print output file.

- in a coordinated recovery environment, in which case they may be returned to the CRM user or to the appropriate print output file

Error message numbers that are followed by an E require corrective action before processing can continue. Warning message numbers are followed by a W and denote a possible error situation that does not prevent processing from continuing. Informational message numbers are followed by an I and require no action.

BMC80201E

UNKNOWN LISTGEN TYPE

Explanation: This is an internal error.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80202E

DYNAMIC LOAD FAILED UNABLE TO LOAD module

Explanation: Unable to load the module named.

User Response: Check the load libraries in the JOBLIB or STEPLIB. Add the necessary library.

BMC80203E

INVALID FUNCTION CODE code, VERSION version

Explanation: The program was called with a function code that was not recognized. The function code is shown in the message. This may be an internal program error, or it may indicate that the calling program is not at a level compatible with the called function.

User Response: Check the load libraries being used to ensure that they are the appropriate versions. If you suspect a program problem, contact your BMC Software product support representative.

BMC80298I REBUILD REQUIRED DUE TO condition

Explanation: The index shown was eligible for recovery from image copy, but a rebuild is required due to the condition shown.

System Action: Recovery elapsed time may be slower.

BMC80299I REBUILD REQUIRED FOR INDEX index

Explanation: The index shown was eligible for recovery from image copy, but a rebuild is required due to a condition encountered.

User Response: Refer to message BMC80298 for the reason for the rebuild. Recovery elapsed time may be slower.

BMC80300E CAF ERROR: RC = rc REASON = reason

Explanation: An error occurred during a DB2 Call Attach Facility command. The return code and reason are shown in the message.

User Response: See the *IBM DB2 Messages and Codes* manual for more information.

BMC80301E SQL ERROR: SQLCODE=sqlcode STMTID=stmtid, DBRM=dbrm

Explanation: An unexpected SQL error occurred during execution of an SQL statement. DB2 error messages follow this message.

User Response: See the *IBM DB2 Messages and Codes* manual for more information about the DB2 messages.

BMC80302E UNABLE TO CONNECT TO DB2 SSID = ssid

Explanation: RECOVERY MANAGER was unable to connect to DB2 through the Call Attach Facility. Call Attach Facility error information messages will follow. If the error was issued when you attempted to run ARMBSTR, the target DB2 subsystem may be inactive.

User Response: See the *IBM DB2 Messages and Codes* manual for more information about the Call Attach Facility messages.

BMC80303E DISCONNECT FAILED SSID = ssid

Explanation: RECOVERY MANAGER was unable to disconnect from DB2 through the Call Attach Facility. Call Attach Facility error information messages will follow.

User Response: See the *IBM DB2 Messages and Codes* manual for more information about the Call Attach Facility messages.

BMC80304E PLAN OPEN FAILED – PLAN NAME `planname`

Explanation: RECOVERY MANAGER was unable to open the DB2 plan through the Call Attach Facility. Call Attach Facility error information messages will follow.

User Response: See the *IBM DB2 Messages and Codes* manual for more information about the Call Attach Facility messages.

BMC80305E PLAN CLOSE FAILED – PLAN NAME `planname`

Explanation: RECOVERY MANAGER was unable to close the DB2 plan through the Call Attach Facility. Call Attach Facility error information messages will follow.

User Response: See the *IBM DB2 Messages and Codes* manual for more information about the Call Attach Facility messages.

BMC80306E MESSAGE RETRIEVAL FAILED RC = `rc` FROM DSNTIAR

Explanation: A previous SQL error occurred, but the DB2 messages related to it could not be retrieved through DSNTIAR.

User Response: Check for related previous messages and then contact your BMC Software product support representative for RECOVER PLUS.

BMC80307E UNSUPPORTED DB2 VERSION `vr`

Explanation: RECOVERY MANAGER does not support the version of DB2 installed.

User Response: Install a supported version of DB2. RECOVERY MANAGER supports DB2 Version 3 or later.

BMC80308I CHANGELIMIT IGNORED TRACKMOD NO SPACE REQUIRES FULL COPY DSN=`dsn`

Explanation: A partition or table space created with the TRACKMOD NO option requires a full copy.

System Action: The CHANGELIMIT option will be ignored and JCL will be generated to create a full copy.

BMC80314W RU FOR VSAM UNAVAILABLE dataset NOT PROCESSED

Explanation: RUV is specified as the utility for the named data set but the RUV subsystem is not available so the data set will not be processed.

User Response: If you wish to use RUV, select an active subsystem.

BMC80315 UNABLE TO LOCATE CHECKPOINT PRIOR TO checkpoint FOR MEMBER member

Explanation: (This message applies to both RECOVERY MANAGER for OS/390 and RECOVERY MANAGER for DB2*.)

When doing INDOUBT analysis, MRMBSRR (applies to RECOVERY MANAGER for OS/390) or ARMBBSRR (applies to RECOVERY MANAGER for DB2*) was unable to locate the last check point prior to the RBA or LRSN shown. It also indicates the member number, which is of interest for data sharing.

User Response: You may need to establish a new recovery point. Follow the procedures documented in the *RECOVERY MANAGER for OS/390 User Guide* for running MRMBSRR.

Follow the procedures in the *RECOVERY MANAGER for DB2* User Guide* for running ARMBBSRR. Collect a Print Log Map report for the subsystem or member, along with the ARMBBSRR output and contact your BMC Software product support representative if you suspect a program error.

BMC80316E SELECT RECOVERY POINT BEFORE GENERATING JCL

Explanation: You requested recover JCL generation, but a recovery point has not been selected. You must select a recovery point at least once, and you must select a recovery point again after generating recover JCL or editing utility options.

User Response: Use option 1 to select a recovery point.

BMC80317E DFDSS REQUIRED FOR RASCAT BACKUP UTILITY

Explanation: The backup utility for RASCAT must be DFDSS. You may not select another utility.

User Response: Select DFDSS as the utility.

BMC80318E XBM VERSION version DOES NOT SUPPORT OPTION

Explanation: The XBM version contained in the Control Information does not support the option selected. If the version shown is 000, the version is not set in the Control Information.

User Response: Do not use the option selected or change the XBM version in the Control Information if needed.

BMC80319W utility options VIA utility NOT SUPPORTED FOR DATA TYPE type

Explanation: The utility options selected for data set: dsname specify an invalid utility for this action. The action will not be performed for this data set.

User Response: Select a set of utility options with a valid utility for this action.

BMC80320W**BMC UTILITY VERSION LOW FOR DB2 VERSION vr**

Explanation: The BMC Software utility shown is at a level that is lower than the minimum required to support the named version of DB2. An attempt to generate JCL using that utility will cause RECOVERY MANAGER to use DSNUTILB instead.

User Response: Review the DB2 and RECOVERY MANAGER control information. Upgrade the installed BMC Software utilities where necessary.

DB2 Version 4 support requires CHECK PLUS 1.4.00, PACLOG 1.1.01, COPY PLUS 4.3.00, and RECOVER PLUS 2.2.00 or higher. PACLOG 1.1.02 and RECOVER PLUS 2.3.00 or higher are required for data sharing.

DB2 Version 5 support requires CHECK PLUS 2.1.00, COPY PLUS 5.3.00, PACLOG 1.2.00, and RECOVER PLUS 2.4.00 or higher. COPY PLUS 5.4.00 or higher is required for large partition support.

See “Software Requirements” on page 1-17 in the product user guide for more information.

BMC80321I**DSNUTILB SUBSTITUTED FOR utility ON object**

Explanation: RECOVERY MANAGER specified DSNUTILB instead of the BMC Software utility shown to process the named object. The BMC Software utility is at a level that is lower than the minimum required to support this version of DB2.

User Response: Review the DB2 and RECOVERY MANAGER control information. Upgrade the installed BMC Software utilities where necessary.

DB2 Version 4 support requires CHECK PLUS 1.4.00, COPY PLUS 4.3.00, and RECOVER PLUS 2.2.00 or higher. RECOVER PLUS 2.3.00 or higher is required for data sharing.

DB2 Version 5 support requires CHECK PLUS 2.1.00, COPY PLUS 5.3.00, PACLOG 1.2.00, and RECOVER PLUS 2.4.00 or higher. COPY PLUS 5.4.00 or higher is required for large partition support.

See “Software Requirements” on page 1-17 in the product user guide for more information.

BMC80322I**DSNUTILB SUBSTITUTED FOR AFRMAIN ON object**

Explanation: Recovering the named object requires a DFSMS concurrent copy. RECOVERY MANAGER will use DSNUTILB to perform the recovery instead of using RECOVER PLUS. The installed version of RECOVER PLUS does not support DFSMS concurrent copies.

User Response: This message is for information only. No action is required.

BMC80323E COPY TYPE NOT SUPPORTED FOR USE BY AFRMAIN

Explanation: The installed version of RECOVER PLUS does not support DFSMS concurrent copies.

User Response: Perform one of the following actions, and then try again:

- Select another recovery point.
- Change the recover utility to DSNUTILB by editing the utility options in force for this object.

BMC80324I MULTI JOB NOT ALLOWED WITH SPECIFIED VERSION OF AFRMAIN

Explanation: Multiple job optimization is not supported for the installed version of RECOVER PLUS. Early versions of RECOVER PLUS can encounter synchronization problems when they are split into multiple jobs.

User Response: To support multiple job optimization, install RECOVER PLUS Version 2.2.00 or later.

BMC80325I MULTI JOB NOT ALLOWED WITH THIS VERSION OF DB2

Explanation: This version of DB2 does not support partition independence, which may be needed for multiple job optimization. A single job will be generated.

User Response: This message is for information only. No action is required.

BMC80326E ALLOCATION FAILED FOR file.ECODE=ecode, ICODE=icode

Explanation: Allocation of the file shown failed.

User Response: Look up the ECODE and ICODE to determine the cause of the failure. The codes are documented in the *IBM Macro Instructions for Data Sets* or the equivalent manual.

BMC80327E FILE I/O ERROR FOR DDNAME file. RC=rc

Explanation: An I/O error occurred for the file shown. For VSAM data sets, the return code is the negative VSAM return code (register 15).

Return code 8 is a logical error. Return code 12 is a physical error. The specific error is indicated in the RPL feedback area.

User Response: Look up the return code to determine the cause of the failure. The codes are documented in the *IBM Macro Instructions for Data Sets* or the equivalent manual.

BMC80328I ERROR DURING operation. REASON=reason

Explanation: An I/O error occurred for the operation shown. For VSAM data sets, the reason is the VSAM RPL feedback code.

Reason code 8 is duplicate record. Reason code 16 is record not found.

User Response: Look up the reason code to determine the cause of the failure. The codes are documented in the *IBM Macro Instructions for Data Sets* or the equivalent manual.

BMC80329I BMC RU IS NOT AVAILABLE

Explanation: Program RUVZAPI could not be loaded. RECOVERY MANAGER cannot access information from BMC Software's RECOVERY UTILITY for VSAM (RUV) required to complete the requested action.

User Response: If you do not have RUV installed, ensure that the VRULOAD and VRUVRSN in MRM\$OPTS are not set. If you do have RUV installed, ensure that its load library is contained in the STEPLIB concatenation for RECOVERY MANAGER, or include RUV in the same load library as RECOVERY MANAGER, or make RUV available through systems services such as Library Lookaside (LLA).

BMC80330I ERROR DURING BMC RU API FUNCTION function. REASON=reason

Explanation: An error occurred when accessing the RECOVERY UTILITY for VSAM (RUV) application interface which is program RUVZAPI.

User Response: Verify that the desired subsystem for RUV is active.

BMC80331I BMC SUBSYSTEM NOT ACTIVE OR DOES NOT EXIST

Explanation: The subsystem specified for the RECOVERY UTILITY for VSAM (RUV) was not found or is not active.

User Response: Select another subsystem name. You may use the BMC Subsystems option on the main menu to view available subsystems.

BMC80332I BMC SUBSYSTEM SELECTED

Explanation: The profile variable for the selected RECOVERY UTILITY for VSAM (RUV) subsystem has been set.

User Response: This message is for information only. No action is required.

BMC80333I AUTHORIZATION CHECK FOR USERID userid

Explanation: The user ID was being processed when an error was detected.

User Response: See message BMC80335I.

BMC80334I DATASET=dataset,VOLUME=volume

Explanation: The data set and volume were being processed when an error was detected.

User Response: See message BMC80335I.

BMC80335I MRM RC=rc,SAF RC=rc,RACF RC=rc,RACF REASON=reason

Explanation: A non-zero MRM return code indicates an unexpected internal error.

User Response: Look up the return codes and reason codes in the *IBM RACF External Security Interface (RACROUTE) Macro Reference* or equivalent manual.

BMC80336I RASCAT CLEANUP FOR *creator.name*, RETNPD=retention period, RC=rc

Explanation: RASCAT clean-up has been performed for the group shown.

System Action: Backups older than the number of days indicated by the RASCAT retention period were deleted if RC < 4. If RC > 4. See other messages following to indicate the problem. The retention period comes from the Utility Options for the group and system.

BMC80337W UNABLE TO OBTAIN SIZING FOR data set

Explanation: The SIZING YES option was selected to obtain a volume usage report, but sizing information could not be obtained for the data set shown. Possible causes of the problem are that the data set is archived or VTOC information is inaccessible. There may be other causes. The message is a warning that sizing information is incomplete.

User Response: Determine why the sizing information is not available. Correct the situation if possible.

BMC80338E BACKUP NAME ERROR NO MATCH WITH CONTROL INFO DS NAMES

Explanation: Prior to generating backup JCL for the RASCAT, the backup names specified in the Utility Options were examined, and no match was found with the names specified by the Control Information RASCATBK1, RASCATBK2, RASCATBK3, or RASCATBK4. There must be at least one backup data set with a name matching one of those options. DFDSS will be the backup utility used. Otherwise, RMGR will not be able to locate the backups for recovery.

RASCATBK1=%s
RASCATBK2=%s
RASCATBK3=%s
RASCATBK4=%s

User Response: Edit the utility options to give at least one of the backups a name matching the Control Information, or edit the Control Information to add or update it with the desired data set name.

BMC80339I BACKUP ANALYSIS BYPASSED DUE TO TYPE FOR data set

Explanation: MRMBGPV performs analysis of recovery resources for data sets which are VSAM clusters, user catalogs, or non-VSAM. The data set shown was not one of those types, so no analysis or reporting will be performed for it. This includes the following types of reports: RECOVERABILITY, RESOURCES, RECALL, and PICKLIST.

User Response: The message is for information only. No action required.

BMC80340E CANNOT MIX REGISTER AND UNREGISTER COMMANDS

Explanation: MRMBREG does not allow REGISTER and UNREGISTER commands in the same execution.

User Response: Put the REGISTER commands into one step and the UNREGISTER commands into another step.

