



Control-M/Restart 9.0.00 User Guide



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Contents

About This Guide	11
Conventions used in this guide	12
Information new to this version	15
Related publications	15
Chapter 1 Introduction to Control-M/Restart	17
Overview	18
The difference between rerun and restart	18
Main Control-M/Restart capabilities	18
Main components	20
Control-M job scheduling definition	20
The Control-M monitor	21
The CONTROLR step	21
Control-M/Restart parameter members	21
Control-M Active Environment screen	22
Control-M/Restart online utilities	23
Reporting facility	23
Control-M/Restart under Control-M	24
Defining restart parameters in the job scheduling definition	24
Basic Control-M/Restart process overview	25
Control-M/Restart components and concepts	26
Standalone Control-M/Restart	32
Data set cleanup prior to the original run	32
Maintaining previous runs in the History Jobs file	33
Chapter 2 Online Facilities	35
Control-M/Restart under Control-M	36
Job scheduling definition parameters	36
Control-M/Restart windows and screens available from the Control-M Active Environment screen	37
Operating Control-M/Restart in standalone mode	39
Parameters of the Control-M/Restart Standalone panel	40
Control-M/Restart online utilities	43
R1: Control-M/Restart Simulation facility	43
R2: Control-M/Restart data set cleanup	48
R3: Control-M/Restart Job Data Set List utility	52
KeyStroke Language utility	55

Chapter 3	The CONTROLR Step and Control Parameters	57
<hr/>		
Overview		58
CONTROLR step		59
Parameters passed to the CONTROLR step		61
Control parameters in the Control-M/Restart PARM library		66
[NO]CHKSEC parameters		66
EXCLUDE DSN parameter		67
MSGLVL_STD/MSGLVL_FULL parameters		68
NONRESTARTABLE_STEP parameter		69
[NO]RECAPTCC/[NO]RECAPTABEND parameters		69
[NO]STEPADJUST parameters		70
TRCREST and TRCNCT2 parameters		70
UNITNAME parameter		71
Format of the \$EXCLUDE member		72
Format of the \$KEEP member		73
Chapter 4	Operation Considerations	75
<hr/>		
Restart after a system crash		76
Multi-CPU environments		76
IF/THEN/ELSE JCL blocks		77
Generation data sets (GDG)		77
\$DEFAULT parameter member		78
UNITNAME definition		78
File exclusion		79
“Helping” Control-M/Restart		79
Indicating non-restartable steps: CTRNORST DD		80
Space for archived sysouts		80
Deleting archived SYSDATA		81
Control-M/Restart and tape management systems		81
Control-M/Restart and SMS		82
Control-M/Restart interface to Control-M/Analyzer		82
Control-M/Restart interface to third party vendor products		82
Sample Control-M/Restart job restart execution		83
CONTROLR step messages		90
Index		93
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Figures

Control-M/Restart Standalone Panel	40
Control-M/Restart Simulation Panel	45
Control-M/Restart Dataset Cleanup Panel	49
Control-M/Restart Job Dataset List Panel	53
CONTROLR Step JCL	59
\$EXCLUDE Member DD Statement Example	72
Parameters entered in the job scheduling definition - sample Control-M/Restart job restart execution	83
Sample Control-M/Restart job restart execution	83
CONTROLR step messages - Example 1	90
CONTROLR step messages - Example 2	90
CONTROLR step messages - Example 3	90
CONTROLR step messages - Example 4	91

Tables

Control-M/Restart Functions and Control-M Job Scheduling Definitions Used to Define Them	20
Screens and windows available from the Active Environment screen	22
Control-M/Restart Online Utilities	23
Control-M/Restart KSL Reports	23
Job Scheduling Definition Parameters	36
Control-M Job Scheduling Parameters Available Without Control-M/Restart	37
Screens and Windows Available from the Active Environment Screen	37
General Parameters of the Control-M/Restart Standalone Panel	41
Restart parameters of the Control-M/Restart Standalone panel	41
AutoEdit Parameters of the Control-M/Restart Standalone Panel	42
Action Required Parameters	46
JCL Library Mode Parameters	46
Schedule Library Mode Parameters	47
Restart Parameters	47
AutoEdit Parameters	47
Control-M/Restart Data Set Cleanup Facility Modes	50
JCL Library Mode Parameters	50
Schedule Library Mode Parameters	50
Cleanup Parameters	50
AutoEdit Parameters	51
General Parameters	54
JCL Library Mode Parameters	54
Scheduling Library Mode Parameters	54
AutoEdit Parameters	54
Control-M/Restart PARM Library Members	58
Files Referenced by CONTROLR Step DD Statements	60
Parameters Specified in the CONTROLR Step PARM Field	62
MSGLVL_STD/MSGLVL_FULL Parameters	68
Effect of the MSGLVL parameter on message level parameters	68
TRCEST and TRCNCT Parameters	71
DD Statements in \$EXCLUDE Member	72
DD Statements in \$KEEP member	73
SEARCH Parameter Values	76
Parameters passed to CONTROLR step in sample restart	89
Control-M/Restart Messages	91

About This Guide

Control-M/Restart is a component member of the INCONTROL™ by BMC Software family of products. This guide is the basic publication on how to use Control-M/Restart software. It is intended for any person who wants to use Control-M/Restart to perform job restart or data set cleanup, or to archive jobs in the History Jobs file.

This guide contains detailed information on all Control-M/Restart functions and facilities. It contains the following chapters:

Chapter 1—Introduction to Control-M/Restart

Overview of Control-M/Restart including an introduction to Control-M/Restart logic and a description of key Control-M/Restart components.

Chapter 2—Control-M/Restart online facilities

Description of the online user interface to Control-M/Restart.

Chapter 3—CONTROLR step and control parameters

Detailed description of the CONTROLR step (a special step inserted into the JCL of the job) and control parameters that determine what processing Control-M/Restart will perform.

Chapter 4—Operations considerations

Discussion of considerations for using Control-M/Restart in a production environment.

Conventions used in this guide

Notational conventions that may be used in this guide are explained below.

Standard keyboard keys

Keys that appear on the standard keyboard are identified in boldface, for example, **Enter**, **Shift**, **Ctrl+S** (a key combination), or **Ctrl S** (a key sequence).

— **WARNING** —

The commands, instructions, procedures, and syntax illustrated in this guide presume that the keyboards at your site are mapped in accordance with the EBCDIC character set. Certain special characters are referred to in this documentation, and you must ensure that your keyboard enables you to generate accurate EBCDIC hex codes. This is particularly true on keyboards that have been adapted to show local or national symbols. You should verify that

- \$ is mapped to x'5B'
- # is mapped to x'7B'
- @ is mapped to x'7C'

If you have any questions about whether your keyboard is properly mapped, contact your system administrator.

Preconfigured PFKeys

Many commands are preconfigured to specific keys or key combinations. This is particularly true with regard to numbered PF keys, or pairs of numbered PFKeys. For example, the END command is preconfigured to, and indicated as, **PF03/PF15**. To execute the END command, press either the **PF03** key or the **PF15** key.

Instructions to enter commands may include

- only the name of the command, such as, enter the END command
- only the PF keys, such as, press **PF03/PF15**
- or both, such as, press **PF03/PF15**, or enter the END command

Command lines and option fields

Most screens contain a command line, which is primarily used to identify a single field where commands, or options, or both, are to be entered. These fields are usually designated **COMMAND**, but they are occasionally identified as **COMMAND/OPT** or **COMMAND/OPTION**.

Option field headings appear in many screens. These headings sometimes appear in the screen examples as **OPTION**, or **OPT**, or **O**.

Names of commands, fields, files, functions, jobs, libraries, members, missions, options, parameters, reports, subparameters, and users

The names of commands, fields, functions, jobs, libraries, members, missions, options, parameters, reports, subparameters, users, and most files, are shown in standard UPPERCASE font.

User entries

In situations where you are instructed to enter characters using the keyboard, the specific characters to be entered are shown in this **UPPERCASE BOLD** text, for example, type **EXITNAME**.

Syntax statements

In syntax, the following additional conventions apply:

- A vertical bar (|) separating items indicates that you must choose one item. In the following example, you would choose *a*, *b*, or *c*:

a | b | c

- An ellipsis (. . .) indicates that you can repeat the preceding item or items as many times as necessary.
- Square brackets ([]) around an item indicate that the item is optional. If square brackets ([]) are around a group of items, this indicates that the item is optional, and you may choose to implement any single item in the group. Square brackets can open ([) and close (]) on the same line of text, or may begin on one line of text and end, with the choices being stacked, one or more lines later.
- Braces ({ }) around a group of items indicates that the item is mandatory, and you must choose to implement a single item in the group. Braces can open ({) and close (}) on the same line of text, or may begin on one line of text and end, with the choices being stacked, one or more lines later.

Screen characters

All syntax, operating system terms, and literal examples are presented in this typeface. This includes JCL calls, code examples, control statements, and system messages. Examples of this are

- calls, such as

```
CALL 'CBLTDLI'
```

- code examples, such as

```
FOR TABLE owner.name USE option, . . . ;
```

- control statements, such as

```
//PRDSYSIN DD * USERLOAD PRD(2) PRINT
```

- system messages, both stand-alone, such as You are not logged on to database *database_name*, and those embedded in text, such as the message You are not logged on to database *database_name*, are displayed on the screen.

Variables

Variables are identified with *italic* text. Examples of this are:

- In syntax or message text, such as
Specify database *database_name*
- In regular text, such as
replace database *database_name1* with database *database_name2* for the current session
- In a version number, such as
EXTENDED BUFFER MANAGER for IMS 4.1.xx

Special elements

This book includes special elements called *notes* and *warnings*:

— **NOTE** —

Notes provide additional information about the current subject.

— **WARNING** —

Warnings alert you to situations that can cause problems, such as loss of data, if you do not follow instructions carefully.

Information new to this version

Additional information that is new to this version is described in Appendix A of the *INCONTROL for z/OS Upgrade Guide* and What's New section of the *INCONTROL for z/OS Release Notes*.

Related publications

Control-M for z/OS User Guide

Guide to Control-M features, options and usage.

INCONTROL for z/OS Administrator Guide

Information for system administrators about customizing and maintaining INCONTROL products.

INCONTROL for z/OS Installation Guide

Step-by-step guide to installing INCONTROL products using the INCONTROL™ Installation and Customization Engine (ICE) application.

INCONTROL for z/OS Messages Manual

Comprehensive listing and explanation of all IOA and INCONTROL messages and codes.

INCONTROL for z/OS Security Guide

Step-by-step guide to implementing security in INCONTROL products using the ICE application.

INCONTROL for z/OS Utilities Guide

Describes utilities designed to perform specific administrative tasks that are available to INCONTROL products.

Introduction to Control-M/Restart

This chapter includes the following topics:

Overview	18
The difference between rerun and restart	18
Main Control-M/Restart capabilities	18
Main components	20
Control-M job scheduling definition	20
The Control-M monitor	21
The CONTROLR step	21
Control-M/Restart parameter members	21
Control-M Active Environment screen	22
Control-M/Restart online utilities	23
Reporting facility	23
Control-M/Restart under Control-M	24
Defining restart parameters in the job scheduling definition	24
Basic Control-M/Restart process overview	25
Control-M/Restart components and concepts	26
Standalone Control-M/Restart	32
Data set cleanup prior to the original run	32
Maintaining previous runs in the History Jobs file	33

Overview

Control-M/Restart is an automated job restart system, and it also performs many functions not related to restart. It is primarily designed to work with jobs that were run under Control-M, and many of its features utilize Control-M capabilities. However, it can also work on jobs that did not run under Control-M. In this case, Control-M/Restart works in standalone mode, and it does not have the full range of capabilities that are available when Control-M/Restart works under Control-M.

This chapter presents a brief introduction to Control-M/Restart features and functionality.

The difference between rerun and restart

To understand what Control-M/Restart does, it is necessary to distinguish between job rerun and job restart.

Job rerun is the re-execution of a scheduled job from the beginning. For example, if a job fails, the entire job can be rerun.

At best, rerunning a job can waste processing time on already successfully completed job steps. And unless certain precautions are taken, if successful job steps from the prior run performed updates before the job failed, rerunning the job can create problematic results by repeating those updates.