BMC80341I NO BMC SUBSYSTEMS ENABLED FOR RU

Explanation: There are no subsystems enabled for the RECOVERY UTILITY . At least one subsystem must be enabled for RUV to make a selection.

User Response: Enable the desired subsystem.

BMC80342W INCOMPLETE LIST ADDITIONAL ENTRIES ARE NOT INCLUDED

Explanation: The requested list reached the maximum allowed size and further additions could not be made. At least one entry was not added to the list.

User Response: Use a less generic search if possible.

BMC80343I A REPOSITORY OR RASCAT IS NOT FUNCTIONAL - PROCESSING CONTINUES

Explanation: One of the repository or RASCAT data sets was not functional but the dual file is functional. Processing continues with the available file.

User Response: See the BMC80326E message for details about the failure.

BMC80344I BMC AR/CTL INTERFACE IS NOT AVAILABLE

Explanation: Program AESMRM00 could not be loaded. RECOVERY MANAGER cannot process get and hold requests.

User Response: If you do not have AR/CTL installed, ensure that the ARCLoad and ARCVRSN in MRM\$OPTS are not set. If you do have AR/CTL installed, ensure that its load library is contained in the STEPLIB concatenation for RECOVERY MANAGER for OS/390, or include AR/CTL in the same load library as RECOVERY MANAGER for OS/390, or make AR/CTL available through systems services such as Library Lookaside (LLA).

BMC80345E ERROR DURING BMC AR/CTL INTERFACE FUNCTION function. REASON=reason

Explanation: An error occurred when accessing the BMC APPLICATION RESTART CONTROL (AR/CTL) interface, which is program AESMRM00.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80346E dataset DATASET NAME NOT SET IN MRM\$OPTS

Explanation: The named data set is not found in the .CNTL data set.

User Response: Verify that the REPO1, REPO2, RASCAT1, and RASCAT2 options are set with the correct dataset names in the MRM\$OPTS member of the RECOVERY MANAGER for OS/390 .CNTL dataset.

BMC80347E ERROR DURING BMC AR/CTL INTERFACE FUNCTION function. REASON=reason

Explanation: An error occurred when accessing the BMC APPLICATION RESTART CONTROL (AR/CTL) interface which is program AESMRM00.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

- BMC80348I** **&VOL REQUIRED IN OUTPUT DATA SET OPTIONS FOR FDR**
- Explanation:* If you choose FDR as the backup utility, the &VOL substitution variable is required in the copy data set name pattern in the utility Output Data Set Options. Failure to do this will cause unpredictable results when executing the FDRDSF job.
- User Response:* Add the &VOL substitution variable to the copy data set name pattern in the utility Output Data Set Options.
- BMC80349I** **NO ADEQUATE BACKUP REGISTERED FOR OBJECT(S) SINCE LAST OPENED FOR UPDATE**
- Explanation:* No backup for the object has been registered since the last update.
- User Response:* The message is for information only. No action required.
- BMC80350I** **dataset NOT ADDED TO THE LIST**
- Explanation:* A dataset name was found to be a duplicate or uncataloged during volume group processing. It will not be included in the group and processing continues.
- User Response:* The message is for information only. No action required.
- BMC80351I** **VOLUME = volume DSN = dataset name**
- Explanation:* Volume and data set referenced in message BMC80350I.
- User Response:* The message is for information only. No action required.
- BMC80870E** **INVALID TIMESTAMP FORMAT MUST BE 'YYYY-MM-DD-HH.MM.SS'**
- Explanation:* The time stamp is in an incorrect format.
- User Response:* Correct the time stamp format to correspond with the following:
- YYYY indicates the year (1989-2099)
MM indicates the month of the year (01-12)
DD indicates the day of the month (01-31 and valid)
HH indicates the hour (00-23)
MM indicates the minutes (00-59)
SS indicates the seconds (00-59)
- Components may be separated by a hyphen, period, or colon.

BMC80398W NO LOG RANGES – CHECK THAT ICOPY HAS BEEN RUN SINCE LAST BIND

Explanation: No log ranges were found for the selected objects. It is likely that the DB2 plan *plan_name* has been bound or rebound since the last execution of the ARMssidC installation job.

User Response: Run the ARMssidC installation job, or run the REPORT RECOVERY utility to verify whether log ranges exist for the object.

BMC80399E PLAN *planname* BOUND SINCE LAST EXECUTION OF ARMssidC INSTALLATION JOB

Explanation: No log ranges were found for the selected objects. It is possible that the DB2 plan *plan_name* has been bound or rebound since the last execution of the ARMssidC installation job.

User Response: Run the ARMssidC installation job.

BMC80400W NO MATCHES FOUND

Explanation: RECOVERY MANAGER could not find any objects that match the list generation criteria.

User Response: Check the spelling and the pattern you specified for the list.

BMC80401E MISSING WILD CARD

Explanation: List Generation Services was called to produce a list of names matching a name pattern. The name pattern did not contain a wildcard character. This is an internal program error.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80402E TABLESPACE NOT FOUND – *db.ts* NOT IN DB2 CATALOG

Explanation: List Generation Services was called with a table space name that was not found in the DB2 catalog.

User Response: Check the spelling of the name. If it is correct, the table space may have been dropped.

BMC80403W NO JCL GENERATED FOR *object*. REASON: *reason*

Explanation: No JCL will be generated for the named object for the reason given. RECOVERY MANAGER continues processing.

User Response: No action is necessary unless you want to generate JCL for the named operation. If you want to generate the JCL you must take appropriate action and run the job again.

BMC80404E INVALID VSAM CLUSTER – CANNOT ALTER NAME FROM vcat

Explanation: RECOVERY MANAGER found an invalid VCAT name. The expected name is shown in the message.

User Response: When you specify a new VSAM cluster, use the same VCAT name as the old VSAM cluster name.

BMC80405E REQUIRES PACLOG – COMPRESS YES INVALID FOR ARMBARC

Explanation: COMPRESS YES can only be selected if PACLOG has been selected as the restore program.

User Response: Use COMPRESS NO, or change the program to PACLOG and then select COMPRESS YES.

BMC80406E SELECT ONE GROUP ONLY ONE ABARS GROUP MAY BE SELECTED

Explanation: A RECOVERY MANAGER group can contain only one ABARS aggregate group. Processing will not continue until only one group is chosen.

User Response: Redefine the RECOVERY MANAGER group so that it contains only one ABARS group.

BMC80407E SELECTION DS ERRORDSN=data set

Explanation: An error was detected in the named ABARS selection data set.

User Response: See subsequent messages for more detail.

BMC80408E SELECTION DS SYNTAX ERROR error

Explanation: The selection data set named in prior messages contains the syntax error noted in the message. Processing cannot continue until the syntax error is corrected. See the *DFSMSHsm Storage Administration Guide* for more detail on the selection data set syntax.

User Response: Correct the syntax error.

BMC80409W NO BACKUPS DELETED NO MATCHES FOUND IN RASCAT

Explanation: A request to delete backups from RASCAT was issued, but no records were deleted because none matched the specified criteria.

User Response: Check your criteria and submit again if needed.

BMC80410E NO ABARS BACKUP ANALYSIS DONE FOR DSN=dsname

Explanation: RECOVERY MANAGER was unable to perform a backup analysis for the named data set.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80411 text TAPE UNIT REQUIRED text

Explanation: The unit specified must be a tape unit of the following type:

- 3400
- 3480
- 3480X
- 3490
- 3590

User Response: If a disk unit is specified, then 80411E is issued and you must re-specify a valid tape unit. If an unrecognized unit is specified, then 80411W is issued and you must ensure that the value specified has been defined to ABARS via the SETSYS USERUNITTABLE command. Processing can continue.

BMC80419E n LRECL IS NOT VALID LRECL IS n MUST BE m

Explanation: The LRECL of the data set is not valid.

User Response: Change it to the value shown.

BMC80420E IDCAMS INPUT ERROR RC = rc

Explanation: A nonzero return code was received while building IDCAMS control statements. This is generally an internal program error.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80421E NO OUTPUT FROM IDCAMS – DATA SET INFORMATION NOT FOUND

Explanation: The output buffer was empty following an IDCAMS request. This is generally an internal program error.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80422E IDCAMS ERROR RC = rc

Explanation: A nonzero return code was received after invoking IDCAMS.

User Response: Review related messages for the cause of the problem. Then take appropriate action to rectify the problem.

BMC80423E **message text**

Explanation: The message shown was issued by IDCAMS.

User Response: Review any accompanying messages. Refer to the *MVS System Messages* manual for further information about IDCAMS error messages.

BMC80424X **NO ICF DATA FOR dsname**

Explanation: RECOVERY MANAGER was unable to retrieve information from the ICF catalog for the named data set. Processing continues as feasible without the information. Error message 80424E will be issued if RECOVERY MANAGER cannot continue processing, otherwise 80424W is issued.

User Response: If the message is received when running the ARMBSRR program (with RECOVERY MANAGER for DB2*) or the MRMBBSRR program (with RECOVERY MANAGER for OS/390), verify that the named data set exists and is not archived.

If the message is received when you are using the RECOVERY MANAGER online interface and it is not accompanied by an error message, no action is required.

BMC80425E **GROUP NOT SAVED REQUESTED PROCESS CANNOT BE DONE**

Explanation: The group must be saved before the requested process can be done.

User Response: Save (or Save As) the group when selecting this process.

BMC80426W **GROUP SAVE ERRORS REQUESTED PROCESS MAY BE INCOMPLETE**

Explanation: The group save process encountered errors. The group may not be complete.

User Response: Check accompanying messages to diagnose the problem.

BMC80427I **number AR/CTL RECORDS MATCHED CRITERIA FOR GROUP
creator.name**

Explanation: The number of AR/CTL records shown matched the group selection criteria.

User Response: The message is for information only. No action required.

BMC80428I **number RECORDS WERE READ FROM THE AR/CTL FILE**

Explanation: The number of AR/CTL records shown were read from the AR/CTL file.

User Response: The message is for information only. No action required.

BMC80429I DATASETS MATCHING CRITERIA FOR GROUP *group.name*

Explanation: The listed data sets match the search criteria.

User Response: No action required.

BMC80430I message text

Explanation: This is an informational message.

User Response: No action required.

BMC80431I DATASET data set ADDED TO GROUP

Explanation: This is an informational message, displayed when Print Hits is selected for SMF scan.

User Response: The message is for information only. No action required.

BMC80432I SOME REVALIDATION WILL NOT BE DONE. ONLY ADDITIONS WILL SHOW.

Explanation: Groups built with SMF scan or AR/CTL scan should be rebuilt with their respective batch jobs to achieve full validation.

BMC80433I number RECORDS READ FROM SMF INPUT

Explanation: This is an informational message, displayed when Print Hits is selected for SMF extract.

User Response: The message is for information only. No action required.

BMC80434I variable TYPE variable RECORDS EXTRACTED

Explanation: This is an informational message, displayed when Print Hits is selected for SMF extract.

User Response: The message is for information only. No action required.

BMC80435I number RECORDS EXTRACTED FROM SMF INPUT

Explanation: This is an informational message, displayed when Print Hits is selected for SMF extract.

User Response: The message is for information only. No action required.

BMC80436I	DFSMSHsm IS <i>text</i> <i>Explanation:</i> This is an informational message, displayed when Print Hits is selected for SMF extract. <i>User Response:</i> The message is for information only. No action required.
BMC80437I	COMMAND COMPLETE RETURN CODE = <i>code</i> RESPONSE CODE= <i>code</i> <i>Explanation:</i> The command completed with the specified return code. <i>User Response:</i> If the return code is zero, the command completed with no warnings or errors. If the return code is not zero, check DFSMSHsm for error messages. For Recover, see ARC11nnI messages. For Backup, see ARC13nnI messages where nn is the return code.
BMC80490E	DUPLICATE ENTRY <i>Explanation:</i> The field at the cursor position is a duplicate. <i>User Response:</i> Correct the information at the current cursor position and then press Enter .
BMC80491E	NOT VALID FOR ONLINE LISTING BY CATALOG MUST BE DONE IN BATCH <i>Explanation:</i> Online LISTCAT by CATALOG is not allowed due to the potential of long response times. <i>User Response:</i> Select the batch processing option.
BMC80492E	DATASET NOT VALID <i>error</i> <i>Explanation:</i> The dataset at the cursor could not be located or is not the correct type of dataset. <i>User Response:</i> Correct the information at the current cursor position.
BMC80493I	MINREPVR INVALID DEFAULTING TO <i>default</i> <i>Explanation:</i> The MINREPVR option in the Control Information is not valid. <i>User Response:</i> Correct the MINREPVR option in the Control Information.
BMC80494I	NO C.D.R. POINT TO ESTABLISH <i>Explanation:</i> No C.D.R. point with NULL RBA was found in the table. <i>User Response:</i> Verify that the process to insert C.D.R. point has been run.

BMC80495E

CANNOT VALIDATE ONLINE VOLUME RECOVERY GROUP WAS CREATED IN BATCH

Explanation: A volume recovery group created in batch cannot be validated online.

User Response: The group must be validated in batch using the MRMBGPV program.

BMC80496E

OPTIONS INIT FAILED.error

Explanation: An error occurred when XBM attempted to register a backup with RECOVERY MANAGER.

User Response: Verify that the RECOVERY MANAGER MRM\$OPTS file is allocated correctly to the job. Correct any errors found and resubmit the job.

BMC80497I

GROUP *creator.name*

Explanation: This is an informational message, displayed when Print Hits is selected for SMF scan.

User Response: The message is for information only. No action required.

BMC80498E

CANNOT MODIFY OPTIONS *creator.name* NOT AUTHORIZED

Explanation: Attempting to save the Utility Options, but none of the user's authorization IDs matched the group's creator or any IDs granted access to the Utility Options.

User Response: Obtain proper authorization from an authorized user. The creator or any authorized ID may grant access to other users or to PUBLIC.

BMC80499E

NOT AUTHORIZED TO OPEN OPTIONS *creator.name*

Explanation: Attempting to open the utility options, but none of the user's authorization IDs matched the option's creator or any IDs granted access to the options.

User Response: Obtain proper authorization from an authorized user. The options creator or any authorized ID may grant access to other users or to PUBLIC.

BMC80500E

NOT AUTHORIZED TO OPEN GROUP *creator.name*

Explanation: RECOVERY MANAGER attempted to open the group, but none of the user's authorization IDs matched the group creator or other IDs granting access to the group.

User Response: Obtain proper authorization from an authorized user. The group creator or any authorized ID may grant access to the group to other users or to PUBLIC.

BMC80501E GROUP NOT FOUND – NAME: creator.name

Explanation: RECOVERY MANAGER attempted to open the named group, but could not find it in the repository.

User Response: Check the spelling or use wildcard characters in the group name you specified in the Group List panel.

BMC80502E NO OBJECTS IN GROUP creator.name

Explanation: RECOVERY MANAGER attempted to open the named group, but no objects were found for it in the repository. *This is an unexpected condition.*

User Response: Delete the group.

BMC80503I GROUP UPDATED – THE GROUP WAS UPDATED SUCCESSFULLY

Explanation: The group has been updated with the changes noted in prior messages.

User Response: This message is informational. No further action is required.

BMC80504E NO CHANGES MADE – GROUP UPDATE FAILED

Explanation: An unsuccessful attempt was made to update the group with the changes noted in prior messages. The cause of the error is documented in messages issued prior to this one.

User Response: This is an unexpected condition. Correct the error, and attempt to update the group again.

BMC80505E OPTION NOT ALLOWED AS METHOD FOR ADDING OBJECTS

Explanation: You cannot use the selected option to add objects to an existing group.

User Response: Select another option.

BMC80506E OPTIONS NOT FOUND NAME: creator.name

Explanation: Attempting to open the options, but they were not found in the repository.

User Response: Check the spelling or use wild card characters in the name.

BMC80507E NOT VALID FOR TEMPLATE

Explanation: The action is not available for the option template. The template is not stored in the repository. It is available to use to build a new set of options.

User Response: Make another selection.

BMC80508I MISSING LOG(S) FOR LRSN limit TO limit FOR MEMBER member

Explanation: In a DB2 data sharing group, RECOVERY MANAGER could not find log records between the limits shown for the named data sharing group member.

User Response: This message is for information only. No action is required.

BMC80509I MISSING LOG(S) FOR LOGRANGE limit TO limit

Explanation: RECOVERY MANAGER could not find any log records between the limits shown.

User Response: This message is for information only. No action is required.

BMC80510I objectname DSNUM dsnum

Explanation: When performing a revalidation, RECOVERY MANAGER detected a problem with the named object. The problem is specified in the accompanying BMC Software messages (BMC80511 through BMC80519).

User Response: Examine the accompanying messages and determine whether any action is required.

BMC80511I OBJECT(S) NOT DEFINED TO DB2

Explanation: When performing a revalidation, RECOVERY MANAGER found that the objects named in BMC80510 were not defined to DB2.

User Response: See message BMC80510.

BMC80512I OBJECT(S) WITH INVALID PARTITION NUMBER

Explanation: When performing a revalidation, RECOVERY MANAGER found that the objects named in BMC80510 had invalid partition numbers.

User Response: See message BMC80510.

BMC80513I CATALOG OR DIRECTORY OBJECT(S)

Explanation: When performing a revalidation, RECOVERY MANAGER found that the objects named in BMC80510 were DB2 catalog or directory objects.

User Response: See message BMC80510.

BMC80514I SHARED READ ONLY OBJECT(S) OWNED BY OTHER SUBSYSTEM

Explanation: When performing a revalidation, RECOVERY MANAGER found that the objects named in BMC80510 were read-only objects owned by another DB2 subsystem.

User Response: See message BMC80510.

- BMC80515I NONCLUSTERING INDEX(ES) REQUIRE DSNUM ALL RECOVERY**
- Explanation:* When performing a revalidation, RECOVERY MANAGER found that the objects named in BMC80510 were nonclustering indexes. RECOVERY MANAGER will recover these indexes in a DSNUM ALL recovery.
- User Response:* See message BMC80510.
- BMC80516I OBJECT(S) WITH INVALID DATA SET NUMBER**
- Explanation:* When performing a revalidation, RECOVERY MANAGER found that the objects named in BMC80510 had invalid data set numbers.
- User Response:* See message BMC80510.
- BMC80517I NO ADEQUATE ENTRY IN SYSIBM.SYSCOPY FOR TABLESPACE(S)**
- Explanation:* When performing a revalidation, RECOVERY MANAGER found that the table spaces named in BMC80510 had no adequate entry in SYSCOPY.
- User Response:* See message BMC80510.
- BMC80518I MISSING RESOURCE(S) FROM MVS CATALOG**
- Explanation:* When performing a revalidation, RECOVERY MANAGER found that the resources named in BMC80510 were missing from the MVS catalog.
- User Response:* See message BMC80510.
- BMC80519I DATA SET LEVEL RECOVERY OR RECOVER PLUS REQUIRED FOR OBJECT(S)**
- Explanation:* When performing a revalidation, RECOVERY MANAGER found that the table spaces named in BMC80510 were copied by partition or data set and so cannot be recovered by DSNUTILB.
- User Response:* See message BMC80510.
- BMC80520I OBJECT(S) WITH LOG RANGES NOT COVERED BY AVAILABLE LOG(S)**
- Explanation:* RECOVERY MANAGER could find no log records for one or more objects.
- User Response:* This message is for information only. No action is required.

BMC80521-61I TABLESPACE PRT RESOURCE PRT DATE TIME VOLSER DSN

Explanation: Messages BMC80521I through BMC80561I are report elements used in the printed reports available from RECOVERY MANAGER. In these messages:

- *sitetype* has a value of either LOCAL or RECOVERY.
- *creator.name* is the name of a RECOVERY MANAGER group.

User Response: If more information is needed about RECOVERY MANAGER reports, see “Batch Revalidation and Reporting” on page 3-47 in the product user guide.

BMC80537E GROUP NOT SAVED REQUESTED PROCESS CANNOT BE DONE

Explanation: The group must be saved before the requested process can be done.

User Response: Save (or Save As) the group when selecting this process.

BMC80538W RELATED OBJECT - NOT RECOVERED - object

Explanation: An object related to the object shown in the message could not be recovered.

User Response: If you want to recover related objects, rebuild the group to include those objects.

BMC80539W status PRECLUDES RECOVERING - object

Explanation: The object shown in the message could not be recovered to the selected recovery point because the status (shown) was other than OK. If no objects in the target group are recoverable, the job fails.

User Response: See “Responding to Unsatisfactory Object Status” on page 3-41 for information about conditions that can prevent recovery and how to respond to them.

BMC80540I GROUP SAVED – THE GROUP WAS SAVED SUCCESSFULLY

Explanation: The current group has been successfully saved to the repository.

User Response: This message is for information only. No action is required.

BMC80541I NO CHANGES MADE – THE GROUP WAS NOT SAVED

Explanation: The current group was not saved in the repository because no changes to group were detected.

User Response: This message is for information only. No action is required.

BMC80542I GROUP DELETED – THE GROUP WAS DELETED SUCCESSFULLY

Explanation: The current group has been successfully deleted from the repository.

User Response: This message is for information only. No action is required.

BMC80543I GROUP DELETED – THE GROUP WAS DELETED SUCCESSFULLY

Explanation: The current group had not been saved in the repository. It has been deleted from memory.

User Response: This message is for information only. No action is required.

BMC80544I PERFORMING REVALIDATION FOR GROUP creator.name

Explanation: Batch group revalidation has been invoked for the group. Any changes to the object list will be noted.

User Response: This message is for information only. No action is required.

BMC80545I NO DIFFERENCES FOUND – THE GROUP HAS NOT CHANGED

Explanation: The current group population was revalidated against the criteria saved in the repository. No changes were detected between the current group population and the results of generating a new list from the stored criteria.

User Response: This message is for information only. No action is required.

BMC80546I DIFFERENCES DETECTED DURING REVALIDATION

Explanation: The current group population was revalidated against the criteria saved in the repository. Changes were detected between the current group population and the results of generating a new list from the stored criteria.

User Response: This message is for information only. You may want to revalidate and apply the changes to the current group.

BMC80547I objecttype objectname DSNUM dsnum

Explanation: The change is noted as an addition of a new object or the deletion of an existing object. The object type, two part name, and data set number are displayed.

User Response: This message is for information only. No action is required.

BMC80548I message text

Explanation: The change is noted as an addition of a new object or the deletion of an existing object.

User Response: This message is informational. No action is required.

BMC80549E INVALID CREATOR NAME creator.name – NOT SAVED

Explanation: RECOVERY MANAGER attempted to save a new group, but none of the user's authorization IDs matched the group's creator or PUBLIC. The group creator name must be PUBLIC or one of the user's DB2 authorization IDs.

User Response: The secondary ID list may not be available if the RECOVERY MANAGER program ARMAUTH or MRMSAUTH is not APF authorized or in an authorized load library. Check with your site's installation personnel. You can use the RECOVERY MANAGER control information to switch your DB2 primary ID to one of your secondary authorization IDs. This can be done without APF authorization.

BMC80550E CANNOT MODIFY GROUP creator.name – NOT AUTHORIZED

Explanation: RECOVERY MANAGER attempted to save the current group, but none of the user's authorization IDs matched the group's creator or any IDs granted access to the group.

User Response: The group creator or any authorized ID may grant access to other users or to PUBLIC. The user's authorization may have been revoked since the time the group was opened.

BMC80551E CANNOT MODIFY GROUP creator.name TIMESTAMP DOES NOT MATCH

- **Current User's Timestamp: timestamp**
- **Database Timestamp: timestamp**
- **Database Updated By: userid**

Explanation: RECOVERY MANAGER attempted to save the current group, but the group has been updated by another user since the current user opened it.

User Response: Open the group again to view the current status. Make modifications again if still required. The user's authorization may have been revoked since the time the group was opened.

BMC80552E DUPLICATE GROUP NAME – creator.name ALREADY EXISTS

- **Database Date Created: date/time**
- **Database Updated By: userid**

Explanation: RECOVERY MANAGER attempted to save a new group, but a group with the same name was found in the repository. The existing group was created on the date and time shown and was last updated by the user ID shown.

User Response: Change your group name and save the group again.

BMC80553I GROUP DELETED – THE GROUP WAS DELETED

Explanation: The current group was deleted from the repository. No further processing on the group will be allowed.

User Response: This message is for information only. No action is required.

BMC80554I CDR POINT ESTABLISHED AT TIME time RBA rba

Explanation: A coordinated disaster recovery point has been established at the time and RBA shown.

User Response: This message is informational. No further action is required.

BMC80555E UNABLE TO ESTABLISH num CDR POINTS

Explanation: The number of coordinated disaster points(CDRs) shown could not be resolved from log data available.

User Response: Probable internal error. Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80556I UTILITY OPTIONS SAVED. THE OPTIONS WERE SAVED SUCCESSFULLY

Explanation: The utility options have been saved in the repository successfully.

User Response: This message is informational. No further action is required.

BMC80557E DUPLICATE OPTIONS NAME creator.name ALREADY EXISTS

Explanation: Attempting to save a new options set, but an options set with the same name was found in the repository. The existing options set was created on the date and time shown and was last updated by the user ID shown.

Database Date Created: *date/time*

Database Updated By: *userid*

User Response: Change your options set name and save again.

BMC80558E CANNOT MODIFY OPTIONS *creator.name* TIMESTAMP MISMATCH

Explanation: Attempting to save the options, but the options have been updated by another user since the current user opened it.

Current User's Time Stamp: *time stamp*

Database Time Stamp: *time stamp*

Database Updated By: *userid*

User Response: Open the options again to view current status. Make modifications again if still required.

BMC80559E NOT AUTHORIZED TO UPDATE SUBSYSTEM DEFAULT RECOVERY OPTIONS

Explanation: You have attempted to save changes to the RECOVERY MANAGER subsystem default recovery options, but you are not authorized. You must have one of the following authorizations:

- installation SYSADM
- SYSADM
- DBADM authority on the RECOVERY MANAGER repository database

User Response: You may continue using the options for this session. Contact your DB2 system administrator for authorization.

BMC80560W NOT APF AUTHORIZED – SOME DB2 INFORMATION WILL BE UNAVAILABLE

Explanation: The executing program found that it is not APF authorized. Either the program is in an unauthorized library or the ARMAUTH program has not been added to the AUTHPGM NAMES section of member IKJTSOxx in SYS1.PARMLIB.

Some DB2 information will not be retrieved, such as the user's DB2 authorization, the DB2 site type, and system data set information. However, processing will continue.

User Response: Secondary IDs are accessible to the program by setting the current SQL ID to a secondary ID. Other information will take default values from the RECOVERY MANAGER control information or the user may be prompted.

BMC80561E SECURITY CHECK FAILED INCONSISTENCY FOUND

Explanation: The product CPU security check failed.

User Response: Contact your BMC Software sales representative for assistance.

BMC80563W REFERENCE DELETED FOR GROUP *creator.name*

Explanation: The utility options deleted were referenced by the group shown.

User Response: The message is for information. You may want to select another set of utility options for that group.

BMC80564E PROGRAM OR LIBRARY NOT APF AUTHORIZED, UNABLE TO CONTINUE

Explanation: The executing program found that it is not APF authorized. Either the program is in an unauthorized library or the ARMAUTH program has not been added to the AUTHPGM NAMES section of member IKJTSOxx in SYS1.PARMLIB.

The authorization is required, so the program cannot continue.

User Response: Contact your systems programmer to authorize the library or move the program to an authorized library. All libraries in the STEPLIB or JOBLIB concatenation must be authorized.

BMC80565I UTILITY OPTIONS DELETED. THE OPTIONS WERE DELETED SUCCESSFULLY

Explanation: The utility options have been deleted from the repository successfully.

User Response: This message is informational. No further action is required.

BMC80566E INVALID CREATOR NAME *creator.name* NOT SAVED

Explanation: Attempting to save a new group, but none of the user's authorization IDs matched the group's creator or PUBLIC. The group creator name must be PUBLIC or one of the user's authorization IDs, which could be either the primary or one of the associated group IDs.

User Response: The user's group ID list is retrieved using the MRM3@ATH module. The supplied version of the module should work in a SAF environment. If your environment does not support SAF, review the product documentation regarding authorization with your site security administration. Your site may require a site replacement of the module or enablement of SAF.

Use a different creator name for the group. Check into the security implementation if you were trying to use one of your IDs and the product is not recognizing it.

BMC80567E INVALID CREATOR NAME *creator.name* NOT SAVED

Explanation: Attempting to save new Utility Options, but none of the user's authorization IDs matched the group's creator or PUBLIC. The group creator name must be PUBLIC or one of the user's authorization IDs, which could be either the primary or one of the associated group IDs.

User Response: The user's group ID list is retrieved using the MRM3@ATH module. The supplied version of the module should work in a SAF environment. If your environment does not support SAF, review the product documentation regarding authorization with your site security administration. Your site may require a site replacement of the module or enablement of SAF.

Use a different creator name for the Utility Options. Check into the security implementation if you were trying to use one of your IDs and the product is not recognizing it.

BMC80569I NO plans/packages FOUND

Explanation: RECOVERY MANAGER could not find any plans and/or packages to list for the selected group or object.

User Response: Check that you selected the correct group or object. Otherwise, this message is for information only and no action is required.

BMC80570I COMMAND COMPLETE RC = rc

Explanation: The command completed with the specified return code. If the return code is zero, the command completed with no warnings or errors. If the return code is not zero, check previous messages.