Job restart is the re-execution of a job from a particular step. In general, the results of successful job steps from before the failure are utilized, and re-execution continues from the end of the last successful step. Many complex decisions are made and several necessary tasks are performed during this process. These are described briefly in this chapter.

Main Control-M/Restart capabilities

Control-M/Restart provides the following major capabilities:

- Restart

Performing job restart is the main function of Control-M/Restart. When job restart is necessary, Control-M/Restart automates restart by identifying at which step to initiate a job restart and by performing necessary tasks (described later) to ensure that job restart is error-free.

This capability is available both for restarts under Control-M and standalone restarts.

- Data set cleanup and Prevent-NCT2 processing

Another important function of Control-M/Restart is data set cleanup, which is described in [“Data set cleanup prior to the original run”](#) on page 32.

Before restarts and reruns, Control-M/Restart automatically performs data set cleanup. It does not have to be requested.

Data set cleanup can also be performed by request prior to the original job run:

- When the data set cleanup request is connected to the original job run request, it is termed Prevent-NCT2 processing.

The term is derived from the error message generated following an attempt to catalog a data set that was already cataloged. The error message indicates a reason of NOT CATLGD for reason code 2. As part of data set cleanup, Control-M/Restart prevents these types of errors.

- When the data set cleanup request is independent of, and not accompanied by, a job run request, no special term is applied and it is called data set cleanup.

- Maintaining Previous Runs in the History Jobs File

Jobs that have already executed and are ready for removal from the Control-M Active Jobs file can be saved in the Control-M History Jobs file (instead of being deleted). Parameters in the Control-M job scheduling definition determine if and when a job is placed in the History Jobs file and how long the job is maintained there.

This capability is available only for jobs submitted under Control-M.

Main components

The following components are critical to Control-M/Restart when it operates under Control-M.

Control-M job scheduling definition

Most Control-M/Restart functions for a job are defined using parameters in the job scheduling definition. These parameters can be defined so that Control-M/Restart processing is completely automatic, requiring no manual intervention.

However, if manual intervention is needed, for example, a manual confirmation before a restart under Control-M/Restart, these parameters can be defined accordingly.

[Table 1](#) lists Control-M/Restart functions, and the parameters in the Control-M job scheduling definition that are used to define them.

Table 1 Control-M/Restart Functions and Control-M Job Scheduling Definitions Used to Define Them

Control-M/Restart Function	Control-M Job Scheduling Definition
Job Restart	DO IFRERUN
Archive SYSDATA (defined later in this section) that is necessary for job restart.	AUTO-ARCHIVE
Perform Prevent-NCT2 (data set cleanup) processing prior to, but as part of, the original job run.	PREVENT-NCT2
Determine if and how long a job is retained in the History Jobs file: <ul style="list-style-type: none"> ■ maximum number of days to retain the job ■ maximum number of generations of the job to retain 	<ul style="list-style-type: none"> ■ RETENTION - # OF DAYS TO KEEP ■ RETENTION - # OF GENERATIONS TO KEEP

These parameters are defined using the Control-M Job Scheduling Definition screen (Screen 2). The parameters are described in detail in the job scheduling parameters chapter of the *Control-M for z/OS User Guide*.

The Control-M monitor

The heart of the Control-M Production Control System is the Control-M monitor. The monitor is usually activated as a started task.

The Control-M monitor selects jobs for execution, submits the jobs, tracks the jobs, analyzes job execution results, and so on. The monitor executes user instructions (defined in the job scheduling definition) that describe when and how a job is executed.

Jobs requiring Control-M/Restart processing enter the normal processing flow of Control-M under the management of the Control-M monitor. Additional logic has been added to the Control-M monitor to facilitate handling of Control-M/Restart functions.

The CONTROLR step

The CONTROLR step is a special processing step that is automatically generated by Control-M/Restart and inserted into the JCL of the job. The CONTROLR step provides the necessary instructions for the appropriate Control-M/Restart processing of the job.

When job restart or data set cleanup processing is requested, the CONTROLR step is inserted as the first step of the JCL.

Manual adjustment of the CONTROLR step is permitted.

For details of the CONTROLR step, see [Chapter 3, “The CONTROLR Step and Control Parameters.”](#)

Control-M/Restart parameter members

In the IOA PARM library, the CTRPARM member is used to define many default Control-M/Restart parameters. Several of these parameters impact the way in which Control-M/Restart and the CONTROLR step handle processing.

The Control-M/Restart PARM library contains members that are also used to define Control-M/Restart processing defaults. The \$DEFAULT member in this library contains definitions that apply to all jobs processed by Control-M/Restart. The \$EXCLUDE member identifies data sets to be excluded from Control-M/Restart processing. The \$KEEP member identifies data sets that must not be deleted by Control-M/Restart. And local members in this library define processing defaults that apply to a particular job.

Control-M Active Environment screen

As with any job running under Control-M, the Control-M Active Environment screen (Screen 3) enables the user to see the status of, and manually intervene in the processing of, restarted jobs.

When Control-M/Restart processing has been defined so as to require manual intervention, this intervention is generally performed in the Active Environment screen. For example, if a manual confirmation is required before restart, the confirmation can be entered using the Confirm Restart window in the Active Environment screen.

The Active Environment screen is the gateway to several windows and screens relevant to Control-M/Restart. Below is a list of the windows and screens available from the Active Environment screen. They are described in detail in the online facilities chapter of the *Control-M for z/OS User Guide*.

Table 2 Screens and windows available from the Active Environment screen

Window or Screen	Description
Confirm Restart window	Used to confirm job restart when the DO IFRERUN statement requires manual confirmation
Rerun Restart window	Used to activate the restart when automatic rerun (DO RERUN) for the job is not specified
Restart Step List window	Displays the list of steps from the previous run of the job. The steps can then be selected for use in the Confirm Restart or Rerun Restart window.
Job Order Execution History screen	Displays the execution history of the job. From this screen, the Sysout Viewing screen (that displays the archived SYSDATA of the job) can be accessed.
Sysout Viewing screen	Displays the archived SYSDATA of the job
History Environment Screen	This screen, a special format of the Active Environment screen, displays jobs in the History Jobs file.

Control-M/Restart online utilities

Table 3 describes the Control-M/Restart utilities in the IOA Online Utility facility that are available under ISPF (they are also available as TSO CLISTs).

Table 3 Control-M/Restart Online Utilities

Utility	Description
R1	Control-M/Restart Simulation Simulates restart under Control-M/Restart or Prevent-NCT2 processing.
R2	Dataset Cleanup Performs data set cleanup and adjustments without running the job.
R3	Job Dataset List Prepares the list of permanent data sets used in a job. The list is generated in the Control-M Statistics file.
R4	Control-M/Restart Standalone Performs restarts under Control-M/Restart, or Prevent-NCT2 processing, for jobs not run under Control-M.

Reporting facility

Several Control-M/Restart reports produced by IOA KeyStroke Language (KSL) scripts are provided. KSL is a general purpose language that mimics keystrokes entered in IOA applications. It is described in detail in the *KeyStroke Language (KSL) User Guide*.

Table 4 describes the KSL reports that are provided. Sample outputs for these reports are provided in the *KeyStroke Language (KSL) User Guide*.

Table 4 Control-M/Restart KSL Reports (part 1 of 2)

Report	Description
Manual Restart Confirmation Report	Details restart jobs that were manually released for execution using the Control-M/Restart CONFIRM option within a specified period.
Restart Detail Report	List of restarted jobs executed over a particular period. The report displays the restart job, the restart step, use of the CONFIRM option, and so on.
Last Night Restart History Report	Details the complete execution history of all jobs that were restarted during the previous night. Job start time, end time, restart step and termination condition codes for both successful and unsuccessful restarts are displayed.

Table 4 Control-M/Restart KSL Reports (part 2 of 2)

Report	Description
Restart Time Savings Report	Lists job restarts by Control-M/Restart during the specified period. For each listed job restart, the report provides summary information about the execution time saved as a result of using a Control-M/Restart restart instead of a rerun (number of steps skipped, elapsed time saved, and the CPU time saved). It also provides general information about the job.
Last Night Sysout Scan Summary Report	Provides an execution history for jobs with archived sysouts that ran the previous night. Either the first archived sysout or all archived sysouts can be displayed for the specified jobs.

Control-M/Restart under Control-M

Two separate processes are required for restart under Control-M:

- defining the restart parameters in the job scheduling definition appropriately, so that restart can be performed if it becomes necessary
- activation of the restart process when restart becomes necessary

These are described below.

Defining restart parameters in the job scheduling definition

The Control-M job scheduling definition contains post-processing parameters that tell Control-M what to do following a job run. The ON/DO statements enable specification of particular actions to be performed in particular situations. The job scheduling definition can therefore contain different instructions for what to do in different situations (if the job ends OK, if the job ends NOTOK, if the job abends, and so on).

Restart instructions are generally defined in these ON/DO statements. It is important to note that these parameters are defined in advance of any need to perform a restart. Possible situations requiring restart are anticipated at the time the job scheduling definition is being defined. The job scheduling definitions can, however, be modified at any time.

The ON statement indicates the situation in which the defined restart actions are taken. For example, it may indicate that the defined restart actions are performed in case of an abend.

The DO statements indicate the actions to perform. A DO IFRERUN statement defines restart criteria if the particular ON criteria are satisfied. The DO IFRERUN statement can indicate the step at which the restart must begin, and (if desired) the step at which it must end, and whether manual confirmation is necessary. For the restart to be automatic, a DO RERUN statement must also be defined. The combination of DO IFRERUN and DO RERUN parameters define an automatic restart.

Basic Control-M/Restart process overview

Once a job is submitted under Control-M, a restart may become necessary. The basic restart process is outlined below. Variations to this process are described in [Chapter 3, “The CONTROLR Step and Control Parameters.”](#)

The job is selected for restart

If a job fails and its job scheduling definition indicates that the job is restarted following such a failure, the job can be automatically restarted.

Jobs are placed in WAIT SCHEDULE status in the Active Environment screen until all conditions required for the execution are fulfilled (time limits, prerequisite conditions, Quantitative resources, Control resources, and so on.). When all conditions for the execution of a job have been fulfilled, the JCL of the job to be restarted is prepared for submission.

Any job under Control-M can be restarted, even if the job scheduling definition does not contain restart parameters. In this case, restart is manually requested from the Active Environment screen.

The JCL of the job is prepared for submission

The following steps are performed in the preparation of the JCL of the job for submission:

1. The JCL of the job is retrieved from the appropriate JCL Library.
2. Control-M AutoEdit variables are resolved.

The JCL of the job retrieved from the user library may contain Control-M AutoEdit variables. These AutoEdit variables can be replaced with different values based on how and where the previous runs of the job terminated, using SET VAR and DO SET parameters of the job scheduling definition. If the criteria for replacement of an AutoEdit variable have been met, based on the results of the previous runs of the job, the AutoEdit variables are replaced by the predefined values specified by the user.

3. The CONTROLR step is inserted into the JCL of the job.

Many of the Control-M/Restart facilities that make the job restart process automatic and error-free are activated during execution of this step. This restart information is derived from the restart specifications provided by the user in the job scheduling definition, and from the CTRPARM member.

The JCL of the job is submitted for execution

The JCL of the job is submitted for execution.

The restarted job is tracked and controlled by Control-M

Jobs restarted by Control-M/Restart enter the normal flow of Control-M processing under the management of the Control-M monitor. Therefore, all Control-M tracking and control capabilities apply equally to restarted jobs as well as to originally scheduled production jobs.

Error handling

When Control-M/Restart detects a restart error situation, for example, if a mandatory input data set is missing, it generates a restart error. Control-M/Restart then continues to check and report on all error situations (other missing input data sets in the job, and so on). This provides a report of all errors after the first Control-M/Restart run.

Control-M/Restart components and concepts

The following components and concepts are also important to restarts under Control-M/Restart.

ORDERID

Each job order under Control-M is assigned a unique order ID. As a result, it is possible for multiple job orders to exist for the same job name in the Control-M Active Jobs file. One job order may terminate OK while the other may fail and require a restart. Each job order is considered a unique, totally independent entity, and Control-M/Restart processing is always performed on a specific job order.

SYSDATA

SYSDATA is the term used to designate the following job sysout data sets:

- job log (console messages)
- expanded JCL
- system output messages

SYSDATA data sets are usually produced for each execution of a job or started task; however, not all of these data sets are necessarily present in all cases.

SYSDATA is archived if job restart is to be performed. SYSDATA is important to job restart for the following reasons:

- Control-M/Restart allows the same job to be automatically restarted multiple times. The restart function of Control-M/Restart requires the complete picture of the execution history of a job. Archiving the SYSDATA of jobs processed in the Control-M environment provides that complete picture of the execution history of a job.
- Control-M/Restart facilities that are activated within the CONTROLR step require the SYSDATA of all previous runs of the job. These facilities (described below) are
 - restart step adjustment
 - file catalog and GDG adjustment
 - Condition Code and Abend Code Recapture

Even if a job finished executing OK, it can be manually rerun or restarted at a user-specified job step. In this case, a complete history of previous executions of the job is required by Control-M/Restart facilities.

SYSDATA archiving is requested by appropriately filling in the AUTO-ARCHIVE parameter and its subparameters in the Control-M job scheduling definition. It is performed by Control-M during job post-processing; the SYSDATA is compressed and written to the specified data set.

In certain situations, SYSDATA archiving is not desirable and is not requested (for example, cyclic started tasks).

The user can view SYSDATA of previous runs of a requested job order online. For more information, see [“Job Order Execution History screen” on page 22](#) and [“Sysout Viewing screen” on page 22](#).

Data set cleanup and Prevent-NCT2 processing

Before executing a restart job, catalog and VTOC maintenance are often required in order to prevent file-related errors during the processing of the restarted job.

When a job tries to create a data set that already exists or that has a name that is already cataloged, the job may fail with a `DUPLICATE DATASET ON VOLUME` error, or a `NOT CATLGD 2` error. As a result, the production workflow continues using an incorrect version of the data set. In either case, the impact on the production workflow can be severe. This problem is especially likely in non-restart reruns. Therefore, data set cleanup is necessary.

The data set cleanup process automatically performs all required catalog adjustment. It accesses the `SYSDATA` of previous runs of the job order to analyze file creation and deletion and catalog information. Since a job may fail multiple times, analysis of the `SYSDATA` begins with the archived `SYSDATA` of the most recent non-restarted run.

As part of data set cleanup, Control-M/Restart

- deletes and uncatalogs the old data sets
This prevents `DUPLICATE DATSET ON VOLUME` and `NOT CATLGD 2` errors.
- performs Generation Data Set (GDG) Adjustment (described below)

The user can, however, exclude files from data set cleanup if desired, in either of the following ways:

- by specifying the names of the data sets to be excluded in appropriate control statements that are placed in a user-defined library member
For more information, see [“EXCLUDE DSN parameter” on page 69](#).
- by specifying the DD name in the appropriate parameter member
For more information, see [“Format of the \\$EXCLUDE member” on page 74](#).

Control-M/Restart automatically performs data set cleanup prior to any restart.

Data set cleanup can also be performed even prior to the original run of a job. This can be important because data sets accessed by the job can have `DUPLICATE DATA SET` or `NOT CATLGD 2` errors that were generated by an entirely different job. As mentioned earlier in this chapter

- when data set cleanup is performed as part of the original job request, it is called Prevent-NCT2 processing
- otherwise (that is, when performed independently of the original job request), the term “data set cleanup” is used

For details, see [“Data set cleanup prior to the original run” on page 32](#).

Automatic GDG adjustment

Generation data set (GDG) bias numbers must be adjusted so that the relative references to them within the restarted job refer to the correct generation of the data set.

For example, adjusting GDG bias numbers enables a job that creates data set A.B(+1) in STEP1 and reads A.B(+1) in STEP2 to be successfully restarted in STEP2 without manually changing the JCL relative generation number from +1 to 0.

Because it works completely automatically, the GDG Adjustment facility allows the user to restart jobs without being concerned about the technical details of GDG maintenance.

Because Control-M/Restart can handle jobs that dynamically allocate GDG data sets, but does not perform adjustments for such data sets, it may be necessary to exclude dynamically allocated GDG files from Control-M/Restart processing when these files are referenced both through JCL and by dynamic allocation.

Recoverable and nonrecoverable job steps

Restart of a job must begin at a job step that ensures re-creation of all deleted data sets required as input to the steps to be processed in the restart job. Such a step is called a recoverable job step.

Nonrecoverable job steps are steps that can result from any of the following situations:

- The step contains data sets that are not yet kept or cataloged (meaning, temporary or NEW/PASS data sets) at the point the job failed are deleted by the operating system. If these deleted data sets are required as input to job steps to be processed in the job restart, the restart cannot be successfully performed.
- A DD statement contains a VOL=REF parameter that backward references a tape data set that is not the first file on the tape, the step is not recoverable. In this case, the earliest recoverable step is to the step that contains the original volume reference for the tape.
- The step was manually marked as non-restartable. This is discussed in [“Non-restartable step” on page 30](#).

Automatic restart step adjustment

The user normally specifies the step at which the restart must begin, either in a DO IFRERUN statement in the job scheduling definition, or in the Restart window used to manually issue a restart request.

If, however, the restart job step chosen by the user is not recoverable, the Restart Step Adjustment facility automatically can replace the user-specified restart step with the closest recoverable job step prior to the requested restart step, and issues an appropriate message to notify the user of the change.

The facility thereby enables the user to choose the restart step on the basis of application considerations without worrying if the step is actually recoverable.

By default, the Restart Step Adjustment facility is operational and performs step adjustment as needed. However, step adjustment can be disabled in either of the following ways:

- by specifying the appropriate parameter in the Control-M/Restart PARM library. For more information, see [“\[NO\]STEPADJUST parameters” on page 72](#).
- by specifying N (No) in the STEP ADJUSTMENT field in the Rerun/Restart or Confirm Restart window

If step adjustment is needed but step adjustment was disabled, job restart is terminated with a non-zero return code.

Non-restartable step

The user can label any steps as non-restartable steps. Restart cannot start at a step that is defined as a non-restartable step, even if the step would otherwise be recoverable. When the Restart Step adjustment facility arrives at a non-restartable step, it continues rolling back to a preceding step.

Defining steps as non-restartable steps can possibly cause the restart to not be performed. For example if the step adjustment reaches the first job step but that step is defined as a non-restartable step, restart cannot be performed.

A step can be defined as a non-restartable step in either of two ways:

- A special DD statement can be placed in the JCL of the job. This impacts restarts of that job only. For more information, see [“Indicating non-restartable steps: CTRNORST DD” on page 80](#).

- An appropriate parameter definition can be placed in the Control-M/Restart PARM library. Depending on which member in the library is used, the parameter can apply to all jobs or only to the relevant job. For more information, see [“NONRESTARTABLE_STEP parameter” on page 71](#)

Condition code recapture and abend code recapture

Sometimes the decision whether to execute a particular step is dependent upon the execution results (resulting condition code or abend code) of a previous step. The COND JCL parameter and IF/THEN/ELSE JCL statements are commonly used to establish this dependency.

For example, if the following statement is specified

```
//STEPF EXEC . . . ,COND=(04,EQ,STEPB)
```

STEPF is executed only if STEPB did not terminate with a condition code of 04.

If the backward-referenced step is not executed in the restart run because it was executed in the previous run, the condition code or abend code information from the backward-referenced step would not normally be available for the COND or IF/THEN/ELSE JCL statements.

The Condition Code / Abend Code Recapture facility analyzes the SYSDATA of the previous runs of a job order. It determines the condition codes and abend codes of backward-referenced steps and makes the recaptured values available during the restarted run.

These codes can then be used by the COND parameter and IF/THEN/ELSE JCL statements.

If the ALLRUNS parameter in the CTRPARM member in the IOA PARM library is set to YES, the recaptured codes are also available for Control-M to use when evaluating the previous runs or restarts of a job during post processing. For example, if one step finished successfully in an original run and another step finished successfully after a restart, an ON block containing both criteria are satisfied by the successful step in each of the runs.

By default, condition code recapture and abend code recapture operate automatically. However, these facilities can be suppressed either by

- specifying the appropriate parameters in the Control-M/Restart PARM library
For more information, see [“\[NO\]RECAPTCC/\[NO\]RECAPTABEND parameters” on page 71](#)
- specifying N (No) in the RECAPTURE CONDITION CODES and/or RECAPTURE ABEND CODES fields of the Rerun/Restart or Confirm Restart window

Standalone Control-M/Restart

If a job that did not run under Control-M (for example, an unscheduled job that does not have a job scheduling definition) requires restart, the restart can be requested from the Control-M/Restart Standalone panel. This panel corresponds to the R4 Control-M/Restart utility.

To perform Standalone restart under Control-M/Restart, access the R4 utility (or activate CLIST CTCCTR in the TSO Command Processor).

The Control-M/Restart Standalone panel is described in detail in [“Operating Control-M/Restart in standalone mode” on page 39](#).

Data set cleanup prior to the original run

As discussed under [“Control-M/Restart components and concepts” on page 26](#), data set cleanup is automatically performed as part of restart and non-restarted rerun processing, but can also be performed prior to the original job run, as follows:

- Automatic Prevent NCT2 processing can be defined for all jobs by setting the NCAT2 parameter in the CTRPARM member in the IOA PARM library to YES. Data set cleanup is then performed prior to each original job run. This is applicable only to jobs that are run under Control-M.
- Automatic Prevent NCT2 processing can be defined for specific jobs by specifying Y (Yes) for the PREVENT-NCT2 parameter in the corresponding Control-M job scheduling definitions. Data set cleanup is then performed prior to the original runs of those jobs. The PREVENT-NCT2 parameter is described in detail in the *Control-M for z/OS User Guide*.
- The Data Set Cleanup Online Utility (R2) is used to request data set cleanup without an accompanying job run. A CONTROLR step is inserted in the job stream and the edited job JCL is submitted. The CONTROLR step performs the necessary data set adjustment (including step adjustment, if needed) and then stops. No further job steps are executed.

The R2 utility is available only for jobs that have a Control-M job scheduling definition. It is described in detail in [Chapter 2, “Online Facilities.”](#)

- For jobs without a Control-M job scheduling definition, Prevent-NCT2 processing (data set cleanup prior to the original run) can be requested by selecting Prevent-NCT2 as the type of processing in the Control-M/Restart Standalone panel (the R4 online utility). The utility is described in [“Operating Control-M/Restart in standalone mode” on page 39](#).

Maintaining previous runs in the History Jobs file

Under Control-M, active jobs are maintained in the Active Jobs file. Once these jobs are ended and likely no longer needed, they are generally deleted from the Active Jobs file during maintenance. However, if Control-M/Restart is used at the site, these job runs can be placed in the History Jobs file before being deleted from the Active Jobs file, in case they are needed again. Jobs in the History Jobs file can be restored back to the Active Jobs file.

Whether a job is placed in History Jobs file, and for how long it remains, depends on either of two RETENTION parameters in the job scheduling definition:

- The RETENTION - # OF DAYS TO KEEP parameter indicates the maximum number of days the job remains in the History Jobs file before being deleted.
- The RETENTION - # OF GENERATIONS TO KEEP parameter indicates the maximum number of generations of the job to keep in the History File. Once that number of generations is reached, older job runs are deleted for each new job run added to the file.

Retention of jobs in the History Jobs file is available only for jobs that are run under Control-M.

Online Facilities

This chapter includes the following topics:

Control-M/Restart under Control-M	36
Job scheduling definition parameters	36
Control-M/Restart windows and screens available from the Control-M Active Environment screen	37
Operating Control-M/Restart in standalone mode	39
Parameters of the Control-M/Restart Standalone panel	40
Control-M/Restart online utilities	43
R1: Control-M/Restart Simulation facility	44
R2: Control-M/Restart data set cleanup	48
R3: Control-M/Restart Job Data Set List utility	52
KeyStroke Language utility	55

Control-M/Restart under Control-M

For any job that runs under Control-M, scheduling parameters for the original run, rerun parameters, and Control-M/Restart processing instructions, are all defined in the Control-M job scheduling definition. Control-M/Restart instructions include restart and data set cleanup parameters. These parameters are generally defined through the Control-M Job Scheduling Definition screen (Screen 2).

When manual intervention is required, it is generally performed in the Control-M Active Environment screen (Screen 3).