User Response: Check other messages if the return code is not zero. Otherwise, this message is for information only, and no action is required.

BMC80572I VOLSER DEVTYPETRACKS USED

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80573E TORESTARTRBA SPECIFIED BUT NOT FOUND IN HISTORY FILE.

Explanation: The input specified TORESTARTRBA but no restart RBA was found in the BMC Software Archive History File.

User Response: Check for other warning messages and that ARMBSTR was run prior to the execution of ARMBGEN.

BMC80574W ONLY SET COMMAND(S) FOUND IN INPUT

Explanation: The input did not contain any command other than a SET command.

User Response: Check the control cards in ARMIN.

BMC80575E UNTERMINATED COMMAND

Explanation: A command in ARMIN has not been terminated by a semicolon. It was not processed.

User Response: Correct your syntax and submit the job again.

BMC80576E ALLOCATION FAILED FOR ddname, ECODE = ecode, ICODE = icode

Explanation: RECOVERY MANAGER attempted to dynamically allocate the named data set but the allocation failed. Additional messages are printed to the job log.

User Response: Check the additional messages. For an explanation of the ecode and icode values, refer to the *IBM MVS/ESA Programming: Authorized Assembler Services Guide*.

BMC80578E TOKEN token REPEATED OR OUT OF SEQUENCE

Explanation: While parsing the command, the token shown was encountered twice or before a required prerequisite token.

User Response: Correct your syntax and submit the job again.

BMC80580E INVALID TOKEN token1 FOR token2

Explanation: While parsing the command, the first token shown was encountered when the second token shown was expected.

User Response: Correct your syntax and submit the job again.

BMC80581E UNRECOGNIZED COMMAND cmd

Explanation: RECOVERY MANAGER attempted to parse the command, but the first token was not a recognized command.

User Response: Correct your syntax and submit the job again.

BMC80584E UNABLE TO OPEN dsname.suffix

Explanation: RECOVERY MANAGER could not open the named data set.

User Response: If the data set named in this message is an input archive log (an original DB2 archive log) the most likely cause is one of the following:

- The named data set is not cataloged. Ensure that archive log cataloging is enabled for this DB2 subsystem.
- The named data set is old and is no longer available. In this case the suffix number will be much lower than data sets currently being created. To correct the situation, use the LIMIT keyword to limit processing to logs that are available.
- The named data set is current and should be available. To correct the situation, check the job log for further information about the failure. Use RECOVERY MANAGER System Resource recovery to recover the named archive log from the corresponding second copy, and then rerun the job.

If the data set is not an input archive log, check the DD statement and the job messages. If necessary, modify the DD card and submit the job again.

BMC80585E MISSING TOKEN FOR cmd

Explanation: RECOVERY MANAGER attempted to parse the command or subcommand shown, but an expected token was not found. The command or subcommand ended before expected tokens were found.

User Response: Correct your syntax and submit the job again.

BMC80586E INVALID VALUE value FOR idtype

Explanation: While parsing the command, the value shown was specified for the identifier type shown but it is not valid.

User Response: Check the identifier rules.

BMC80587I PROCESSING VOLUME vol FOR GROUP creator.name

Explanation: A group for the volume shown is being created.

User Response: This message is for information only. No action is required.

BMC80588I GROUP NOT CREATED DUE TO NO OBJECTS FOUND

Explanation: A group was not created because no DB2 objects were found matching the definition criteria.

User Response: This message is for information only. No action is required.

BMC80589I TABLE SPACE db.ts DSNUM dsnum INCLUDED IN GROUP

Explanation: The table space was included in the group because it matched the definition criteria.

User Response: This message is for information only. No action is required.

BMC80590I INDEX authid.ixname DSNUM n INCLUDED IN GROUP

Explanation: The named index was included in the group because it matched the definition criteria.

User Response: This message is for information only. No action is required.

BMC80591I PROCESSING GROUP creator.name

Explanation: The group shown is being processed.

User Response: This message is for information only. No action is required.

BMC80592E UNRECOGNIZED TOKEN: token

Explanation: The token shown is not part of the command syntax.

User Response: Correct your syntax and submit the job again.

BMC80593E ENDRBA endrba IS NOT GREATER THAN STARTRBA startrba

Explanation: The values shown are not valid for RBARANGE. The end RBA must be greater than the start RBA.

User Response: Correct your syntax and submit the job again.

BMC80594E CATALOG FAILED FOR DSNAME dsname, RC = rc

Explanation: RECOVERY MANAGER attempted to catalog an archive log data set copy to tape but failed. The return code is from SVC 26. Additional messages are printed to the job log.

User Response: The most likely cause is one of those listed with the message BMC80576E.

If there are no messages printed to the job logs, the most likely cause is an internal RECOVERY MANAGER error. Make a note of the return code shown in the message and then contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80595E ARCHIVE LOG COPY copyn LIST MISSING OR HAS NO ENTRIES

Explanation: RECOVERY MANAGER failed to find any archive logs corresponding to the copy number shown.

User Response: Check that the SYSUT1 DD statement in the JCL shows the correct BSDS. If it is correct, contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80596E message text

Invalid Option: option

Explanation: The named option requires information that is not currently in the RECOVERY MANAGER option file.

User Response: Either update the option file through Control Information on the Main Menu or select another option.

BMC80597E message text

Explanation: An SQL error occurred while reading the RECOVERY MANAGER repository.

User Response: See previous messages for a possible cause, and then take corrective action where feasible.

BMC80599E I/O ERROR ON name

Explanation: An I/O error was encountered on the DDNAME or DSNAME shown.

User Response: If the named resource is an output resource, run the job again. If the named resource is an input resource, take appropriate steps to recover or replace it and then run the job again.

BMC80600W NO CURRENT LOG VALUES – UNABLE TO OBTAIN VALUES FROM DB2

Explanation: RECOVERY MANAGER attempted to obtain the current settings for BSDS and log data set installation options from DB2 control blocks, but was unsuccessful. Related messages will follow.

User Response: RECOVERY MANAGER will use the control information set at installation time for some system resource information. It will be unable to provide defaults for other fields not saved in its installation options. You may be asked to provide system resource information on subsequent panels.

BMC80601E BAD RC FROM YLOGC ecode – UNABLE TO OBTAIN VALUES FROM DB2

Explanation: RECOVERY MANAGER attempted to obtain the current settings for BSDS and log data set installation options from DB2 control blocks, but received a program error condition code shown in the message.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80602E NOT VALID FOR TAPE – THE FIELD IS ONLY VALID FOR DISK

Explanation: RECOVERY MANAGER detected (from current DB2 control block values or from RECOVERY MANAGER control information) that the archive log data sets are on a tape device. The indicated field only applies to disk data sets only.

User Response: Clear the indicated field.

BMC80603E NOT VALID FOR DISK – THE FIELD IS ONLY VALID FOR TAPE

Explanation: RECOVERY MANAGER detected (from current DB2 control block values or from RECOVERY MANAGER control information) that the archive log data sets are on a disk device. The indicated field only applies to tape data sets.

User Response: Clear the indicated field.

BMC80604E NOT VALID FOR TAPE – DATA SETS CANNOT BE RENAMED

Explanation: RECOVERY MANAGER detected from the control information that the archive log data set is on a tape device. Tape data sets cannot be renamed.

User Response: Select Delete to uncatalog the existing tape data sets. Change the setting for archive logs on tape in the control information if your archive is not on tape.

BMC80605E DATA SET NAME NOT UNIQUE MATCHES EXISTING DATA SET NAME

Explanation: You specified a data set name to rename a DB2 system resource that you are about to recover. However, the name specified either matches the existing name of the resource data set or it matches the new name given for another copy of the resource.

User Response: Review the names of your DB2 system resource data sets through the RECOVERY MANAGER control information settings or your DB2 ZPARMS for the subsystem.

BMC80606E INVALID BLOCK SIZE BLOCK SIZE MUST BE A MULTIPLE OF 4096

Explanation: You specified a block size that was not a multiple of 4096.

User Response: Specify a value from 4096 through 28672 that is a multiple of 4096.

BMC80607x ARCHIVE LOG COPY copynum IS NOT CATALOGED

Explanation: RECOVERY MANAGER attempted to process an archive log copy that has not been cataloged. The copy number can be any number from 1 through 4. The message can be issued either as a warning (BMC80607W) or an error (BMC80607E).

User Response: Check subsequent messages for the archive log data set name.

If the message is BMC80607E, RECOVERY MANAGER cannot proceed. You should catalog the archive log, and submit the job again.

If the message is BMC80607W, RECOVERY MANAGER can proceed without the archive log. No JCL will be generated that references the uncataloged archive log.

Check subsequent messages to find out what action was taken (or not taken) by RECOVERY MANAGER due to the uncataloged archive log.

BMC80608x ARCHIVE LOG COPY copynum NOT FOUND IN THE file

Explanation: RECOVERY MANAGER failed to locate an archive log in either the BMC Software Archive History File or in the BSDS. The copy number can be any number from 1 through 4. The message can either be issued either as a warning (BMC80608W) or an error (BMC80608E).

RECOVERY MANAGER continues processing without the missing log. No JCL is generated for this log.

User Response: Check subsequent messages for the log number, startbba and endrba of the missing log.

If the message is BMC80608E, RECOVERY MANAGER cannot continue. You should ensure that the missing archive log is recovered and that the archive log BMC Software Archive History File or BSDS is updated with the archive log name.

If the message is BMC80608W, RECOVERY MANAGER can continue without the missing archive log. No JCL will be generated that references the missing log.

- BMC80609W** **ACTIVE LOG ALLOCATION SIZES INCREASED DUE TO INITIALIZE ACTIVES OPTION**
- Explanation:* The INITIALIZE ACTIVES option causes RECOVERY MANAGER to generate JCL to initialize the active logs with the contents of the archive logs. RECOVERY MANAGER calculated that the active logs are not large enough to contain the largest archives and therefore increased the active log sizes.
- User Response:* No action is required.
- BMC80610I** **LOGNUM=lognum STARTRBA=startrba ENDRBA=endrba**
- Explanation:* This message gives the log number, start RBA, and end RBA for an archive log reported in a preceding message.
- User Response:* This message is for information only. No action is required.
- BMC80611I** **NO CHANGE LOG INVENTORY STMT GENERATED FOR DSN=dsname**
- Explanation:* Due to an error with the named data set (for example it may not be cataloged), no Change Log Inventory statements will be generated to reference the data set.
- This information refers to an archive log referenced in a preceding message.
- User Response:* See the preceding messages to determine why the data set is in error.
- BMC80612I** **ARCHIVE LOG DATA SET NAME=dsname**
- Explanation:* This information refers to an archive log referenced in a preceding message.
- User Response:* This message is for information only. No action is required.
- BMC80613E** **INVALID UNIT/VOLUME GENERATED AT STEPNUM=stepnum FOR DSN=dsname**
- Explanation:* An invalid unit/volume name has been generated in the output JCL. The invalid values are flagged in the generated output with a query string at the indicated JCL step number. This error is usually encountered when the named data set is not cataloged and RECOVERY MANAGER is unable to obtain the name of the unit/volume containing the data set.
- User Response:* RECOVERY MANAGER will continue generating the JCL if possible, but the output JCL will not run until the errors are corrected. You may manually correct the generated JCL, or catalog the data set so that RECOVERY MANAGER can find the unit/volume names, and then generate the JCL again.

BMC80614E ARCHIVE LOG HISTORY FILE ERROR. DSN=dsname

Explanation: An error occurred while attempting to read the named BMC Software Archive History File. Most of these errors occur due to incorrect editing of the BMC Software Archive History File (that is, when deleting or adding logs) after the file was last updated by RECOVERY MANAGER.

User Response: Run the RECOVERY MANAGER Archive Log Copy program ARMBARC again to correctly rebuild the file. If errors persist after the rebuild, contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80615E LASTRBA=lastrba FROM dsname NOT FOUND IN file

Explanation: RECOVERY MANAGER failed to find an archive log with the named starting RBA value.

If you specified the LASTRBA parameter on the job invocation and also specified OFFSITE YES, RECOVERY MANAGER searched the BMC Software Archive History File and failed to find an archive log with the starting RBA value specified on the parameter.

If you specified the LASTRBA parameter on the job invocation and also specified OFFSITE NO, RECOVERY MANAGER searched the BSDS and failed to find the archive log with the starting RBA value specified on the parameter.

If you did not specify the LASTRBA parameter, this message was issued because RECOVERY MANAGER failed to find the starting RBA of the last log in the BMC Software Archive History File.

User Response: If the problem is with the BMC Software Archive History File, you may need to submit the RECOVERY MANAGER Archive Log Copy program ARMBARC to create the necessary copies. If the problem is with the LASTRBA parameter, correct the value and submit the job again.

BMC80616E VCAT ALIAS NAME TRANSLATION ERROR. ALIAS=alias

Explanation: RECOVERY MANAGER was not able to successfully translate the named VCAT alias name. JCL generation does not continue.

User Response: Ensure that the VCAT specified in the control options is spelled correctly, and then submit the job again.

BMC80617I REASON=reason

Explanation: This message provides a more detailed explanation of a previously issued error or warning message. Check the preceding messages.

User Response: This message is for information only. No action is required.

BMC80618E THE OFFSITE NO ARCHIVE2 OPTION REQUIRES DUAL ARCHIVE LOGGING

Explanation: The OFFSITE NO option is not valid for a single logging DB2 system when the ARCHIVE2 keyword is specified or defaulted.

User Response: You should change the syntax to OFFSITE YES and use the RECOVERY MANAGER Archive Log Copy program, or run the job on a dual archiving system. If you want to generate JCL referencing the first archive log copy, use OFFSITE NO ARCHIVE1 syntax.

BMC80619E OFFSITE ARCHIVE LOGS THAT ARE SPANNED AND UNCATALOGED ARE NOT SUPPORTED

Explanation: The disaster recovery job cannot support off-site archive logs that are both uncataloged and spanned. RECOVERY MANAGER cannot generate the appropriate Change Log Inventory NEWLOG statements because RECOVERY MANAGER can not access the starting and ending RBAs of the archive log. Processing will not continue.

User Response: Catalog the archive logs.

BMC80620E INVALID OPTION - OFFSITE NO ARCHIVE1 NEEDS CATALOGED ARCHIVES

Explanation: The OFFSITE NO ARCHIVE1 option is not valid when the off-site archives will not be cataloged. The OFFSITE NO ARCHIVE1 option should be used in the case where the BSDS at the remote site will mirror the local BSDS—the archives need to be cataloged.

User Response: Change the syntax to OFFSITE YES, or ensure that the archives are cataloged at the remote site.

BMC80621W CONTINUING WITHOUT COPY ANALYSIS DUE TO PREVIOUS ERRORS

Explanation: Problems with copy analysis prevent stacked tape analysis and multiple job generation for catalog and directory recovery.

User Response: Review other messages prior to the next execution.