Job scheduling definition parameters

The parameters in the Control-M Job Scheduling Definition screen that are described in [Table 5](#) relate specifically to Control-M/Restart. Job scheduling definition parameters, and their usage, are described in detail in the *Control-M for z/OS User Guide*.

Table 5 Job Scheduling Definition Parameters

Parameter	Description
AUTO-ARCHIVE and subparameters SYSDB, MAXDAYS and MAXRUNS	Controls archiving of SYSDATA that is necessary for job restart
DO IFRERUN	<p>Defines restart steps and determines whether manual confirmation of restart is required</p> <p>FROM and TO parameters in the DO IFRERUN statement define the desired starting and ending steps for the restarted job.</p> <p>The CONFIRM parameter in the DO IFRERUN statement determines whether manual confirmation of restarts is required.</p>
PREVENT-NCT2	Performs data set cleanup prior to the original job run
RETENTION - # OF DAYS TO KEEP	Specifies the maximum number of days to retain a job in the History Jobs File
RETENTION - # OF GENERATIONS TO KEEP	Specifies the maximum number of generations of a job to keep in the History Jobs File

The parameters in the Control-M Job Scheduling Definition screen that are described in [Table 6](#) are available even without Control-M/Restart, but can be very important to job restart.

Table 6 Control-M Job Scheduling Parameters Available Without Control-M/Restart

Parameter	Description
SET VAR and DO SET	Define Control-M AutoEdit variables
DO RERUN	Requests automatic rerun. This parameter must be specified if the restart (as defined in the DO IFRERUN statement) is to be completely automatic (that is, not requiring manual input).
MAXRERUN	Determines the maximum number of allowable reruns or restarts
RERUNMEM	Specifies the JCL member that is used for the rerun

Control-M/Restart windows and screens available from the Control-M Active Environment screen

The following windows and screens directly related to Control-M/Restart are accessible from the Control-M Active Environment screen. They are described in detail in the *Control-M for z/OS User Guide*.

Table 7 Screens and Windows Available from the Active Environment Screen (part 1 of 2)

Window or Screen	Description
Confirm Restart window	Opened by specifying Option C (Confirm) for a job in the Active Environment screen when manual confirmation of restart is requested in the job scheduling definition (in the DO IFRERUN statement). From this window, the Restart Step List window, containing the list of the job's steps, can be opened.
Rerun Restart window	Opened by specifying Option R (Rerun) for a job in the Active Environment screen when automatic rerun for the job is not performed. From this window, the Restart Step List window, containing the list of the job's steps, can be opened.
Restart Step List window	Opened by specifying a question mark (?) in the From Step or To Step fields in the Confirm Restart or Rerun Restart window. It displays the list of steps from the previous run of the job. The steps can then be selected for use in the Confirm Restart or Rerun Restart window.

Table 7 Screens and Windows Available from the Active Environment Screen (part 2 of 2)

Window or Screen	Description
Job Order Execution History screen	Opened by specifying Option V (View Sysout) for a job in the Active Environment screen. This screen displays the execution history of the job. From this screen, the Sysout Viewing screen (that displays the archived SYSDATA of the job) can be accessed.
Sysout Viewing screen	Opened by specifying Option S (Sysout Viewing) or the V (Viewall) command in the Job Order Execution History screen. This screen displays the archived SYSDATA of the job.
History Environment Screen	Opened by specifying the HI (History) command in the Active Environment screen. This screen is a special format of the Active Environment screen. It displays jobs in the History Jobs file.

Actions frequently performed by Control-M/Restart users in the Active Environment screen

Actions frequently performed by Control-M/Restart users in the Active Environment screen are described below:

- Define the Show Screen Filter window so that only WAIT CONFIRMATION jobs are displayed.

The Show Screen Filter window can filter the display on the Active Environment screen so that, for example, only jobs that are waiting confirmation are displayed.

- Confirm jobs awaiting restart confirmation.

You can view and confirm jobs that are waiting confirmation using the Active Environment screen. Prior to providing manual confirmation, you can view the job step selected by Control-M/Restart at which the restart is attempted. This selection may be the result of processing a DO IFRERUN \$ABEND, \$FIRST.ABEND or \$EXERR specification. You can also view a list of the job steps in the Restart Step List window and select a different step for restart prior to confirming the job.

- Edit the JCL of the job before it is submitted for restart.

The JCL can be edited directly using the JCL Edit facility (option J (JCL) of the Active Environment screen).

- View SYSDATA of previous runs of a job.

The user can check the action taken by the Control-M/Restart facilities by viewing the SYSDATA of the previous runs of the job. The SYSDATA of all previous runs of the same job order is available for online viewing.

- View log of significant events for restarted jobs.

The IOA Log contains automatically generated messages that record significant events in the life of jobs restarted by Control-M/Restart and other Control-M production jobs. The user can review this information online using Option L (Log) in the Active Environment screen (or using the IOA Log screen).

Operating Control-M/Restart in standalone mode

For non-Control-M jobs, Control-M/Restart processing information cannot come from a job scheduling definition nor can it be specified in the Control-M Active Environment screen.

In this case, another online interface is provided - the Control-M/Restart Standalone panel. This panel is used to specify processing information to Control-M/Restart for jobs not under Control-M. After Control-M/Restart performs its regular Control-M/Restart processing (Restart or Prevent-NCT2), it passes execution control to the job steps, where the job is executed under MVS (without Control-M processing).

The Control-M/Restart Standalone panel, which is illustrated in [Figure 1](#), can be displayed in the following ways:

- Select Option R4 from the IOA Online Utilities menu. The IOA Online Utilities menu is displayed by requesting Option 6 on the IOA Primary Option menu under ISPF, or by activating CLIST IOAUTIL from the TSO Command Processor.
- Activate CLIST CTCCTR in the TSO Command Processor.

Figure 1 Control-M/Restart Standalone Panel

```

----- Control-M/RESTART STANDALONE -----
COMMAND ==>

GENERAL PARAMETERS:
ACTION REQUIRED      ==>          R -Restart; P -Prevent NCT2
TRACE MODE:        ==>          . . . . .
JCL LIBRARY        ==>          CTM.PROD.JCL
MEMBER             ==>          Member name

RESTART PARAMETERS:
JOBNAME            ==>          JES jobname
JOBID              ==>          Numeric portion of JES jobid
FIRST RESTART ?    ==>          Y -First; N -Subsequent
FROM PGMSTEP       ==>          ($FIRST/pgmstep name)
FROM PROCSTEP      ==>          (Optional)
TO PGMSTEP         ==>          (Optional)
TO PROCSTEP        ==>          (Optional)

AUTOEDIT PARAMETERS:
OWNER              ==>          N29
WDATE              ==>          07 07 00  (DD MM YY)
ODATE              ==>          07 07 00  (DD MM YY)

ENTER YES TO CONTINUE ==>

```

Either of two types of Control-M/Restart processing can be requested:

- To request a job restart, specify R (Restart) in the ACTION REQUIRED field.
- To request Prevent-NCT2 processing (data set cleanup prior to the original job run), specify P (Prevent NCT2) in the ACTION REQUIRED field.

After specifying the type of request, fill in the rest of the parameters of the panel and press **ENTER** to process the request.

To exit the Standalone panel, press **END (PF03/PF15)**.

Parameters of the Control-M/Restart Standalone panel

General parameters

Always specify the parameters described in [Table 8](#).

Table 8 General Parameters of the Control-M/Restart Standalone Panel

Parameter	Description
ACTION REQUIRED	Control-M/Restart action to be performed. Mandatory. Valid values are: <ul style="list-style-type: none"> ■ R (Restart) – performs a restart under Control-M/Restart ■ P (Prevent NCT2) – performs a data set cleanup prior to original job execution
TRACE MODE	Diagnostic tool that allows debugging in Control-M/Restart. Optional. Note: Do not use this parameter unless specifically requested by BMC Software Customer Support.
JCL LIBRARY	Library that contains the JCL for the job. Mandatory.
MEMBER	Name of the member containing the JCL for the job. Mandatory.

Restart parameters

The parameters described in [Table 9](#) are filled in only if action R (Restart) was requested.

Table 9 Restart parameters of the Control-M/Restart Standalone panel (part 1 of 2)

Parameter	Description
JOBNAME	JES name of the job. Mandatory.
JOBID	Numeric portion of the JES job ID from the most recent (last previous) execution. Mandatory. This is discussed in “Multiple restarts of a job” on page 43 .
FIRST RESTART	Whether restart is being requested for the first time for the job. This is discussed in “Multiple restarts of a job” on page 43 . Mandatory. Valid values are: <ul style="list-style-type: none"> ■ Y (Yes) – This is the first restart request for the job. Default. ■ N (No) – Restart has already been performed for the job. This is a subsequent request. Note: To perform a restart of a previously restarted job <ul style="list-style-type: none"> ■ restart must be performed from the same TSO user that performed the first restart ■ the temporary files allocated by the previous invocation of the standalone utility must still exist
FROM PGMSTEP	Name of the program step at which a job restart is to be attempted. Mandatory.
FROM PROCSTEP	Name of the procedure step at which a job restart is to be attempted. Optional.

Table 9 Restart parameters of the Control-M/Restart Standalone panel (part 2 of 2)

Parameter	Description
TO PGMSTEP	Name of the program step at which a restarted job is to terminate. Optional.
TO PROCSTEP	Name of the procedure step at which a restarted job is to terminate. Optional.

AutoEdit parameters

The parameters described in [Table 10](#) are optional.

Table 10 AutoEdit Parameters of the Control-M/Restart Standalone Panel

Parameter	Description
OWNER	User ID of the job owner. Optional. The panel is displayed with the TSO user ID.
GLOBAL	AutoEdit library containing globally defined AutoEdit library variables. Mandatory. The panel is displayed with the site-defined default.
WDATE	Current working date. Mandatory. The panel is displayed with the current date as the default.
ODATE	Original scheduling date of the job. Mandatory. The panel is displayed with the current date as the default.
ENTER YES TO CONTINUE	Confirmation field to prevent the unintentional restart of a job. When blank, the operation is not performed. Specify YES to process the request.

The following points are noted about From Step/Proc and To Step/Proc values:

- To perform processing on the whole job, enter \$FIRST in field From Pgmstep. To perform processing from a specific step, specify the step name in the appropriate FROM PGMSTEP or FROM PROCSTEP fields.
- Pgmstep name can be any specific program step name or \$FIRST. \$FIRST resolves to the first step of the job if procstep name is blank. Otherwise, \$FIRST resolves to the first step in the procedure identified by procstep.
- \$ABEND and \$EXERR are not recognized by Control-M/Restart. Do not specify them as step name values. \$ABEND and \$EXERR are valid only in job scheduling definitions.
- If specifying a procstep name when there are nested procedures, specify the procstep name of the innermost procedure in which the program is included.

— NOTE —

AutoEdit resolution is performed at time of submitting the job. For example, if a job with the %%DATE AutoEdit date variable is submitted the day after the original run, the resolution of the variable varies from that of the original run.

Multiple restarts of a job

It may be necessary to restart a job several times before successful completion of the job. In this case, note the following:

- Once restart of an original job run has been initiated from the Control-M/Restart Standalone panel, do not exit the panel until restart has successfully been completed, even if multiple restarts are required for successful job completion. If you exit the panel before successful completion of the restart, the restart history is lost and successful restart cannot later be performed.
- In the JOBID field, only the most current (latest) job id is specified. When first requesting restart of the original job, use the job id of the original run. If the first restart fails and a second restart is being requested, use the job id of the failed (first) restart; for a third restart, use the job id of the second (failed) restart; and so on.
- In field FIRST RESTART, a value of Y (Yes) is specified only for the first restart attempt following the original run. When subsequent restarts are required, a value of N (No) is specified for all subsequent restart attempts (despite the fact that a different jobid is used for each restart attempt).

Control-M/Restart online utilities

Control-M/Restart has several online utilities. These are available from the IOA Online Utilities menu, which is displayed by requesting Option 6 on the IOA Primary Option menu under ISPF, or by activating CLIST IOAUTIL from the TSO Command Processor.

The R4 utility, which displays the Control-M/Restart Standalone restart panel, has been described under [“Operating Control-M/Restart in standalone mode” on page 39](#). Other available online utilities are described on the following pages.

R1: Control-M/Restart Simulation facility

The Control-M/Restart Simulation Facility simulates restart or data set cleanup processing under Control-M/Restart. It can be used to validate the results of Control-M/Restart processing and the AutoEdit variable resolution of the job before the job is run in the production environment.

Simulation enables you to see what actions are taken by Control-M/Restart without Control-M/Restart performing updates. The Simulation facility adds a CONTROLR step to the job stream before the edited job is submitted. The job runs and then stops after the CONTROLR step; the utility adds a step that prevents the execution of the other steps in the job. No updates are performed.

— NOTE —

In simulation mode, Control-M/Restart submits the entire job. The operating system does not “know” when the job is submitted that the only step that will run is the Control-M/Restart step. The result is that the operating system does its standard look-ahead file allocation processing. This may cause the system to call for tape mounts when the job starts to execute. No data on these files will be lost, nor will the tapes be uncataloged or scratched.

The output of the simulation process is a standard print file containing

- input control statements
- messages about the analyzed submitted job

The output shows relevant data, such as which data sets are uncataloged, how GDG adjustments are performed, from which step the job is restarted, and so on.

The Simulation facility is available only for jobs run under Control-M.

The Control-M/Restart Simulation panel ([Figure 2](#)) can be displayed in the following ways:

- Select Option R1 in the IOA Online Utilities menu. The IOA Online Utilities menu is displayed by requesting Option 6 on the IOA Primary Option menu under ISPF, or by activating CLIST IOAUTIL from the TSO Command Processor.
- Activate CLIST CTRCSIM from the TSO Command Processor.

To exit the Control-M/Restart Simulation panel without activating the utility, press **END (PF03/PF15)**.

Figure 2 Control-M/Restart Simulation Panel

```

----- Control-M/RESTART SIMULATION -----
COMMAND ==>

ACTION REQUIRED:          ==>          R - Restart Simulation
                              P - Prevent NCT2 Simulation

TRACE MODE:             ==> . . . . .
OPERATION MODE:         ==>          J - JCL, S - SCHEDULE
JCL LIBRARY MODE:
  JCL LIBRARY           ==> CTM.PROD.JCL
  MEMBER NAME           ==>
SCHEDULE LIBRARY MODE:
  SCHEDULING LIBRARY MODE ==> CTM.PROD.SCHEDULE
  TABLE NAME           ==>          JOB NAME      ==>
RESTART PARAMETERS:
  ORDER ID              ==>
  FROM PGMSTEP          ==>          TO PGMSTEP     ==>
  FROM PROCSTEP         ==>          TO PROCSTEP    ==>
AUTOEDIT PARAMETERS:
  OWNER                 ==> N45
  GLOBAL AUTOEDIT LIBRARY ==> CTMP.PROD.PARM
  WDATE                 ==> 08 08 00 (DD MM YY)
  ODATE                 ==> 08 08 00 (DD MM YY)
ENTER YES TO CONTINUE  ==>

```

Either of two types of Control-M/Restart processing can be requested:

- To request job restart simulation, specify **R** (Restart) in the **ACTION REQUIRED** field.
- To request Prevent-NCT2 processing simulation, specify **P** (Prevent NCT2) in the **ACTION REQUIRED** field.

The CTRCSIM utility operates in either JCL Library mode or Scheduling Library mode, according to the parameters you specify in the utility panel:

JCL library mode

This mode becomes operational if you specify a job JCL library and member name.

Do not use this mode if the job contains Control-M AutoEdit variables with values determined by SET VAR or DO SET parameters in the job scheduling definition. Because no job scheduling definition is specified in this mode, those variables are not resolved and the simulation results are not reliable.

Scheduling library mode

This mode becomes operational if you specify a job scheduling definition and its scheduling library and member.

This mode is used if the job contains Control-M AutoEdit variables with values that are determined by SET VAR or DO SET parameters in the job scheduling definition. The specified job scheduling definition points to the appropriate JCL library and member, and in this case, all information necessary for resolution of AutoEdit variables is available.

Parameters of the Control-M/Restart simulation facility

To activate the utility, fill in the parameters, type **YES** in the last field of the screen, and press **ENTER**.

Depending on the desired mode, specify either JCL Library mode or Scheduling Library mode parameters, but not both.

Table 11 Action Required Parameters

Parameter	Description
ACTION REQUIRED	Type of Simulation to perform. Mandatory. Valid values are: <ul style="list-style-type: none"> ■ R (Restart under Control-M/Restart) – This function simulates a job restart. ■ P (Prevent NCT2) – This function simulates data set cleanup including the prevention of DUPLICATE DATASET ON VOLUME and NOT CATLGD 2 errors.
TRACE MODE	Diagnostic tool that allows debugging in Control-M/Restart. Optional. Note: Do not use this parameter unless specifically requested by the BMC Software Customer Support.
OPERATION MODE	Mode in which the Control-M/Restart Simulation facility must operate. Mandatory. Valid values: J (JCL Library mode) or S (Scheduling Library mode). The mode parameters (in Table 12) are mandatory for the selected mode, and must be left blank for the non-selected mode.

Table 12 JCL Library Mode Parameters

Parameter	Description
JCL LIBRARY	Library containing the JCL of the original job submission
MEMBER NAME	Member containing the JCL of the original job submission

Table 13 Schedule Library Mode Parameters

Parameter	Description
SCHEDULE LIBRARY	Name of the library containing the job scheduling definition
TABLE NAME	Name of the table containing the job scheduling definition
JOB NAME	Name of the job scheduling definition

Table 14 Restart Parameters

Parameter	Description
ORDER ID	Job order identification of the specific job run to be restarted. Mandatory.
FROM PGMSTEP	Name of the pgmstep at which a job restart is to be attempted. Optional.
TO PGMSTEP	Name of the pgmstep at which a restarted job is to terminate. Optional.
FROM PROCSTEP	Name of the procstep at which a job restart is to be attempted. Optional.
TO PROCSTEP	Name of the procstep at which a restarted job is to terminate. Optional.

Table 15 AutoEdit Parameters

Parameter	Description
OWNER	Owner of the job. Mandatory. The panel is displayed with the TSO use id.
GLOBAL AUTOEDIT LIBRARY	Library containing globally defined AutoEdit variables. Mandatory. The panel is displayed with the site-defined default.
WDATE	Current working date. Mandatory. The panel is displayed with the current date as the default.
ODATE	Original scheduling date of the job. Mandatory. The panel is displayed with the current date as the default.
Enter YES to continue	Confirmation field to help prevent the simulation jobs from being unintentionally run. When blank, the jobs are not run. Specify YES to enable the job run.

The following points are noted about FROM STEP/PROC and TO STEP/PROC values:

- To perform processing on the whole job, enter \$FIRST in the FROM PGMSTEP field. To perform processing from a specific step, specify the step name in the appropriate FROM PGMSTEP or FROM PROCSTEP fields.

- Pgmstep name can be any specific program step name or \$FIRST. \$FIRST resolves to the first step of the job if procstep name is blank. Otherwise, \$FIRST resolves to the first step in the procedure identified by procstep.
- \$ABEND and \$EXERR are not recognized by Control-M/Restart. Do not specify them as step name values. \$ABEND and \$EXERR are valid only in job scheduling definitions.
- If specifying a procstep name when there are nested procedures, specify the procstep name of the innermost procedure in which the program is included.

NOTE

AutoEdit resolution is performed at time of submitting the job. For example, if a job with the %%DATE AutoEdit date variable is submitted the day after the original run, the resolution of the variable varies from that of the original run.

R2: Control-M/Restart data set cleanup

The Control-M/Restart Dataset Cleanup utility is used to manually request data set cleanup.

The utility places a CONTROLR step in the job stream and submits the job. The CONTROLR step performs the data set adjustment (including step adjustment, if necessary) and then stops. No further job steps are executed (the utility adds a step that prevents the execution of the other steps in the job).

The Control-M/Restart Dataset Cleanup screen ([Figure 3](#)) can be displayed in the following ways:

- Select Option R2 in the IOA Online Utilities menu. The IOA Online Utilities menu is displayed by requesting Option 6 on the IOA Primary Option menu under ISPF, or by activating CLIST IOAUTIL from the TSO Command Processor.
- Activate CLIST CTRCCLN from the TSO Command Processor.

To exit the Control-M/Restart Dataset Cleanup panel without activating the utility, press **END (PF03/PF15)**.

Figure 3 Control-M/Restart Dataset Cleanup Panel

```

----- Control-M/RESTART DATASET CLEANUP -----
COMMAND ==>
TRACE MODE:          ==> . . . . .
OPERATION MODE:      ==>          J - JCL, S - SCHEDULE

JCL LIBRARY MODE:
JCL LIBRARY          ==> CTM.TEST.JCL
MEMBER NAME          ==>

SCHEDULE LIBRARY MODE:
SCHEDULING LIBRARY MODE ==> CTM.PROD.SCHEDULE
TABLE NAME           ==>          JOB NAME   ==>

CLEANUP PARAMETERS:
ORDER ID             ==>
FROM PGMSTEP         ==>          TO PGMSTEP   ==>
FROM PROCSTEP        ==>          TO PROCSTEP   ==>

AUTOEDIT PARAMETERS:
OWNER                ==> N29A
GLOBAL AUTOEDIT LIBRARY ==> CTM.PROD.PARM
WDATE                ==> 09 11 00 (DD MM YY)
ODATE                ==> 09 11 00 (DD MM YY)
ENTER YES TO CONTINUE ==>

```

The CTRCCLN utility operates in either JCL Library mode or Scheduling Library mode, according to the parameters you specify in the utility panel:

JCL library mode

This mode becomes operational if you specify a job JCL library and member name.

Do not use this mode if the job contains Control-M AutoEdit variables with values determined by SET VAR or DO SET parameters in the job scheduling definition. Because no job scheduling definition is specified in this mode, those variables are not resolved and the simulation results are not reliable.

Scheduling library mode

This mode becomes operational if you specify a job scheduling definition and its scheduling library and member.

This mode is used if the job contains Control-M AutoEdit variables whose values are determined by SET VAR or DO SET parameters in the job scheduling definition. The specified job scheduling definition points to the appropriate JCL library and member, and in this case, all information necessary for resolution of AutoEdit variables is available.

Parameters of the Control-M/Restart Dataset Cleanup facility

To activate the utility, fill in the parameters, type **YES** in the last field of the screen, and press **ENTER**.

Depending on the desired mode, specify either JCL Library mode or Scheduling Library mode parameters, but not both.

Table 16 Control-M/Restart Data Set Cleanup Facility Modes

Mode	Description
OPERATION MODE	Mode in which the Control-M/Restart Data Set Cleanup Facility must operate. Valid values: J (JCL Library mode) or S (Scheduling Library mode). Mandatory.
TRACE MODE	Diagnostic tool that allows debugging in Control-M/Restart. Optional. Note: Do not use this parameter unless specifically requested by the BMC Software Customer Support.

Table 17 JCL Library Mode Parameters

Parameter	Description
JCL LIBRARY	Library containing the original job. Mandatory.
MEMBER NAME	Name of the member containing the JCL for the job. Mandatory.

Table 18 Schedule Library Mode Parameters

Parameter	Description
SCHEDULING LIBRARY	Library containing the job scheduling definition. Mandatory.
TABLE NAME	Name of the table containing the job scheduling definition. Mandatory.
JOB NAME	Name of the job scheduling definition. Mandatory.

Table 19 Cleanup Parameters (part 1 of 2)

Parameter	Description
ORDER ID	Job order identification of the specific job run. Mandatory.
FROM PGMSTEP	Name of the pgmstep at which data set cleanup is to be attempted. Mandatory.

Table 19 Cleanup Parameters (part 2 of 2)

Parameter	Description
TO PGMSTEP	Name of the pgmstep at which data set cleanup is to terminate. Optional.
FROM PROCSTEP	Name of the procstep at which data set cleanup is to be attempted. Optional.
TO PROCSTEP	Name of the procstep at which data set cleanup is to terminate. Optional.

Table 20 AutoEdit Parameters

Parameter	Description
OWNER	Owner. Optional. The panel is displayed with the TSO user ID.
GLOBAL AUTO-EDIT LIBRARY	Library containing globally defined AutoEdit variables. Mandatory. The panel is displayed with the site-defined default.
WDATE	Current working date. Mandatory. The panel is displayed with the current date as the default.
ODATE	Original scheduling date of the job. Mandatory. The panel is displayed with the current date as the default.
Enter YES to continue	Confirmation field to prevent the cleanup jobs from being unintentionally run. When blank, the jobs do not run. Specify YES to enable the job run.