BMC80622W NO COPIES FOUND FOR DBNAME.TSNAME CONTINUING WITHOUT COPY ANALYSIS

Explanation: No image copies found for the table space shown.

User Response: Check COPYTYPE specification and ensure copies are made and ARMBARC/PACLOG have been run.

BMC80623W NOT CONNECTED TO DB2. CONTINUING WITHOUT COPY ANALYSIS

Explanation: Unable to connect to DB2 so copy information was not retrieved.

User Response: Ensure that DB2 is available for the next execution.

BMC80624I THE DATE OF THE COPY FOR DBD01 IS LOWER THAN OTHER CATALOG COPIES

Explanation: The date of a “special” space is lower than copies registered in SYSIBM.SYSCOPY.

User Response: Ensure that ARMBARC or PACLOG is run between the image copies of the catalog and directory and the execution of ARMBRSRR.

BMC80625E LOG CONTAINING LASTLRSN IS NOT A QUIESCED ARCHIVE LOG

Explanation: The user specified an LRSN parameter to ARMBRSRR. The archive log corresponding to that LRSN was not produced by a DB2 ARCHIVE LOG MODE(QUIESCE) command and therefore cannot be used for a disaster recovery point with this version of DB2.

User Response: Remove the LASTLRSN parameter and let ARMBRSRR locate the last quiesced logs, or perform a PRINT LOG MAP to find a LRSN that corresponds to a quiesced log for each of the members subsystems.

BMC80626E UNABLE TO LOCATE QUIESCED LOG

Explanation: ARMBRSRR was not able to locate a quiesced log. In a DB2 Version 4 data sharing environment, a recovery must be to the end of a set of quiesced archive logs.

User Response: Issue a DB2 ARCHIVE LOG MODE(QUIESCE) command, wait for the off-load to complete on all members, and then submit ARMBRSRR again.

BMC80627E LASTRBA IS INVALID FOR DATA SHARING. USE LASTLRSN

Explanation: The LASTRBA parameter was used with ARMBRSRR, but it is not valid for a data sharing subsystem.

User Response: Specify LASTLRSN with an LRSN, or let ARMBRSRR locate the last valid recovery point.

BMC80628E LASTLRSN IS ONLY VALID FOR DB2 V4 OR HIGHER

Explanation: The LASTLRSN parameter was used with ARMBRSRR, but the DB2 version is lower than Version 4.

User Response: Use the LASTRBA parameter, or let ARMBRSRR select the last valid recovery point.

- BMC80629E** **UNABLE TO UPDATE HISTORY FILE. RC = rc, DSN = dsn**
- Explanation:* RECOVERY MANAGER was unable to update the BMC Software Archive History File for the data set shown.
- User Response:* Contact the BMC Software product support representative for RECOVERY MANAGER with the information contained in the message.
- BMC80630W** **INDEXES MAY BE MISSING UNABLE TO OBTAIN VALUES FROM DB2 REASON = reason**
- Explanation:* User defined catalog indexes, if they exist, are not included in the list of objects to be recovered. The reason for the possible omission is listed.
- User Response:* If it is necessary to include these indexes, the user must correct the error and generate the list again.
- BMC80631E** **UNABLE TO LOCATE CRRPOINT WITHOUT DB2 CONNECTION**
- Explanation:* CRRPOINT was requested but DB2 is not available so the repository cannot be accessed.
- User Response:* Start DB2 and submit the job again.
- BMC80632E** **UNABLE TO LOCATE REQUESTED CRRPOINT VALUE FOR SSID**
- Explanation:* If a value was specified for CRRPOINT, a row was not found for the SSID shown; otherwise, a row was not found for the SSID for the most recent timestamp.
- User Response:* Check CRRPOINT value and ensure that ARMBCRC has been run for the member.
- BMC80633I** **MAXLOGJOBS CHANGED TO N DUE TO MAXIMUM OF 32 JOBS**
- Explanation:* The setting of MAXLOGJOBS resulted in more than 32 jobs due to the number of data sharing members. The number of jobs was reduced to be 32 or less.
- User Response:* No action required.
- BMC80634E** **CRRPOINT TIMESTAMP MISMATCH: TIMESTAMP1 AND TIMESTAMP2**
- Explanation:* At least one member of the group had a different timestamp or is missing an entry.
- User Response:* Check the content of the table. Take another coordinated recovery point through CRM.

BMC80635E REQUESTED CRRPOINT FOUND BUT RBA IS NULL. RUN ARMBCRC ON SSID

Explanation: A row was located for the subsystem but the RBA column was still set to NULL.

User Response: Run ARMBCRC for the subsystem and then resubmit the job.

BMC80636I number GENERATIONS OF gdgbase SEEN

Explanation: There were the displayed number of generations of the GDG base shown seen in SMF records matching the selection criteria.

User Response: No action required.

BMC80637W OPTIONS NOT FOUND NAME: *creator.name*

Explanation: Attempting to open the options, but they were not found in the repository. The options have been deleted.

User Response: Make a new options selection.

BMC80638I data set ALLOCATION PRECEDES REFERENCES - NOT ADDED

Explanation: The data set shown was found in the SMF records and matched the selection criteria. It was not added to the group, however, since an SMF allocation record was found also matching the criteria which occurred prior to any references to the data set. The interpretation of this condition is that the jobs will allocate the data set as needed.

User Response: If you wish to add this data set to the group, you may do so from the on-line product.

BMC80673E FOUND RBA rba WHILE LOOKING FOR SPECIFIED C.D.R. POINT

Explanation: The RBA shown was found before the RBA specified in the execute parameter. It is likely that an additional archive log was created after the one containing the specified Coordinated Disaster Recovery Point.

User Response: Run change log inventory to remove any log(s) after the one that contains the specified point.

BMC80684W RC = rc ATTEMPTING TO ADD IMAGE COPY DATA FOR dsname

Explanation: RECOVERY MANAGER encountered one of the following errors (denoted by the return code) while attempting to incorporate information about the named image copy into the BMC Software Archive History File:

- 101 – A log record segment was encountered that was not long enough to contain sufficient information to update the BMC Software Archive History File with the image copy data.
- 102 – A log record segment was encountered that was too long to fit in the BMC Software Archive History File (more than 10 volumes in the volser list).

User Response: This message is informational only. No action is required.

BMC80800E REQUIRED VALUE MISSING – A REQUIRED VALUE HAS NOT BEEN ENTERED

Explanation: The field at the cursor position is required.

User Response: Type the information required at the current cursor position, and then press Enter.

BMC80801E DUPLICATE ENTRY – CANNOT ADD ENTRY TO LIST

Explanation: The new entry cannot be added to the list because an entry already exists with the same key value.

User Response: This message is informational only. No action is required.

BMC80802E CANNOT ADD PART/DSNUM num PART/DSNUM num IS ALREADY IN LIST

Explanation: PART/DSNUM 0 and an individual PART/DSNUM cannot coexist in a list. The named object already exists in the current list.

User Response: This message is informational only. No action is required.

BMC80803E INVALID COMBINATION – ENTRIES ARE MUTUALLY EXCLUSIVE

Explanation: The field at the cursor position is mutually exclusive with previous entries.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80804E

message text

Invalid Data: data

Explanation: RECOVERY MANAGER encountered the invalid data shown.

User Response: Correct the information at the current cursor position, and then press Enter.

BMC80805E

VALUE OUT OF RANGE

Explanation: The invalid data reported in message BMC80804E is out of range. It must be in the range displayed by RECOVERY MANAGER.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80806E

EXTRANEIOUS IDENTIFIER – TOO MANY PARTS

Explanation: The field at the cursor position requires the partition entry displayed by RECOVERY MANAGER.

User Response: Correct the information at the current cursor position, and then press Enter.

BMC80807E

INVALID ACTION – NOT ALLOWED FOR INDEX

Explanation: This action is only valid for table spaces, not for indexes.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80808E

INVALID COMBINATION – COMMAND AND ACTION(S) NOT ALLOWED TOGETHER

Explanation: A command cannot be entered at the same time as one or more actions are being performed on the list.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80809E

INVALID RBA ORDER – END RBA MUST BE >= START RBA

Explanation: The value for the end RBA must be greater than or equal to the value of the start RBA.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80810E INVALID DATABASE – NOT A SYSTEM DATABASE

Explanation: The database name entered was not a system database: DSNDB01 or DSNDB06. The function is only supported for system databases.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80811E INVALID SPACE NAME – NOT A SYSTEM INDEX OR TABLE SPACE

Explanation: The space name entered was not a system index or table space. The function is only supported for system spaces found in databases DSNDB01 or DSNDB06.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80812E INVALID LOG RBA – LOG RBA MUST END IN X'FFF'

Explanation: The log RBA does not end in X' FFF'. DB2 requires this value to end in X'FFF'.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80813E BLOCK ACTION INCOMPLETE NO MATCH FOUND FOR SS OR XX

Explanation: A Block Action selection (SS or XX) was encountered without a match. You must enter the action on two lines to identify the block. The action must be the same on both lines.

User Response: Make sure that Block Action(s) are correctly paired and then press **Enter**.

BMC80814E INVALID RANGE – INVALID INTERVAL BETWEEN START AND END

Explanation: When specifying a time range for recovery point analysis, you entered an invalid range.

User Response: Make sure that the End Limit is later than the Start Limit and that the difference is no more than 7 days.

BMC80815E INVALID SELECTION – ICTYPE NOT ALLOWED FOR RECOVERY POINT

Explanation: The copy type selected is invalid for the specified recovery point.

User Response: Select an image copy or quiesce point.

BMC80816E INVALID LOG RBA – LOG RBA MUST END IN X'000'

Explanation: The log RBA does not end in X'000'. DB2 requires this value to end in X'000', meaning that it is an even multiple of 4096.

User Response: Use a log RBA that ends in X'000'.

BMC80817E INVALID TIMESTAMP – FORMAT MUST BE 'YYYYDDHHMMSS'

Explanation: In the message:

YYYY indicates the year (1989-2099)
DDD indicates the day of the year (0-366)
HH indicates the hour (0-23)
MM indicates the minutes (0-59)
SS indicates the seconds (0-59)
T indicates tenths of a second

If fewer than 14 digits are specified, trailing zeros are implied.

Note: You may not specify partial time stamp components, such as only the year.

User Response: Correct the format of the time stamp.

BMC80818E INVALID TIMESTAMP ORDER – END TIME MUST BE >= START TIME

Explanation: The end time of the time stamp must be greater than or equal to the value of the start time. The time stamp format is YYYYDDHHMMSS. If fewer than 14 digits are specified, trailing zeros are implied.

User Response: Correct the time stamp.

BMC80819E INVALID CHECKPOINT RBA – RBA MUST BE BETWEEN START AND END RBAS

Explanation: The value of the checkpoint RBA must be greater than or equal to the start RBA and less than or equal to the end RBA.

User Response: Correct the value of the checkpoint RBA.

BMC80820E INVALID OFFLOAD RBA – RBA MUST BE <= HIGHEST WRITTEN RBA

Explanation: The value of the offload RBA must be less than or equal to the value of the highest written RBA. The offload RBA is the RBA of the last active log record that has been offloaded or written to the archive log.

User Response: Use an offload RBA that is less than or equal to the highest written RBA.

BMC80822E TABLE OPEN FAILURE – RC rc FROM TBOPEN FOR dsn

Explanation: An unexpected error was encountered.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80823E INVALID SELECTION – DSNUM MISMATCH

Explanation: The data set number or partition of the selected image copy does not match the space being recovered.

User Response: Select an alternate image copy or change to recovery by partition.

BMC80824E INVALID SELECTION – BACKUP COPY NOT VALID WITHOUT PRIMARY

Explanation: A copy specification was made without making an appropriate specification for another copy type.

The following actions are invalid:

- specifying a backup copy without specifying a primary copy
- specifying a remote primary copy without specifying a local primary copy
- specifying no primary copy without specifying no backup copy

User Response: Specify your copies in one of the following ways:

- To make only a primary copy, set LP to 1.
- To make both primary and backup copies, set both LP and LB to 1.
- To change a primary copy specification from Yes to No, set both LP and LB to 2.

BMC80825E INSUFFICIENT ENTRY – PART(S) OF MULTI PART ENTRY ARE MISSING

Explanation: The field at the cursor position requires an entry for the partition.

User Response: Type the fully qualified name, and then press **Enter**.

BMC80826E INVALID EXPDT – FORMAT MUST BE ‘YYDDD’ OR ‘YYYY/DDD’

Explanation: The expiration date specified was invalid because the format is incorrect.

User Response: Type the date using the format YYYY/DDD or YYDDD where:

YYYY indicates the year (current–2155)

YY indicates the year (current–99)

DDD indicates the day of the year (1–366)

Then press **Enter**.

BMC80827E INVALID COMBINATION – TAPE YES/NO AND UNIT SPECIFICATION

Explanation: Tape Yes or No cannot be specified without specifying a unit name, nor can the unit be specified without selecting **Yes** or **No** for tape.

User Response: Either provide a unit name or clear the specification for tape; then press Enter.

BMC80828E INVALID ACTION – NO SYSCOPY ENTRY TO DISPLAY

Explanation: D is not a valid action without a SYSCOPY row to display.

User Response: Type L to see a list of available SYSCOPY rows or clear the action field. Then, press **Enter**.

BMC80829E OPEN FAILED – text

Explanation: A library management open failed with the error named in the message.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80830E DUPLICATE NAME – DATA SET NAME ALREADY USED

Explanation: The data set name you entered for renaming a system resource data set matches the current name of a system resource data set or an earlier data set name you entered on the same panel.

User Response: Change the name of the data set. To view system resource data set names select **Control Information** in the Main Menu.

BMC80831E UPDATE FAILED – COPY TO member ENDED WITH RC=rc

Explanation: An ISPF copy to the control file information data set member shown ended with return code shown.

User Response: Check the return code information for ISPF function LMCOPY. Make sure that you have UPDATE authority to the control file information.

BMC80832E INVALID ACTION – NO SYSCOPY LIST TO DISPLAY

Explanation: L (list) is not a valid action for this object.

User Response: Delete the action L and continue.

BMC80833E SITE TYPE MISMATCH – BACKUP TYPE DOES NOT MATCH CURRENT SITE

Explanation: Only the backup types shown in the online explanation of this message are valid.

User Response: Make an alternate selection.

BMC80834E SELECTION NOT ALLOWED FOR GROUP RECOVERY TO CURRENT

Explanation: Relationships (RI and index) have not been verified. Selection of an alternate recovery point for an object could leave objects in check pending status.

User Response: You can continue with the recovery of the working group (objects with status other than OK will not be included). Then, exclude the recovered objects from the working group. Select **Recover** and a recovery type other than To Current for the remaining objects.

BMC80835E DATA SET NAME TOO LONG FOR RECOVER PLUS PARTITIONED OUTCOPY

Explanation: Since the partition number must be appended to the data set name, the name specified cannot exceed 40 characters.