Note the following points about FROM STEP/PROC and TO STEP/PROC values:

- To perform processing on the whole job, enter \$FIRST in the FROM PGMSTEP field. To perform processing from a specific step, specify the step name in the appropriate FROM PGMSTEP or FROM PROCSTEP fields.
- Pgmstep name can be any specific program step name or \$FIRST. \$FIRST resolves to the first step of the job if procstep name is blank. Otherwise, \$FIRST resolves to the first step in the procedure identified by procstep.
- \$ABEND and \$EXERR are not recognized by Control-M/Restart. Do not specify them as step name values. \$ABEND and \$EXERR are valid only in job scheduling definitions.
- If specifying a procstep name when there are nested procedures, specify the procstep name of the innermost procedure in which the program is included.

— **NOTE** —

AutoEdit resolution is performed at time of submitting the job. For example, if a job with the %%DATE AutoEdit date variable is submitted the day after the original run, the resolution of the variable varies from that of the original run.

R3: Control-M/Restart Job Data Set List utility

The Control-M/Restart Job Data Set List utility prepares the list of permanent data sets used in a job. The list is generated in the Control-M Statistics file.

The utility allows specification of one job at a time. It works by adding to the job a step that prevents execution of other steps in the job. The job is then submitted. The data sets required are listed in the Statistics file and the job is stopped before it can execute.

This utility is generally run as a preliminary step before generating the Data Set Cross Reference Report, which requires the list of data sets for the job. For more information, see the *INCONTROL for z/OS Utilities Guide*.

— **NOTE** —

The AUTOXREF=Y Control-M/Restart parameter (see the *Control-M/ for z/OS Installation Guide*) can be used instead of the R3 utility. When this parameter is used, and if the Control-M/Restart Prevent NCT2 facility is invoked, the job-data sets cross reference statistical information is accumulated during regular execution of the job.

The Control-M/Restart Job Dataset List panel (below) can be displayed in the following ways:

- Select Option R3 in the IOA Online Utilities menu. The IOA Online Utilities menu is displayed by requesting Option 6 on the IOA Primary Option menu under ISPF, or by activating CLIST IOAUTIL from the TSO Command Processor.
- Activate CLIST CTMJDSN from the TSO Command Processor.

To exit the Control-M/Restart Job Dataset List panel without activating the utility, press **END (PF03/PF15)**.

Figure 4 Control-M/Restart Job Dataset List Panel

```

----- CONTROL-M/RESTART JOB DATASET LIST -----
COMMAND ==>

TRACE MODE:          ==> . . . . .

JCL LIBRARY MODE:
JCL LIBRARY          ==>
MEMBER NAME          ==>

SCHEDULING LIBRARY MODE:
SCHEDULING LIBRARY   ==> CTM.PROD.SCHEDULE
TABLE NAME           ==>
JOB NAME             ==>

AUTOEDIT PARAMETERS:
OWNER                 ==> N04
GLOBAL AUTOEDIT LIBRARY ==> CTM.PROD.PARM
WDATE                 ==> 07 07 00 (MM DD YY)
ODATE                 ==> 07 07 00 (MM DD YY)

ENTER YES TO CONTINUE ==>

```

The CTMJDSN utility operates in either JCL Library mode or Scheduling Library mode, according to the parameters you specify in the utility panel.

JCL library mode

This mode becomes operational if you specify a job JCL library and member name.

Do not use this mode if the job contains Control-M AutoEdit variables with values determined by SET VAR or DO SET parameters in the job scheduling definition. Because no job scheduling definition is specified in this mode, those variables are not resolved and the simulation results are not reliable.

Scheduling library mode

This mode becomes operational if you specify a job scheduling definition and its scheduling library and member.

This mode is used if the job contains Control-M AutoEdit variables with values that are determined by SET VAR or DO SET parameters in the job scheduling definition. The specified job scheduling definition points to the appropriate JCL library and member, and in this case, all information necessary for resolution of AutoEdit variables is available.

Parameters of the Control-M/Restart data set list utility

To activate the utility, fill in the parameters, type **YES** in the last field of the screen, and press **ENTER**.

Depending on the desired mode, specify either JCL Library mode or Scheduling Library mode parameters, but not both.

Table 21 General Parameters

Parameter	Description
TRACE MODE	Diagnostic tool that allows debugging in Control-M/Restart. Optional.
	Note: Do not use this parameter unless specifically requested by BMC Software Customer Support.

Table 22 JCL Library Mode Parameters

Parameter	Description
JCL LIBRARY	Library that contains the job's JCL. Mandatory.
MEMBER NAME	Name of the member containing the JCL for the job. Mandatory.

Table 23 Scheduling Library Mode Parameters

Parameter	Description
SCHEDULING LIBRARY	Name of the library containing the job scheduling definition. Mandatory.
TABLE NAME	Name of the table containing the job scheduling definition. Mandatory.
JOB NAME	Name of the job scheduling definition. Mandatory.

Table 24 AutoEdit Parameters (part 1 of 2)

Parameter	Description
OWNER	User ID of the job's owner. Optional. The panel is displayed with the TSO user ID.
GLOBAL AUTOEDIT LIBRARY	AutoEdit library containing globally defined AutoEdit variables. Mandatory. The panel is displayed with the site-defined default.
WDATE	Current working date. Mandatory. The panel is displayed with the current date as the default.

Table 24 AutoEdit Parameters (part 2 of 2)

Parameter	Description
ODATE	Original scheduling date of the job. Mandatory. The panel is displayed with the current date as the default.
ENTER YES TO CONTINUE	Confirmation field to help prevent unintentional job submission. When blank, the request is ignored. Specify YES to enable the job request.

Note the following points about FROM STEP/PROC and TO STEP/PROC values:

- To perform processing on the whole job, enter \$FIRST in the FROM PGMSTEP field. To perform processing from a specific step, specify the step name in the appropriate FROM PGMSTEP or FROM PROCSTEP fields.
- Pgmstep name can be any specific program step name or \$FIRST. \$FIRST resolves to the first step of the job if procstep name is blank. Otherwise, \$FIRST resolves to the first step in the procedure identified by procstep.
- \$ABEND and \$EXERR are not recognized by Control-M/Restart. Do not specify them as step name values. \$ABEND and \$EXERR are valid only in job scheduling definitions.
- If specifying a procstep name when there are nested procedures, specify the procstep name of the innermost procedure in which the program is included.

NOTE

AutoEdit resolution is performed at time of submitting the job. For example, if a job with the %%DATE AutoEdit date variable is submitted the day after the original run, the resolution of the variable varies from that of the original run.

KeyStroke Language utility

The IOA standard KeyStroke Language (KSL) is a general purpose language that simulates, in batch, keystrokes that are entered in the IOA Online facility. KSL language statements (commands) are specified in programs called scripts.

The most common use of KSL scripts is to generate reports from the IOA Core and INCONTROL product repositories. Utilities are also frequently written in KSL scripts.

Once you are familiar with KSL, you can write your own scripts to create reports and utilities. Once a KSL script is defined it can be reused.

For more information, see the *KeyStroke Language (KSL) User Guide*.

The CONTROLR Step and Control Parameters

This chapter includes the following topics:

Overview	58
CONTROLR step	59
Parameters passed to the CONTROLR step	62
Control parameters in the Control-M/Restart PARM library	68
[NO]CHKSEC parameters	68
EXCLUDE DSN parameter	69
MSGLVL_STD/MSGLVL_FULL parameters	70
NONRESTARTABLE_STEP parameter	71
[NO]RECAPTCC/[NO]RECAPTABEND parameters	71
[NO]STEPADJUST parameters	72
TRCREST and TRCNCT2 parameters	72
UNITNAME parameter	73
Format of the \$EXCLUDE member	74
Format of the \$KEEP member	75

Overview

The CONTROLR step is a special processing step that is automatically generated by Control-M/Restart and inserted into the JCL of the job when Control-M/Restart processing is requested. The CONTROLR step provides the necessary instructions for the appropriate Control-M/Restart processing of the job.

The particular instructions included in the CONTROLR step depend not only on the type of processing requested, but on relevant parameters that can be taken from any of various sources:

- the CTRPARM and CTMPARM members in the IOA PARM library

These are described in the customization section of the *INCONTROL for z/OS Installation Guide*.

- members in the Control-M/Restart PARM library

Table 25 describes the members that can be found in this library.

Table 25 Control-M/Restart PARM Library Members

Member	Description
\$DEFAULT	Parameters defined in this member apply to all jobs processed by Control-M/Restart
Local members	A local member and the parameters it contains are dedicated to, and apply to, a particular job. Parameters in a local member override parameters in the \$DEFAULT member for the particular job.
\$EXCLUDE	This member is used to indicate DD statements and data set names to be excluded from Control-M/Restart processing.
\$KEEP	This member is used to indicate the names of data sets that must not be deleted by Control-M/Restart.

The parameters of the \$DEFAULT (and local) members, and the format of the \$EXCLUDE member, are described below.

- Job scheduling definitions

Parameters in a job scheduling definition override corresponding defaults specified in the CTRPARM member in the IOA PARM library, and override defaults specified in the \$DEFAULT member or local members in the Control-M/Restart PARM library.

- Special DD statements placed in the JCL for specific job steps

These are relevant only to those specific steps of the job and override all other corresponding instructions.

- Windows and screens used to enter manual requests

These parameters override any previously specified parameters, except those specified in special DD statements placed in specific JCL jobs steps in the job.

Although generation of the CONTROLR step is automatic, manual adjustment of the CONTROLR step is permitted.

This chapter contains a description of the CONTROLR step, followed by a description of the control parameters specified in the Control-M/Restart PARM library.

CONTROLR step

The CONTROLR step JCL is listed in [Figure 5](#).

Figure 5 CONTROLR Step JCL

```
//CONTROLR PROC ARCHF=NULLFILE,PRM=
//CONTROLR EXEC PGM=CTRCTR,PARM='&PRM'
//STEPLIB DD DSN=IOA.PROD.LOAD,DISP=SHR
//DAARCH DD DISP=SHR,DSN=&ARCHF
//DACTRCTL DD DSN=CTR.PROD.CTR.PARM,DISP=SHR
//SYSPRINT DD SYSOUT=*
//DATRACE DD SYSOUT=*
//CDAMSNAP DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//DASTAT DD DISP SHR=SHR,DSN=&STATFIL
//DALIST DD SYSOUT=*
```

Files referenced by CONTROLR step DD statements are described in [Table 26](#).

Table 26 Files Referenced by CONTROLR Step DD Statements

File	Description
DAARCH	<p>Relevant only for restarts</p> <p>For a non-NJE job (meaning, the system in which Control-M processes the job for submission is not a node in an NJE network, and the job is not sent to another node for execution), this data set contains a set of pointers to the archived SYSDATA.</p> <p>For an NJE job (meaning the job is sent to another node for execution), this file contains the actual SYSDATA of all the previous runs of this job.</p>
DACTRCTL	<p>Control-M/Restart PARM library, which contains control parameter members. A concatenation of libraries can be specified.</p> <p>Control-M/Restart checks the library for the \$DEFAULT member. The member, if it exists, contains control parameters that apply to all jobs. Control-M/Restart retrieves these processing control parameters (and prints the contents of the member to make known the defaults being used).</p> <p>Regardless of whether the \$DEFAULT member was found, Control-M/Restart then checks the library for a local member for the job (that is, a member with the same name as the job). If a local member for the job is found, Control-M/Restart retrieves control parameter instructions from that member (and prints the contents of the member).</p> <p>If the same parameters exist in both the \$DEFAULT member and the local member, the values in the local member supersede the values in the \$DEFAULT member.</p> <p>Control parameters that can be defined in the Control-M/Restart PARM library are described in “Control parameters in the Control-M/Restart PARM library” on page 68.</p>
SYSPRINT	File or printer to which messages and reports of the CONTROLR step are written
DATRACE	File or printer to which debugging messages are written if problems are encountered in the CONTROLR step. If necessary, BMC Software Customer Support can provide instructions on how to activate debugging messages.