User Response: Specify a data set name in 40 characters or less.

BMC80836E GDG NOT VALID FOR RECOVER PLUS PARTITIONED OUTCOPY

Explanation: Because the partition number must be appended to the data set name, generation data groups are not allowed.

User Response: Specify a data set name without GDG.

BMC80837E DATA SET NAME TOO LONG FOR ARCHIVE LOG PREFIX

Explanation: Because the archive log number must be appended to the data set name, the name specified cannot exceed 35 characters. If **TSTAMP** is set to Y in the RECOVERY MANAGER control options, the allowable prefix length is reduced to 19 characters to allow the date and time to be appended to the log data set name.

User Response: Specify a prefix with the correct length.

BMC80838E INVALID ID – DELIMITED NAME NOT ALLOWED

Explanation: A delimited name is not valid for creator or SQLID.

User Response: Remove the delimiters from the indicated field.

BMC80839E NO SAVED REQUESTS – JCL GENERATION NOT ALLOWED

Explanation: JCL generation is not allowed until requests have been saved.

User Response: Save requests before JCL generation.

BMC80840E LM FUNCTION FAILED – RC = rc FROM library_management_function

Explanation: The return code shown was received from the library management function.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80841I UPDATE COMPLETED FOR objectname

Explanation: The recovery options update was completed for the named object.

User Response: This message is for information only. No action is required.

BMC80842I UPDATE CANCELED FOR objectname

Explanation: The options update was canceled before completion. No changes were made to the utility options.

User Response: This message is for information only. No action is required.

BMC80843I DELETE COMPLETED FOR objectname

Explanation: The deletion of the recovery options requested for the named object was completed.

User Response: This message is for information only. No action is required.

BMC80844I UPDATE SUCCESSFUL – CONTROL INFORMATION UPDATED

Explanation: RECOVERY MANAGER control information was successfully updated.

User Response: This message is for information only. No action is required.

BMC80845I DELETE CANCELED

Explanation: The deletion of the recovery options requested for the named object was canceled.

User Response: This message is for information only. No action is required.

BMC80846W NOTHING TO process – NO OBJECTS HAVE STATUS OF “OK”

Explanation: No objects with an **OK** status were found. Only objects with an **OK** status may be backed up or recovered.

User Response: Determine why none of the object have an OK status.

BMC80847E INVALID TIMESTAMP – FORMAT MUST BE ‘Dyyddd.Thhmmss’

Explanation: In the message:

- *yy* indicates the year (current to 99)
- *ddd* indicates the day of the year (1-366)
- *hh* indicates the hour (0-23)
- *mm* indicates the minutes (0-59)
- *ss* indicates the seconds (0-59)
- *t* indicates tenths of a second

User Response: Type the time stamp in the format shown using the prefixes shown in the message. Then, press **Enter**.

BMC80848E JOBCARD TOO LONG – COULD EXCEED 72 CHARACTERS

Explanation: The pattern defined for the job card could result in a length of greater than 72 characters upon evaluation of the symbolics.

User Response: Shorten the card image, remove symbolics, or split the image into multiple card images.

BMC80849E INVALID JOBNAME – JOBNAME MUST CONTAIN JOB# SYMBOLIC

Explanation: The job name does not contain any of the valid job number symbolics. To allow generation of more than one job, the job name must contain at least one digit of variable job number.

If the message is issued for an ARMBSTR disaster recovery job, verify that the data set used in the ARMJCIN DD statement has at least two digits of variable job numbers (&##).

See “Symbolic Variables in Backup Data Set Names” on page 4-36 in the product user guide for more information.

User Response: Include one of the following symbolics in the job name:

- **&#** (low order 1 digit of the job number)
- **&##** (low order 2 digits of the job number)
- **&###** (low order 3 digits of the job number)
- **&####** (low order 4 digits of the job number)

BMC80850I variable CREATED FROM variable

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80851E INVALID COMBINATION – ENTRY/CONTROL INFO MUTUALLY EXCLUSIVE

Explanation: The information in the field at the cursor position is mutually exclusive with the information specified in the RECOVERY MANAGER control information.

User Response: Correct the information at the current cursor position and then press **Enter**.

BMC80852E INVALID COMBINATION – MUTUALLY EXCLUSIVE WITH OFFSITE ARCHIVE

Explanation: The field at the cursor position is mutually exclusive with what is specified for use with offsite archives. When using archive copy 1 or 2, no more than one copy can be restored to disk.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80853E RESETMOD 'NO' IS REQUIRED

Explanation: For incremental copies (FULL NO), RESETMOD YES is not valid with CUMULATIVE NO or READTYPE FULLSCAN.

User Response: For SHRLEVEL CHANGE, RESETMOD YES is not valid prior to COPY PLUS version 5.5. Specify NO or change other values first.

BMC80854E RUNSTATS NOT ALLOWED FOR INCREMENTAL BACKUPS (FULL NO)

Explanation: RECOVERY MANAGER found a request to update DB2 statistics while processing an incremental copy request. Statistics updates require a full copy of the table space.

User Response: Change the syntax to FULL YES if statistics updates are required.

BMC80855E INVALID COMBINATION FOR RUNSTATS OPTIONS

Explanation: RECOVERY MANAGER found an invalid combination of RUNSTATS options while making a full image copy.

User Response: Statistics must be reported and/or updated. If RUNSTATS is selected, you must also select reporting, updating, or both.

BMC80856E INVALID JOBCARD JOB KEYWORD NOT FOUND AS EXPECTED

Explanation: The jobcard provided did not contain a line with the JOB keyword, or the line was not in a format that was expected.

User Response: Check the jobcard you provided. There should be a line in the format: //`<jobname>` JOB.

Note: There should not be any characters preceding the //.

BMC80858E SELECTION NOT ALLOWED WITH DESCRIPTION UPDATE

Explanation: The field at the cursor position is not required for group description update.

User Response: Ignore this field. It is not required.

BMC80859E INVALID COMBINATION – DB2 VERSION DOES NOT ALLOW MISMATCH

Explanation: The current DB2 version indicator listed under **Control information** is less than 410, which allows only a single device type for archive logs.

User Response: Use the same value for the unit for both archive logs, or modify the DB2 version field under **Control information** if it is not correct.

BMC80860E INVALID COMBINATION – DB2 VERSION DOES NOT ALLOW MISMATCH

Explanation: The current DB2 version indicator listed under **Control information** is less than 410, which allows only a single device type for archive logs. Either both archives must be on tape or both must not be on tape.

User Response: Use the same value for the indicators for both archive logs or modify the DB2 version field if it is not correct.

BMC80861E INVALID WORK FILE NAME – DSNDB07 IS REQUIRED

Explanation: The work file database must be DSNDB07 in any of these cases:

- The DB2 version is less than 4.1.
- The subsystem is not a data sharing member.
- The work file database name begins with DSNDB.

User Response: Correct the work file database name or the DB2 version, as needed.

BMC80862E INVALID GROUP MEMBER – BLANK REQUIRED FOR DB2 VERSION

Explanation: A value has been specified in the group member name. This only applies to data sharing subsystems. The DB2 version must be 410 or greater in the control information to support data sharing.

User Response: Clear the member name or change the DB2 version if it is not correct.

BMC80863E INVALID DATA – ONLY VALID FOR DB2 DATA SHARING

Explanation: A value has been specified in a field that only applies to DB2 data sharing subsystems. The RECOVERY MANAGER control information indicates that the DB2 version is less than 4.1 or that this is not a data sharing subsystem.

User Response: Clear the field or correct the control information if it is incorrect.

BMC80864E INVALID LRSN ORDER – END LRSN MUST BE >= START LRSN

Explanation: The value for the ending LRSN must be greater than or equal to the value of the starting LRSN.

User Response: Correct the information at the current cursor position, and then press **Enter**.

BMC80865E NO SAVED REQUESTS – UNABLE TO GENERATE THE JCL

Explanation: No requests have been saved, so the JCL cannot be generated.

User Response: Save at least one request before attempting to generate JCL.

BMC80866E INVALID SELECTION RECOVER BACKOUT AND TO COPY NOT ALLOWED

Explanation: The combination of recover to copy and backout is not allowed.

User Response: Select a recovery point other than an image copy.

BMC80870E INVALID TIMESTAMP FORMAT MUST BE 'YYYY-MM-DD-HH.MM.SS'

Explanation: The time stamp format must be YYYY-MM-DD-HH.MM.SS where

YYYY indicates the year (1989-2099)
MM indicates the month of the year (01-12)
DD indicates the day of the month (01-31 and valid)
HH indicates the hour (00-23)
MM indicates the minutes (00-59)
SS indicates the seconds (00-59)

Components can be separated by a hyphen, period, or colon.

User Response: Correct the format to that described above.

BMC80880I object STOPPED

Explanation: The DB2 object named was stopped successfully.

User Response: This message is for information only. No action is required.

BMC80881I object HAS NOT STOPPED

Explanation: The DB2 object named has not yet stopped. The program will retry if it has not already exceeded the retry limit.

User Response: This message is for information only. No action is required.

BMC80882I WAITING n SECONDS PRIOR TO RETRYING COMMAND

Explanation: The program will wait the number of seconds specified before retrying the DB2 command in process.

User Response: This message is for information only. No action is required.

BMC80883E UNABLE TO STOP OBJECT. RETRIES HAVE BEEN EXHAUSTED.

Explanation: The DB2 object named in the previous BMC80881I message could not be stopped.

User Response: Use the DB2 DISPLAY command to wait for the space to STOP. Restart the job.

BMC80884I NO CATALOG OR DIRECTORY UTILITIES FOUND

Explanation: The program did not find any utilities executing against either the catalog or directory, so no action was necessary.

User Response: This message is for information only. No action is required.

BMC80885I TERMINATING UTILITY ID utilid

Explanation: The program found the utility shown executing against either the catalog or directory. The utility has been terminated.

User Response: This message is for information only. No action is required.

BMC80886I WAITING FOR DB2 TO DEALLOCATE DATA SETS, SECONDS = secs

Explanation: The program is waiting for DB2 to deallocate the data sets for the objects that have been stopped.

User Response: This message is for information only. No action is required.

BMC80887W UTILITY utilid REQUIRES TERMINATION ON MEMBER member

Explanation: The indicated utility has been identified in SYSUTILX as using the catalog or directory. However, it is identified under the group member name shown. It must be terminated from that member.

User Response: This message is a warning. If the job contains a step to execute ARMBTRM on the member identified, the utility will be terminated. Otherwise, the utility will have to be terminated manually on the identified member before the catalog and directory can be recovered.

BMC80888I object LPL STATUS CLEARED

Explanation: The DB2 object named is not in LPL status.

User Response: This message is for information only. No action is required.

BMC80889I object IN LPL STATUS

Explanation: The DB2 object named is still in LPL status. The program will retry if it has not already exceeded the retry limit.

User Response: This message is for information only. No action is required.

BMC80890E LPL NOT CLEARED AND RETRY COUNT HAS BEEN EXHAUSTED

Explanation: The program is terminating although the LPL status for all the objects has not cleared. The retry count has been exhausted.

User Response: Use the DB2 DISPLAY command to watch and wait for the LPL status to clear. You may need to take action to clear the problem that produced the LPL condition.

BMC80891E INVALID COMBINATION: *option* AND *option*

Explanation: The options shown are not compatible. They cannot be used together.

User Response: Change the value for one of the options shown.

BMC80893E TIMEOUT LIMIT EXCEEDED - SECONDS = seconds

Explanation: During multiple job synchronization, the task for which a wait request was being processed did not complete within the time limit shown.

User Response: Determine the task that timed out by checking the input to the ARMBSYN program. Review other jobs in the job network to determine the original problem. Correct the problem if necessary, and restart the job network. You may also increase the wait time to the ARMBSYN program via its parameters.

BMC80894E TASK KILLED BY ANOTHER JOB

Explanation: During multiple job synchronization, the task for which a request is being processed was marked as killed by another job. This generally indicates that the dependent task did not complete due to an error. The current job could not complete successfully.

User Response: Determine the task that was killed by checking the input to the ARMBSYN program. Review other jobs in the job network to determine the original problem. Correct the problem if necessary and restart the job network.

BMC80895E REQUIRED VALUE FOR KEYWORD *keyword* NOT SPECIFIED

Explanation: The keyword shown is required, but was not specified.

User Response: Edit your control cards to add the required keyword, and then re-submit the job.

BMC80896E ERROR REPORTED BY UIM EXIT, RC = rc

Explanation: During backup by MRMDSSU, an error was returned by the MRMBUIM exit with the return code shown.

User Response: Check for other messages to indicate the cause of the error. Ensure that the STEPLIB is correct.

BMC80897W NO ENTRIES WERE FOUND IN THE REGISTRATION LIST

Explanation: During backup by MRMDSSU, the registration list was empty so no backups were registered in RASCAT.

User Response: Check DFDSS messages in SYSPRINT to determine why data sets were not backed up. If DFDSS messages, indicate that some data sets were backed up, collect the job output and contact BMC Product Support.

BMC80898E REQUIRED DD ddname NOT FOUND

Explanation: The DD name shown was not found, but is required for execution.

User Response: Check the JCL and add the required DD.

BMC80899E UNEXPECTED ISPF ERROR – PLEASE NOTE THE FOLLOWING INFORMATION

- Program: *progname*
- Received Return Code: *rc*
- From ISPF Service: *service*
- ISPF Message: *text*

Explanation: An ISPF function ended abnormally.

User Response: Contact your BMC Software product support representative for RECOVERY MANAGER.

BMC80900 message text

Explanation: An error was encountered while attempting to build the BMC message file. Return codes and additional information are listed below.

RC = 150 - DDNAME: ddname - EOF WITHOUT FINDING 'ENDMESSAGE'
RC = 151 - DDNAME: ddname - EOF WITHOUT FINDING 'BEGINMESSAGE'
RC = 152 - DDNAME: ddname - EOF WITHOUT FINDING 'ENDTOKEN'
RC = 153 - DDNAME: ddname - EOF WITHOUT FINDING 'BEGINTOKEN'
RC = 160 - DDNAME: ddname - INVALID FORMAT SPECIFIER IN LONG MSG
RC = 161 - DDNAME: ddname - INVALID FORMAT SPECIFIER IN LONG MSG
RC = 162 - DDNAME: ddname - INVALID FORMAT SPECIFIER IN SHORT
MSG
RC = 163 - DDNAME: ddname - INVALID FORMAT SPECIFIER IN SHORT
MSG
RC = 170 - DDNAME: ddname - INVALID MESSAGE NUMBER - number
RC = 180 - DDNAME: ddname - FOUND BAD TOKEN (NO DELIMITER)
RC = 190 - OPEN FAILED FOR ddname

User Response: Correct the problem with the BMC message file using the additional information from the message text if possible. Contact your BMC Software product support representative for RECOVERY MANAGER if you need assistance.

BMC81001E CONNECT FAILURE FOR XCF GROUP group MEMBER member

Explanation: A request to process a CONNECT to an XCF group has failed due to a conflicting status for the indicated XCF group/member. XCF messages may follow.

User Response: See the *IBM MVS/ESA SP V5 Sysplex Services Reference* for more information.

- BMC81002E DISCONNECT FAILURE FOR XCF GROUP group MEMBER member**
- Explanation:* A request to process a DISCONNECT from an XCF group has failed due to a conflicting status for the indicated XCF group/member. XCF messages may follow.
- User Response:* See the *IBM MVS/ESA SP V5 Sysplex Services Reference* for more information.
- BMC81003I XCF RETURN CODE = rc, REASON CODE = reason**
- Explanation:* This message is usually associated with an XCF error message. XCF messages may follow.
- User Response:* See the *IBM MVS/ESA SP V5 Sysplex Services Reference* for more information.
- BMC81004E CRM MESSAGE RECEIVED FOR INACTIVE MEMBER - TOKEN = token**
- Explanation:* A message was received that could not be associated with an active XCF group/member.
- User Response:* An internal error needs to be corrected. Contact your BMC Software product support representative for RECOVERY MANAGER for assistance in determining the problem.
- BMC81005E CRM ABORT REQUEST RECEIVED FOR INACTIVE REQUEST ID = reqid**
- Explanation:* The CRM task wants to abort the indicated request. This is usually caused by exceeding the time-out limits.
- User Response:* Check the time-out values for the request on your CRM panels.
- BMC81006E ERROR DURING READ OF dsname**
- Explanation:* A read of the data set shown failed.
- User Response:* Check the data set name for correctness.
- BMC81007E ERROR DURING WRITE TO dsname**
- Explanation:* A write to the data set shown failed.
- User Response:* Check the data set name for correctness.

BMC81008E MISSING OPTION: option NOT FOUND IN OPTIONS - UNABLE TO CONTINUE.

Explanation: The option shown above was not found in the control file.

User Response: Display the control file through **Control information** on the RECOVERY MANAGER Main Menu. Update the control information to add the value. Also, check the data set named in the ARMOPTS DD statement, because this error can also indicate using an out-of-date file from a prior version of RECOVERY MANAGER.

BMC81009E OPTION option RETURNED VALUE IS NOT VALID: value

Explanation: The option shown above was found in the control file but was assigned a value that is not valid.

User Response: Display the control file through **Control information** on the RECOVERY MANAGER Main Menu. Update the control information to add the value. Also, check the data set named in the ARMOPTS DD because this error can also indicate using an out-of-date file from a prior version of RECOVERY MANAGER.

BMC81010E DATA SET NAME dsname NOT VALID - VERIFY JCLOUT DEFINITION IN OPTIONS

Explanation: The data set name evaluated from the JCL generation output data set name is incorrect.

User Response: Verify that the definition for JCLOUT is valid. See the above message for details on the specific problem with the data set name.

BMC81011E JOBCARD dsname TOO LONG - COULD EXCEED 72 CHARACTERS

Explanation: The pattern defined for the job card could result in a length of greater than 72 characters upon evaluation of the symbolics.

User Response: Shorten the card image, remove symbolics, or split the image into multiple card images.

BMC81012E ERROR DURING OPEN OF dsname ddname

Explanation: An attempt to open the named data set failed. The value shown is the data set name and (if an output data set) the corresponding DD name.

User Response: Check the data set name for correctness.

- BMC81013I RECOVERY ASSETS TO A POINT IN TIME IS NOT SUPPORTED. RP IGNORED.**
- Explanation:* Recovering assets to a point-in-time was requested. This is not supported. Processing continues with recovery to current assumed.
- User Response:* Processing continues with recovery to current assumed. No user response is required.
- BMC81014E A POINT IN TIME IS NOT ALLOWED. REQUESTED ACTION action CANCELLED.**
- Explanation:* The requested action does not support point-in-time recovery processing.
- User Response:* Try again without specifying recovery points.
- BMC81015E CRM KEYWORD keyword IS keyword value. FUNCTION function CANCELLED.**
- Explanation:* The function requested requires information not supplied with the appropriate CRM keyword.
- User Response:* An internal error needs to be corrected. Contact your BMC Software product support representative for RECOVERY MANAGER for assistance in determining the problem.
- BMC81016E MODULE module INCORRECTLY CALLED TO PERFORM FUNCTION function.**
- Explanation:* The wrong module was called to perform the named function.
- User Response:* An internal error needs to be corrected. Contact the BMC Software product support representative for RECOVERY MANAGER for assistance in determining the problem.
- BMC81017E REQUESTED ACTION action IS NOT SUPPORTED.**
- Explanation:* Although this is a valid action type for the requested CRM function in the API, RECOVERY MANAGER for DB2 does not support this.
- User Response:* An internal error needs to be corrected. Contact the BMC Software product support representative for COORDINATED RECOVERY MANAGER for assistance in determining the problem.

BMC81018E TIMEOUT LIMIT EXCEEDED - SECONDS = seconds

Explanation: The time to complete the specified function exceeds the indicated time limit.

User Response: Increase the timeout limit that was specified from the CRM input panels to allow more time for the function to complete, or improve the performance of the system the function is running on to allow it to complete more quickly.

**BMC81019E RECOVERY POINT GENERATION HALTED: dbname.spname
[PART=part] STATUS=status**

Explanation: The object shown (database, space) is in the status shown. This status prevents generation of a recovery point. The part term is included only when the space is partitioned.

User Response: Investigate the current status to determine the cause and how to move the object into an allowable status for recovery point generation. The primary status must be one of RO, RW, or UT. If there are additional statuses, they can be only UTRO or UTRW.

**BMC81020E UNABLE TO OBTAIN A LOCK ON bmctable TABLE.
RETRIES=number:total SQLCODE=sqlcode.**

Explanation: The current process is unable to obtain a necessary lock on the BMC Software table (CRRDRPT, BMCUTIL, or BMCSYNC) shown. The number of retries, the total number of retries allowed, and the SQLCODE returned from the last attempt, are also shown.

User Response: If the failure is not related to the total retries allowed, see the preceding SQL messages that indicate the cause of the failure.

**BMC81021E UNABLE TO INSERT A ROW IN bmctable TABLE.
RETRIES=number:total. SQLCODE=sqlcode.**

Explanation: The current process is unable to insert a row into the BMC Software table (BMCUTIL or BMCSYNC) shown. The number of retries, the total number of retries allowed, and the SQLCODE returned from the last attempt are also shown.

User Response: If the failure is not related to total retries allowed, see the preceding SQL messages that indicate the cause of the failure.

BMC81022E UNABLE TO COMPLETE HANDSHAKE - REASON = reason

Explanation: Either an incorrect handshake protocol was used, or a timeout or an abort was sent by CRM.

User Response: Check the time-out parameters for the task, and submit the job again.

- BMC81023E COMMIT FAILED FOR bmctable TABLE. SQLCODE=sqlcode.**
- Explanation:* The current process is unable to commit the work done for the table (BMCUTIL, CRRDRPT, or BMCSYNC) shown. The SQLCODE returned is also shown.
- User Response:* See previous SQL messages to help determine the cause of the failure.
- BMC81024E RECOVERY MANAGER UNABLE TO SYNCHRONIZE dbname.spname.dsnum - BMC UTILITY utility.**
- Explanation:* The current process attempted to synchronize on the database, space, and dsnum shown. However, the BMC Software utility shown has exclusive control in the BMCSYNC table.
- User Response:* Allow the specified BMC Software utility to complete its operations before attempting to obtain a recovery point again. If the utility is not involved in an operation, contact the BMC Software product support representative for that BMC Software utility to determine the cause of the failure and how to clean up the BMCSYNC and BMCUTIL tables.
- BMC81025E UNABLE TO DELETE ROW(S) IN bmctable TABLE. SQLCODE=sqlcode. [RETRIES=number:total]**
- Explanation:* The current process is unable to delete one or more rows from the table (BMCUTIL or BMCSYNC) shown. The SQLCODE returned from the last attempt is shown. If the SQLCODE is -904 or -911, the number of retries is also shown.
- User Response:* If the failure is not related to the maximum retries allowed, see any preceding SQL messages indicating the cause of the failure.
- BMC81026I BMCSYNC CLEANUP. DID NOT FIND UTILITY ID utilid IN TABLE table.**
- Explanation:* The termination process for BMC Software utility synchronization found an error. No rows in the table shown were found with the utility ID specified.
- User Response:* Processing continued; however, you may want to contact the BMC Software product support representative for RECOVERY MANAGER to try to determine why this information was lost from the BMC synchronization tables.
- BMC81027E MEMBER DISCONNECTED BEFORE COMPLETING TASK**
- Explanation:* XCF has indicated that the member involved in the task is no longer connected to the group.
- User Response:* The started task and a batch job were interrupted, during an XCF communication, by one of them abruptly ending. The survivor will acknowledge this situation with this message.

BMC81028E REQUESTED ACTION TYPE type WITH FUNCTION function IS NOT RECOGNIZED.

Explanation: The action type specified with the function shown was not recognized.

User Response: Contact the BMC Software product support representative for COORDINATED RECOVERY MANAGER for MVS to determine why an unrecognized action was requested.

BMC81029E UNABLE TO STOP SPACE dbname.spname - RETRY COUNT HAS BEEN EXHAUSTED

Explanation: The program has terminated although all DB2 objects have not yet successfully stopped. The retry count has been exhausted.

User Response: Use the DB2 DISPLAY command to monitor the termination and wait for the objects to stop before proceeding.

BMC81030E INSERT ROW: TABLE table FAILED. SQLCODE=sqlcode

Explanation: The table specified had an insert failure.

User Response: See the SQLCODE and any previous SQL error messages to determine the reason for the failure. The cause of the failure must be corrected before this program can continue.

BMC81031E BMC UTILITY ID utilid FOUND IN TABLE BMCUTIL - MUST BE UNIQUE.

Explanation: During processing to synchronize BMC Software utility activity, the utility ID defined for the current operation was found to be already in use in the BMCUTIL table.

User Response: It is possible that a previous operation failed and the BMCSYNC and BMCUTIL tables were not cleaned up completely. The synchronization table BMCUTIL can be cleaned up manually by using SPUFI and deleting the row with UTILID=jobname.*, where jobname is the name of the RECOVERY MANAGER DB2 Server started task.

BMC81032E NO MATCHES FOUND FOR GROUP PATTERN=pattern.

Explanation: The group pattern passed in does not return any matches from the RECOVERY MANAGER repository.

User Response: Modify the specified group pattern in order to match existing groups in RECOVERY MANAGER.

BMC81033E XCF GROUP OR MEMBER NAME TOO LONG

Explanation: The XCF group and/or member name is too long.

User Response: Change one or both names to be not greater than the maximum allowed length. An XCF group name may not exceed 8 characters. An XCF member name may not exceed 16 characters; this includes the member name you supply (up to 13 characters) and the prefix supplied by RECOVERY MANAGER.

BMC81034E SSID MUST BE FROM 1 to 4 CHARACTERS

Explanation: The value of the ssid term of the CONNECT command is too long or missing. The value must be from one to four characters.

User Response: Change the ssid term to the required length.

BMC81035I JOB jobid SUBMITTED

Explanation: A job with the named ID was submitted.

User Response: This message is for information only. See the job output for information on the results of the job.

BMC81036E BMCSYNC CLEANUP ERROR. CANCEL CRRINP NULL: CANNOT OBTAIN UTILID.

Explanation: The termination process for BMC Software utility synchronization found an error. Requesting the Cancel ArmCrrInp object returned a null pointer. The process was unable to obtain the utility ID to complete the BMCSYNC cleanup process.

User Response: Contact the BMC Software product support representative for RECOVERY MANAGER to determine the cause of the failure.

BMC81037E BMCTrack STMT MISSING OR CORRUPTED: JOBNAME jobname IN DS dsname.

Explanation: While reading the JCL from the named data set, it was determined that the BMCTrack JCL statement defined during the build phase is either nonexistent or does not match with the current values, thus indicating that the data set may be corrupted.

User Response: If there are multiple jobs within this data set, use the specified job name to determine which job is being processed. One possibility is that the JCLOUT values specified in the options file are not granular enough to avoid collisions, and function requests are corrupting previously created JCL files.

BMC81038E USER NOT AUTHORIZED FOR function ON ALL DATABASE NAMES IN GROUP(S).

Explanation: The user is not authorized to perform the function specified. Both the primary ID and the secondary list were checked for this operation.

User Response: See the output log where detailed traces for each database name are located. Modify the authorization either for the primary ID or one of the IDs in the secondary list to authorize the user to request the specified function.

BMC81039E ABEND DETECTED IN JOB jobid

Explanation: A job with the job ID indicated was submitted, and an abend has been detected.

User Response: Investigate the abend detected to determine the cause of the job failure.

BMC81040E CURRENT FUNCTION = function. DS data set INDICATES function

Explanation: While reading the JCL from the above data set, it was determined that the BMCTrack JCL statement defined during the build phase indicates a function for the JCL that does not match with the current execute request. The data set may be corrupted.

User Response: One possible cause is that the JCLOUT values specified in the options file are not granular enough to avoid collisions, and function requests are corrupting previously created JCL files.

BMC81041E dsname - DS dsnum SPECIFIED IS text

Explanation: The data set (and member, if specified) either has an organization mismatch with the actual data set or the data set does not exist.

User Response: Correct the specified data set name or data set and run the job again.

BMC81042E OBJECT tsname.dbname: status

Explanation: The named space is in the invalid state shown, and therefore the requested operation cannot be completed.

User Response: Correct the invalid state of the space, or remove it from the current group, and continue.

BMC81043E NO JOB SUBMITTED FROM DS=dsname

Explanation: In reading the named data set, no job was found to submit for execution.

User Response: Check the data set and review the information from the build job.

BMC81044I NO RECOVERY POINTS FOUND FOR CRITERIA ENTERED.

Explanation: A CRM user requested a list of recovery points; however, none were found using the specified date/time criteria.

User Response: Widen the search criteria to increase the possibility of a hit.

BMC81045E ERROR PROCESSING JES PRINT QUEUE, RC = rc REASON = reason

Explanation: A request has been received via CRM to display print from the JES print queue. The value of RC is used to determine the reason for any error: The follow return codes may be used:

- 4 No more data sets to select
- 8 Job not found
- 12 Invalid search arguments
- 16 Unable to process now
- 20 Duplicate jobnames
- 24 Invalid jobname/jobid combination
- 28 Invalid destination specified
- 32 Authorization failed

User Response: Determine the error from the return code and take appropriate action.

BMC81046I message text

Explanation: General print line for JES output.

User Response: No action required.