Table 26 Files Referenced by CONTROLR Step DD Statements

File	Description
CDAMSNAP	File or printer to which error messages are written if the CONTROLR step encounters a problem in dynamically allocating the archived (compressed) SYSDATA of the previous runs of the restarted job
DASTAT	Control-M Statistics file, which is used to hold statistics needed by the Data Set Cross-reference facility
DALIST	File containing the list of data sets. The list is generated by the Control-M/Restart Data Set Cross-reference utility.

Note the following points about the CONTROLR step:

- for Restarts

- The CONTROLR step is inserted as the first step of the job to be restarted. Information is inserted in the PARM operand of the CONTROLR step describing how the job is to be restarted (from step, to step, and so on).
- If the job is sent to another node for execution, then for proper analysis of the job, the output must return to the submitting node.

- for Data Set Cleanup

- If the NCAT2 parameter in the CTRPARM member in the IOA PARM library is set to YES, Control-M/Restart performs data set cleanup for original job runs. The CONTROLR step deletes and uncatalogs the old data sets, unless the data set name is specified in an EXCLUDE DSN statement in a member in the Control-M/Restart PARM library. This prevents DUPLICATE DATASET ON VOLUME and NOT CATLGD 2 errors.
- The PREVENT-NCT2 parameter in the Control-M job scheduling definition overrides the site-defined default in the NCAT2 parameter.
- For data set cleanup of non-rerun and non-restarted jobs, the CONTROLR step is inserted as the first step in the job stream and the edited job JCL is submitted. The CONTROLR step performs the necessary data set cleanup (including step adjustment, if necessary) and then stops. No further job steps are executed.

Parameters passed to the CONTROLR step

The EXEC statement of the CONTROLR step contains a PARM parameter that is used to pass information between the Control-M monitor and the CONTROLR step. This information is inserted into the PARM operand by Control-M/Restart logic in the Control-M monitor.

It is possible to use the CTMX002 Control-M user exit and the CTMSE02 Control-M security exit to modify values passed to the CONTROLR step using the PARM operand.

PARM operand information is necessary for the operation of Control-M/Restart facilities that are activated during the execution of the CONTROLR step.

The format of the EXEC statement is

```
//CONTROLR EXEC CONTROLR,  
//  PARM='type,mem,orderid,sysopt,from,to,recapt/adjust,trc,stepcc'
```

CONTROLR is the default procedure name for the CONTROLR step. This default can be modified using the CTRPROC Control-M/Restart parameter in the CTRPARM member in the IOA PARM library. For more information, see the Control-M/Restart installation procedure in the *INCONTROL for z/OS Installation Guide*.

The parameters specified in the CONTROLR step PARM field are described in [Table 27](#).

Table 27 Parameters Specified in the CONTROLR Step PARM Field (part 1 of 6)

Parameter	Description
<i>type</i>	<p>Mode and operation to be performed. Mandatory. This parameter consists of two single-character values: mode and operation.</p> <p>Mode must be one of the following:</p> <ul style="list-style-type: none"> ■ R (Real) – The CONTROLR step uncatalogs data sets and performs GDG adjustment, and so on. ■ S (Simulated) – CONTROLR operates in Simulation mode. Reports are produced to show which data sets are uncataloged, how GDG adjustments are performed, from which step the job is restarted, and so on. However, no actual processing takes place and the job is terminated immediately after the CONTROLR step. <p>This mode can be used by the Control-M/Restart Simulation facility and when manually creating JCL to run the CONTROLR step.</p> <p>Operation must be one of the following:</p> <ul style="list-style-type: none"> ■ R (Restart) – Control-M/Restart performs a restart. ■ 2 (Prevent-NCT2) – Control-M/Restart Prevent-NCT2 processing (data set cleanup prior to, and as part of, the original run). ■ C (Cleanup) – Control-M/Restart performs a data set cleanup only. <p>All combinations of mode and operation are valid.</p>

Table 27 Parameters Specified in the CONTROLR Step PARM Field (part 2 of 6)

Parameter	Description
<i>mem</i>	<p>Control parameter member name. Optional. However, this parameter is normally inserted automatically during job submission.</p> <p>This parameter specifies the name of a user-defined library member that contains control parameters for a specific job.</p> <p>Example:</p> <pre>//CONTROLR EXEC CONTROLR,PARM= 'R2,APO4RUN,,BL,.STEP1,,ACS'</pre> <p>This parameter must be a valid member name from 1 through 8 characters. The default value of this parameter (that is automatically inserted during job submission) is the member name that contains the job JCL, meaning, the value displayed in the MEMNAME fields in the Control-M Zoom screen, or the NAME field in the Control-M Active Environment screen. This parameter can be overridden by a member name specified in the Confirm Restart window or the Rerun Restart window.</p>
<i>orderid</i>	<p>Order ID.</p> <p>The order ID is a unique Control-M job order identifier that is used by Control-M/Restart to provide unique access to the SYSDATA of all previous runs of the job to be restarted. For more information, see “ORDERID” on page 26. Normally, this parameter is automatically inserted during restart job submission. Optional.</p> <p>If specified, <i>orderid</i> must be a valid 5-character Control-M order ID. If not specified, a comma must be specified instead.</p> <p>Example:</p> <pre>//CONTROLR EXEC CONTROLR,PARM= 'RR,,0004F,RL,.STEP1,,ACS'</pre> <p>If this parameter is not specified, the <i>sysopt</i> (Read SYSDATA Indicator) parameter must be specified as BL or BN.</p>

Table 27 Parameters Specified in the CONTROLR Step PARM Field (part 3 of 6)

Parameter	Description
<i>sysopt</i>	<p>Read SYSDATA Indicator. Specifies how the SYSDATA is to be processed by Control-M/Restart. Mandatory. This parameter consists of two 1-character values:</p> <ul style="list-style-type: none"> ■ SYSOUT option—Specifies if and when to read the SYSDATA. Valid values are: <ul style="list-style-type: none"> – R - Read all SYSDATA of previous runs of the same job order ID. If no SYSDATA is found for the job, the CONTROLR step abends with a user abend code or a condition code depending on the value of the ABNDTYP parameter in the CTRPARM member. – B - Bypass the reading of all SYSDATA of previous runs of the same job order ID. This value is used for Prevent NCT2 runs. It is not intended for job restarts. If this value is used for restart runs, functionality of the restart is severely limited: CONTROLR step does not perform condition code recapture or GDG adjustment. – C - Read all the SYSDATA of previous runs of the same job order ID if found. If no SYSDATA is found for this job, the CONTROLR step continues to execute; however, the CONTROLR step does not perform condition code recapture or GDG adjustment. ■ NJE Indicator – Indicates whether the job runs at the same NJE node as Control-M (local) or at a different NJE node than Control-M (remote). This determines the source of SYSDATA. <ul style="list-style-type: none"> – L (Local) - Job runs at the same NJE node as Control-M (local node). – N (NJE) - Job runs at a different NJE node than Control-M (remote node).

Table 27 Parameters Specified in the CONTROLR Step PARM Field (part 4 of 6)

Parameter	Description
<i>from</i>	<p>Restart from <i>procstep.pgmstep</i></p> <p>Specifies the <i>pgmstep</i> (or optionally the <i>procstep.pgmstep</i>) at which the restart of the job is to be attempted.</p> <ul style="list-style-type: none"> ■ <i>procstep</i> – Optional. If specified, it must be from 1 through 8 characters. ■ <i>pgmstep</i> – Mandatory. Valid values are from 1 through 8 characters, preceded by a period (“.”). <p>Example:</p> <pre>PARM='RR, GL04RUN, 0004F, RL, .GLSTEP01, , ACS'</pre>
<i>to</i>	<p>Optional. Restart to <i>procstep.pgmstep</i>.</p> <p>This parameter specifies the <i>pgmstep</i> (or optionally the <i>procstep.pgmstep</i>) at which the restarted job terminates processing. If this parameter is not specified, the job is executed until the last step.</p> <ul style="list-style-type: none"> ■ <i>procstep</i> – Optional. ■ <i>pgmstep</i> – If specified, this value must be from 1 through 8 characters, preceded by a period (“.”). <p>Example:</p> <pre>PARM='RR, GL04RUN, 0004F, RL, .GLSTEP01, .GLSTEP05, ACS'</pre>

Table 27 Parameters Specified in the CONTROLR Step PARM Field (part 5 of 6)

Parameter	Description
<i>recapt/adjust</i>	<p>Instructions for abend code recapture, condition code recapture, and step adjustment for the current restart of the job. Mandatory. This parameter consists of three 1-character values:</p> <p>Abend code recapture instruction. Must be one of the following</p> <ul style="list-style-type: none"> ■ A – Perform abend code recapture. ■ N – Do not perform abend code recapture. ■ D – Perform or do not perform abend code recapture depending on the default defined in the Control-M/Restart PARM library. When no default is defined in the Control-M/Restart PARM library, the default is A (perform the recapture). <p>Condition code recapture instruction. Must be one of the following</p> <ul style="list-style-type: none"> ■ C – Perform condition code recapture. ■ N – Do not perform condition code recapture. ■ D – Perform or do not perform condition code recapture depending on the default defined in the Control-M/Restart PARM library. When no default is defined in the Control-M/Restart PARM library, the default is C (perform the recapture). <p>Step adjustment instruction. Must be one of the following</p> <ul style="list-style-type: none"> ■ S – Perform step adjustment if necessary. ■ N – Do not perform step adjustment. ■ D – Perform or do not perform step adjustment depending on the default defined in the Control-M/Restart PARM library. When no default is defined in the Control-M/Restart PARM library, the default is S (perform the step adjustment).
<i>trc</i>	<p>Diagnostic tracing levels. Control-M passes the current diagnostic tracing levels to Control-M/Restart. The tracing levels can be set or changed using F CONTROLM, TRACE commands. For more information, see the <i>INCONTROL for z/OS Administrator Guide</i>.</p>

Table 27 Parameters Specified in the CONTROLR Step PARM Field (part 6 of 6)

Parameter	Description
<i>stepcc</i>	<p>Assigns a specific condition code to a step during restart (regardless of the step's condition code from the previous job run). Optional. This parameter consists of three values totaling 20 characters:</p> <ul style="list-style-type: none"> ■ <i>procstep</i> – Eight-character name (trailing blanks required) of a procedure step whose condition code is overridden. Optional, but required if the step is in a procedure. ■ <i>pgmstep</i> – Eight-character name (trailing blanks required) of the program step whose condition code is overwritten. Mandatory. ■ <i>code</i> – Four-character numeric condition code used to override any condition code from the same step in the previous run.

Control parameters in the Control-M/Restart PARM library

Control parameter members are defined in the Control-M/Restart PARM library. This library is referenced by the DACTRCTL DD statement of the CONTROLR step. Parameters defined in the \$DEFAULT member apply to all jobs. Parameters defined in a local member apply to the specific job.

[NO]CHKSEC parameters

These parameters determine if Control-M/Restart performs preliminary security checks that can inform you of potential security problems before you run the job. In no case, is security authorization bypassed.

If the CHKSEC parameter is specified, Control-M/Restart checks if the job has security authorization to access all the data sets in the DD statements of the job. If there is a security problem, Control-M/Restart issues warnings that the job is subject to a security failure by MVS.

If the NOCHKSEC parameter is specified, Control-M/Restart does not run a preliminary security check.

These parameters override the default value set by the CHKSEC parameter in the CTRPARM member in the IOA PARM library.

Example

Security checks must not be performed:

```
NOCHKSEC
```

EXCLUDE DSN parameter

The EXCLUDE DSN parameter is used to exclude data sets (databases, SYS1 files, and so on) from data set cleanup processing.

The format of the EXCLUDE DSN parameter is

```
EXCLUDE DSN dataset
```

where *dataset* is the data set name, prefix, suffix or mask

For example, assume that DSN SYS1.PROCLIB is to be excluded from processing by Control-M/Restart:

```
EXCLUDE DSN SYS1.PROCLIB
```

Mask characters are supported as follows:

? represents any one character. For example

```
EXCLUDE DSN SYS?.PROCLIB
```

* represents any number of characters (including no characters). A supplied data set name ending with * acts as a prefix. For example

```
EXCLUDE DSN SYS1*
```

Any number of EXCLUDE DSN statements can be specified.

When excluding GDG data sets, specify qualifiers in the base portion of the data set name only. Do not specify the last qualifier, that is, *GnnnVmm*.