BMC81047I WTO: TIME timestamp FOR MEMBER ssid INSERT SUCCESSFUL TO BMCARM_CRRDRPT.

Explanation: WTO message sent to indicate that the insert of the time and member information was successful to the DB2 table BMCARM_CRRDRPT.

User Response: You can use a job scheduler to monitor this message and issue ARCHIVE LOG command.

BMC81048E TIME TIMESTAMP FOR MEMBER SSID INSERT TO BMCARM_CRRDRPT FAILED. RC=RC

Explanation: During the Coordinated Disaster Recovery process, phase 2, the attempt to store the time and member name into the BMCARM_CRRDRPT DB2 table failed with the return code shown above.

User Response: See the previous error messages for the specific DB2 errors reporting the problem.

BMC81049E MESSAGE RETRIEVAL FAILED FROM MESSAGE TABLE.

Explanation: During the Coordinated Disaster Recovery process, phase 2, an attempt to create the WTO message for sending failed because the message string could not be retrieved from the message table.

User Response: Check the data set named in the ARMMMSG DD to ensure it is version 3.1.

BMC81050E FILE I/O ERROR error ACCESSING SYNC FILE syncfile

Explanation: A file access error was detected while reading or writing the job synchronization file.

User Response: Check job messages for I/O errors.

BMC81051E START NOT FOUND FOR EVENT event. CANNOT PROCESS STOP.

Explanation: While processing a STOP command for the named event, a START command for the event was not found in the synchronization file.

User Response: View the synchronization file, and determine if a prior job step containing the START command executed successfully.

BMC81052E START FOR EVENT event ALREADY EXISTS. CANNOT PROCESS START.

Explanation: A START command for the event already exists in the synchronization file, so another START command for the event is not allowed.

User Response: View the synchronization file, and determine if a prior job step contains the same START command in this job or in a related job.

BMC81053W REPOSITORY HAS vrrmm LEVEL OF OPTIONS. UPDATES NOT ALLOWED.

Explanation: The repository contains utility options for the group or subsystem at a higher level than the current code. The level is shown in the message. To avoid losing information from the higher level, updates to the repository from the current level of RECOVERY MANAGER will not be allowed.

User Response: You may continue with work, but may not save any changes to utility options. Use the version of RECOVERY MANAGER shown to update the group or subsystem utility options.

BMC81054E REPOSITORY HAS vrrmm LEVEL OF OPTIONS. UPDATES NOT ALLOWED.

Explanation: The repository contains utility options for the group or subsystem at a higher level than the current code. The level is shown in the message. Updates to the repository from the current level of RECOVERY MANAGER will not be allowed to avoid losing information from the higher level.

User Response: You may continue with work but may not save any changes to utility options. Use the version of RECOVERY MANAGER shown to update the group or subsystem utility options.

BMC8055E UNABLE TO UPDATE A ROW IN tablename TABLE. RETRIES=number of retries. SQLCODE=code.

Explanation: The current process is unable to update a row in the BMC table shown above. Number of retries:Total allowed is shown, as well as the SQLCODE returned from the last attempt.

User Response: If the failure is not related to maximum retries allowed, see previous SQL messages indicating cause of the failure.

BMC81056E UPDATE ROW: TABLE tablename FAILED. SQLCODE=code.

Explanation: The table above had an update fail. See the SQLCODE and any previous SQL error messages to determine the reason for the failure.

User Response: The cause of the failure must be corrected before this program will be able to continue.

BMC81057E SELECT ON TABLE tablename FOR field1=value AND field2=value FAILED. DUPLICATE ROWS.

Explanation: The table above failed during a select for the two fields shown with a -811 return code. This failure indicates that although a SELECT was used, multiple rows were found that satisfied the conditions on the select.

User Response: These two fields should have resulted in a unique row. Investigate the contents of the table to determine the reason for the duplicate rows.

BMC81058E JES FILE ERROR error

Explanation: The named error was detected in the JES file.

User Response: Correct the file and resubmit the job.

BMC81059E CANNOT ALLOCATE DCB - DDNAME (ddname) FOR DSN dsname

Explanation: A ddname could not be allocated for the named data set.

User Response: Check the dd statement for accuracy. Correct any errors and resubmit the job.

BMC81060E RMGR product FAILED INITIALIZATION: area

Explanation: During the initialization of the RECOVERY MANAGER product specified, an error occurred in the area indicated.

User Response: The problem must be corrected before coordinated management can occur with the specified product.

BMC81061E LOAD OF MODULE module FAILED FOR CONNECT: XCF GROUP 'group' MEMBER 'member'

Explanation: A request to process a CONNECT to an XCF group has failed, because unable to load module indicated.

User Response: It is most likely that the data set which contains the load module is not accessible from the RECOVERY MANAGER server.

BMC81062E MODULE module IS AT CODE LEVEL level AND WAS CALLED WITH LEVEL level.

Explanation: The RECOVERY MANAGER server initialization code module shown above is at the code level shown. This is incompatible with the RECOVERY MANAGER server.

User Response: Modify your JCL to invoke the most recent version of the RECOVERY MANAGER server.

Note: This is the generic server formerly known as the DB2 server.

BMC81063W CONNECT SPECIFIED MORE THAN allowed number CICS KEYWORDS - REST IGNORED

Explanation: The RECOVERY MANAGER for OS/390 server, in processing a CONNECT command, discovered that more CICS keywords were specified on the CONNECT command than allowed under this implementation. Processing will continue, using the first CICS keywords found, to the current maximum. All others specified will be ignored.

User Response: Correct your CONNECT statement to avoid this warning.

- BMC81064I** **WTO: TIME time FOR SYSTEM system INSERT SUCCESSFUL TO REPOSITORY**
- Explanation:* WTO message sent to indicate that the insert of the time and system information was successful to the RECOVERY MANAGER for OS/390 repository.
- User Response:* No action required.
- BMC81065E** **INVALID TOKEN token**
- Explanation:* Invalid token passed on the command. Error is as described in the substitution variables.
- User Response:* Correct the invalid information indicated by the replacement text in the message and try again.
- BMC81066E** **CICS *text*-RC=*text* RESP=*text* RESP2=*text***
- Explanation:* The MRM Recovery Manager, in processing a recovery point request, called the CICS application shown above for the function also shown. CICS returned the following information, and information pertaining to those responses have been included when it can be determined.
- User Response:* Further information about the meaning of this information can be found in the CICS Application Programming Reference manual, under Exec Interface Blocks section, EIB fields.
- BMC81067E** **CICS INTERFACE MODULE *module* NOT INSTALLED**
- Explanation:* The MRM Recovery Manager, in processing a recovery point request, tried to invoke the module shown, but it was not found. The steplib for the Recover Manager server must contain an entry for the dataset containing this module.
- User Response:* Contact the BMC Software product support representative for RECOVERY MANAGER.
- BMC81068E** **CICS REQUEST *request* FAILED DUE TO INTERNAL ERROR *error***
- Explanation:* The MRM Recovery Manager, in processing a recovery point request, tried to satisfy the request shown. However, some internal information was missing that is required for the successful completion of this request.
- User Response:* Contact the BMC Software product support representative for RECOVERY MANAGER.

BMC81069E CICS RETURNED: *text*

Explanation: Issued following BMC81066E. This is the message pointed to from the information returned from CICS.

User Response: Contact the BMC Software product support representative for RECOVERY MANAGER.

BMC81070E MODULE MRMXSUB VERSION version MUST MATCH MODULE MRMXINI VERSION version

Explanation: The initialization routine MRMXINI, called by the RECOVERY MANAGER server, does not match the code version of MRMXSUB. Processing stopped for coordinated requests.

User Response: The load module MRMXINI is not the one available with the release of RECOVERY MANAGER that you are running, unless these match, coordinated requests to RECOVERY MANAGER cannot be processed.

BMC81199E INTERNAL PROGRAM ERROR IN module.line

Explanation: An unexpected internal error occurred in the named module at the line identified in the message.

User Response: Contact the BMC Software product support representative for RECOVERY MANAGER.

Glossary

The terms defined in this glossary include acronyms used in this manual. The definitions provided are based on those found in current MVS publications and in the *IBM Dictionary of Computing*.

A

ABACKUP A DFSMSHsm command to back up an ABARS aggregate group.

ARECOVER A DFSMSHsm command to recover an ABARS aggregate group.

ABARS IBM's Aggregate Backup and Recovery System.

ABARS aggregate group

An SMS class that defines control information and identifies the data sets to be backed up by a specific aggregate backup.

accompany data sets

In ABARS processing, a data set that is physically transported from the backup site to the recovery site instead of being copied to the aggregate data tape. It is cataloged during recovery.

ACS Automatic class selection.

AIX Alternate index.

allocate data sets

In ABARS processing, a data set name that is listed in the selection data set. The space for the data set is allocated and the data set is cataloged at the recovery site, but the actual data is not restored.

APF Authorized program facility.

AR/CTL BMC Software's APPLICATION RESTART CONTROL product.

asynchronous A mode of processing in which multiple tasks are executed simultaneously and in which the processing does not depend on the occurrence of specific events.

B

backup copy A copy of information or data that is kept in case the original is changed or destroyed.

C

checkpoint A point at which information about the status of a job and the system can be recorded so that the job step can later be restarted.

CICS Customer Information Control System.

consistent backup Backup generated to a consistent timestamp across RECOVERY MANAGERS.

coordinated recovery A method of recovery in which backups, recoveries, and associated tasks are coordinated across multiple DBMSs and applications.

CRM group In CRM™, a group that contains one or more groups that have been defined to any RECOVERY MANAGER product, such as RECOVERY MANAGER for OS/390.

cross-system coupling facility (XCF) A facility that provides a communications link between CRM and the RECOVERY MANAGER product as well as between various pieces of code within RECOVERY MANAGER.

D

DASD Direct access storage device; used in reference to fixed disk drives.

data control block (DCB) A control block used by access method routines in storing and retrieving data.

data definition name (ddname)

The name of a data definition (DD) statement that corresponds to a data control block that contains the same name.

DD statement Data definition statement.

deferred restart A system restart performed when an operator resubmits a start-up job. Contrast with automatic restart.

DFDSS Data Facility Data Set Services.

DFSMS Data Facility Storage Management System.

discrete profile A description of a single RACF-defined resource that belongs to either the DATASET class or to a general resource class.

E

EXCP Execute channel program.

F

Fast Dump Restore FDR

Innovation Data Processing's utility designed to dump and restore DASD volumes. RECOVERY MANAGER supports the Data Set Functions (DSF) component, which dumps and restores data sets.

forward recovery The process of reconstructing a data set from a particular point by restoring a saved version of the data set, then applying changes to it in the same order in which they were originally made.

G

generation data group (GDG)

A collection of data sets kept in chronological order. Each data set is a generation data set.

GMT Greenwich Mean Time.

group, application

A group consisting of all the objects (usually data sets) required by a specific application which is maintained in RECOVERY MANAGER in order to automate application backup and recovery.

H

hsm Hierarchical Storage Manager; part of IBM's DFSMS product. RMGR supports hsm backups and restores.

I

ICF Integrated catalog facility.

ICFRU See Integrated Catalog Forward Recovery Utility.

IDCAMS IBM MVS Access Method Services program for data set and catalog structure maintenance.

Integrated Catalog Forward Recovery Utility (ICFRU)

IBM utility that helps MVS users recover a damaged catalog to a correct and current status.

ISPF Interactive System Productivity Facility.

J

JCL

Job Control Language. A control language used to identify a job to an operating system and to describe the requirements of the job.

L

local site A physical MVS system installation where MVS applications are installed and in use. Contrast with recovery site.

M

MVS/XA Multiple Virtual Storage/Extended Architecture.

MVS/ESA Multiple Virtual Storage/Enterprise Systems Architecture.

O

object The smallest unit that RECOVERY MANAGER recognizes and performs functions against, usually a data set.

OpenEdition MVS System that extends support to the set of standards being developed as the Portable Operating System Interface (POSIX). Includes a hierarchical file system, exchangeability between MVS and POSIX-organized data, a UNIX-like user interface, application threads, and new commands and capabilities for interacting with TSO/E POSIX.

OS/390 IBM's generation of operating system that follows MVS/ESA.

P

pattern matching See wildcard.

phase In COORDINATED RECOVERY MANAGER, a distinct part of the total process required to perform a recovery.

partial recovery Refers to a group recovery to a prior point-in-time. The recovery can be to a specified backup or a specified timestamp.

point-in-time recovery Refers to a group recovery to the current time or a prior time.

point of consistency A point in time to which a recovery can be made without jeopardizing the integrity of the data being recovered.

POSIX Portable Operating System Interface for Computer Environments, an interface standard governed by the IEEE and based on UNIX. POSIX is not a product. Rather, it is an evolving family of standards describing a wide spectrum of operating system components ranging from C language and shell interfaces to system administration.

primary backup A backup of one or more data sets or groups. This is the first backup to be used (when specified) in an attempted recovery of those data sets. A primary backup may be designated for a local site or for a recovery site.

PROC In JCL, a command procedure.

Q

quiesce To end a process by allowing operations to complete normally

R

RACF MVS Resource Access Control Facility.

RASCAT Recovery Assets Catalog

reallocation	The process of respecifying the size of the space allocated to a data set.
recovery	The process of restoring data sets after a system failure.
recovery site	A physical MVS system installation designated as the backup system for a local site in the event a disaster recovery is necessary.
repository	In RECOVERY MANAGER, the collection of data sets in which group information is saved.
RPL	Request parameter list
RUV	BMC Software's RECOVERY UTILITY for VSAM product.

S

SAF	Source address field.
SDSF	Spool Display and Search Facility.
shared access	The availability of a resource to more than one application at a time.
SMF	System Management Facilities.
SMS	Storage Management Subsystem.
SRC	System reference code
stacked tape	A tape on which successive data sets are stored.
symbolic variables	In RECOVERY MANAGER, a symbol representing a variable node in a data set name. The symbol is a string of one or more characters prefaced by an ampersand (&).
synchronous	A mode of processing in which multiple tasks are executed sequentially and in which the processing depends on the occurrence of specific events.
sync point	A point in time when data is considered consistent and from which an application can restart if a failure occurs.
system resources	The RECOVERY MANAGER repository and RASCAT.

V

validation	In RECOVERY MANAGER, the process of verifying that all objects in a group are recoverable.
volser	The MVS name of a volume.
VSAM	Virtual storage access method.
VVDS	VSAM volume data set.

W

wildcard	A pattern-matching character. A special character that can be used to represent one or more characters in a string.
work file	A temporary file used for the temporary storage of data that is being processed.
working group	In RECOVERY MANAGER, the current group; the object group currently being processed.

X

XBM™ with SCV™	BMC Software's EXTENDED BUFFER MANAGER for CICS with SNAPSHOT COPY for VSAM.
XCF	Cross-system coupling facility.

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