For example, if you want to exclude all data sets in the Generation Data Group USER.TAPEGDG, use one of the following

```
EXCLUDE USER.TAPEGDG
```

```
EXCLUDE USER.TAPEGDG*
```

Do not use

EXCLUDE USER.TAPEGDG.G*

MSGLVL_STD/MSGLVL_FULL parameters

Message level parameters determine the level at which certain Control-M/Restart messages are logged (meaning, whether these messages are logged for each occurrence or only their first occurrence during a run of step CONTROLR). Either of two optional message parameters can be specified.

Table 28 MSGLVL_STD/MSGLVL_FULL Parameters

Parameter	Description
MSGLVL_FULL	Indicates that messages are logged for each occurrence
MSGLVL_STD	Indicates that messages are logged for the first occurrence only. When the same message is subsequently issued (meaning, for the same operation on the same data set in subsequent steps of the job), the message is not logged.

If neither parameter is specified, the default value is determined by the MSGLVL parameter in the CTRPARM member in the IOA PARM library, as described in [Table 29](#).

Table 29 Effect of the MSGLVL parameter on message level parameters

Parameter	Description
MSGLVL=S	Default value is MSGLVL_STD
MSGLVL=F	Default value is MSGLVL_FULL

If the MSGLVL parameter is not defined in the CTRPARM member, the default is MSGLVL_STD.

Example

Report each message for the first occurrence only:

```
MSGLVL_STD
```

NONRESTARTABLE_STEP parameter

This parameter indicates that restart does not begin at the specified steps. It is generally used to prevent restart from certain steps when automatic Restart Step Adjustment is performed. It applies to all occurrences of the specified step, regardless of which job is being run.

The format of the parameter is

```
NONRESTARTABLE_STEP [procstep_name].pgmstep_name
```

If *procstep_name* is blank (or the step is not part of a procedure), the period preceding *pgmstep_name* must still be specified.

As an alternative, the CTRNORST special DD statement can be included in the JCL for a job step in a job. This DD statement prevents restart from the specified job step only for the particular job. For more information see [“Indicating non-restartable steps: CTRNORST DD” on page 80](#).

Example

```
NONRESTARTABLE_STEP PROC01.STEP02
```

If, during automatic step adjustment, Control-M/Restart arrives at the PROC01.STEP02 step, it does not allow restart from that step, because this parameter defined that step as a non-restartable step. Instead, Control-M/Restart continues rolling back to the previous restartable step. If step adjustment continues to the first job step and no restart step is found, Control-M/Restart fails the job’s restart. This failure is accompanied by the CTR184S error message.

[NO]RECAPTCC/[NO]RECAPTABEND parameters

These parameters allow or prevent automatic condition and abend code recapture.

If recapture of completion codes (Cnnnn) is not desired, statement NORECAPTCC is specified.

If recapture of abend codes (Unnnn and Snnn) is not desired, statement NORECAPTABEND is specified.

RECAPTCC and RECAPTABEND, which permit recapture of the respective codes, are the defaults and do not need to be explicitly specified.

Example

Abend codes are not recaptured:

NORECAPTABEND

[NO]STEPADJUST parameters

The STEPADJUST parameter permits Automatic Step Adjustment to be performed; the NOSTEPADJUST parameter prevents Automatic Step Adjustment from being performed. As the default, STEPADJUST, which permits Automatic Step Adjustment, does not need to be explicitly specified. If Automatic Step Adjustment is not desired, NOSTEPADJUST is specified.

Step adjustment is accompanied by the CTR183I and CTR039I messages. If step adjustment continues to the first job step and no restart step is found, Control-M/Restart fails the job's restart. This failure is accompanied by the CTR184S error message.

If step adjustment is needed, but step adjustment is disabled, job restart is terminated with a non-zero return code.

Example

Step adjustment is not performed:

NOSTEPADJUST

TRCREST and TRCNCT2 parameters

These parameters determine the trace level with which the CONTROLR step is run during Control-M/Restart processing.

— **NOTE** —

Do not use this parameter unless instructed to do so by BMC Software Customer Support.

Table 30 TRCEST and TRCNCT Parameters

Parameter	Description
TRCREST	Determines the trace level when Control-M/Restart performs a restart
TRCNCT2	Determines the trace level when Control-M/Restart performs Prevent NCT2 processing

Up to eight 1-digit values (1 through 8), separated by commas, can be specified for each of these parameters. Each value represents a particular trace level that is to be set to on. If a parameter is omitted, no trace level is set to on for that parameter.

Example 1

Set trace levels 1,4 and 7 on when the job is restarted:

```
TRCREST 1,4,7
```

Example 2

Set trace levels 1,4 and 7 on when running in Prevent NCT2 mode:

```
TRCNCT2 1,4,7
```

UNITNAME parameter

This parameter allows you to associate a site-defined esoteric unit name with the basic device type (tape or DASD). This informs Control-M/Restart of the type of processing to perform on data sets allocated to that unit.

This parameter may not be necessary. Control-M/Restart usually recognizes esoteric names defined during system I/O initialization. If, however, your site uses products that allow dynamic definition of esoteric unit names, it may be necessary to add these definitions so that Control-M/Restart can recognize the unit names.

The format of the UNITNAME parameter is

```
UNITNAME unit DEVICE TAPE           for tape devices
UNITNAME unit DEVICE DASD          for DASD devices
```

where *unit* is the site-defined esoteric unit name

Any number of UNITNAME statements can be specified.

Examples

The site has defined unit name ACL for tape devices with automatic cartridge loaders. Specify

```
UNITNAME ACL DEVICE TAPE
```

There is a group of DASD devices defined as DISK01, DISK02 and DISK03. Specify

```
UNITNAME DISK0* DEVICE DASD
```

Format of the \$EXCLUDE member

The \$EXCLUDE member is used to identify data set names and DD statements to be excluded from Control-M/Restart processing.

The format used to specify data set name statements in this member is the same format used to specify data set name statements in the \$DEFAULT member.

DD statements are specified in this member in the format shown in [Table 31](#).

Table 31 DD Statements in \$EXCLUDE Member

Column #s	Item
01 through 08	job name
09 through 16	procstep name
17 through 24	pgmstep name
25 through 32	DD name
33 through 80	Comments (optional)

DD statement example

Figure 6 \$EXCLUDE Member DD Statement Example

```
JOB1   PROC1   STEP1   DD1     USED TO EXCLUDE DD1 FROM CTR
JOB2   PROC2   STEP2   DD2     USED TO EXCLUDE DD2 FROM CTR
JOB3   PROC3   STEP3   DD3     USED TO EXCLUDE DD3 FROM CTR
JOB4   PROC4   STEP4   DD4     USED TO EXCLUDE DD4 FROM CTR
JOB5   PROC5   STEP5   DD5     USED TO EXCLUDE DD5 FROM CTR
JOB6   PROC6   STEP6   DD6     USED TO EXCLUDE DD6 FROM CTR
*      *      *      SYSABEND
```

In the example in [Figure 6](#), the first-specified statement excludes the DD name DD1 from the processing of the STEP1 program step in the PROC1 procedure step for the JOB1 job.

Format of the \$KEEP member

The \$KEEP member is used to identify the DD statements relating to data sets that must not be scratched during Control-M/Restart processing.

If the JCL of a job contains a DD statement in which the parameter DISP is set to NEW, and the corresponding data set already exists when Control-M/Restart is invoked, Control-M/Restart automatically changes the value of the DISP parameter to OLD.

DD statements are specified in this member in the format shown in [Table 32](#).

Table 32 DD Statements in \$KEEP member

Column #s	Item
01 through 08	job name
09 through 16	procstep name
17 through 24	pgmstep name
25 through 32	DD name
33 through 80	comments (optional)

NOTE

The \$KEEP member is useful in specifying DD names of checkpoint data sets. When Control-R/RESTART recognizes an existing checkpoint data set specified with DISP=NEW, Control-R does not delete it but changes its disposition to DISP=OLD, enabling the restarted job to use the checkpoint data written by the failed job and to resume processing from the interruption point.

Operation Considerations

This chapter includes the following topics:

Restart after a system crash	76
Multi-CPU environments	76
IF/THEN/ELSE JCL blocks	77
Generation data sets (GDG)	77
\$DEFAULT parameter member	78
UNITNAME definition	78
File exclusion	79
“Helping” Control-M/Restart	79
Indicating non-restartable steps: CTRNORST DD	80
Space for archived sysouts	80
Deleting archived SYSDATA	81
Control-M/Restart and tape management systems	81
Control-M/Restart and SMS	82
Control-M/Restart interface to Control-M/Analyzer	82
Control-M/Restart interface to third party vendor products	82
Sample Control-M/Restart job restart execution	83
CONTROLR step messages	90

Restart after a system crash

Control-M/Restart handling of restart following a system crash depends on the value specified in the SEARCH parameter in the CTRPARM member in the IOA PARM library.

The SEARCH parameter controls the searching for uncataloged data sets on all mounted disks if Control-M/Restart recognizes that the original job run failed due to a system crash. This search is part of data set cleanup. Valid values are described in [Table 33](#).

Table 33 SEARCH Parameter Values

Value	Description
YES	Control-M/Restart starts searching for uncataloged data sets on all mounted disks.
NO	Suppresses this processing; Control-M/Restart does not start searching.
CONFIRM	Control-M/Restart issues the CTR303I and CTR304I messages and then waits for an operator's confirmation before starting to search the data sets.

As noted above, if the SEARCH parameter has a value of CONFIRM, the operator is prompted (Yes/No) for instructions following a system crash. The operator can either confirm the search (YES) or cancel the search (NO).

Multi-CPU environments

Consider the following when running Control-M/Restart in a multi-CPU environment:

- When the original job runs on the same CPU as the Control-M monitor, the DAARCH data set contains a set of pointers to the archived SYSDATA.

If the restart job is also submitted on the same CPU, there are no special concerns. However, if the restart job can be submitted on a different CPU, certain concerns must be addressed if the restart is to be successful:

- The SYSDATA of the previous runs must be archived on a disk that is shared between CPUs. (Read access is sufficient since the Control-M/Restart step only requires read access to the SYSDATA.)
- The SYSDATA must also be in a catalog that can be accessed from all CPUs on which the job can run.

— NOTE —

If different catalogs are used in each CPU, or if JOBCAT or STEPCAT JCL statements are used in the job, the restart job is run in the same CPU in which it originally executed. If the restart job runs in a different CPU than the original one, and different catalogs are used, the results of the restart are unpredictable.

- When the original job runs on a different (remote) node than the Control-M monitor, the DAARCH data set contains the actual archived SYSDATA. Therefore, access of the SYSDATA during restart is not a problem.

However, the considerations concerning catalogs remains. If all systems at the execution node do not share a common catalog, ensure that the restart executes on a system from which the required catalogs can be accessed.

IF/THEN/ELSE JCL blocks

Control-M/Restart can simulate and evaluate IF/THEN/ELSE JCL blocks, and restart the job from within the IF/THEN/ELSE JCL block when necessary, only if the IFADJ parameter in the CTRPARM member in the IOA PARM library is set to YES.

In this case, IF/THEN/ELSE JCL statements (or the COND parameter) operate as if backward-referenced steps were included in the restart run and are able to reference the correct condition code (meaning, the condition code of the backward-referenced step) from the previous unsuccessful run of the job. In this manner, the fact that the backward-referenced step is not included in the restart job is totally invisible to the COND and IF/THEN/ELSE parameters.

— NOTE —

If the IFADJ parameter is set to NO, Control-M/Restart does not handle IF/THEN/ELSE JCL blocks. In this case, do not use Control-M/Restart to restart jobs containing IF/THEN/ELSE blocks because the results are unpredictable.

Generation data sets (GDG)

Adjustment of generation number by the CONTROLR step is not done by modifying the JCL of the job. The original JCL may actually be in an invoked procedure that cannot be modified.

Instead, Control-M/Restart modifies the reference to the real name of the generation data set. Every generation number in a given job run relates to a specific data set name. Control-M/Restart retrieves the data set names from the SYSDATA of the previous runs of the job, and replaces the data set names that were chosen by the system in the restart run.

The above action can be detected in the following ways:

- a message in the report produced by the CONTROLR step
- the IEF285I messages of the job

To ensure proper GDG processing, BMC Software recommends that you review the settings of the relevant parameters in the CTRPARM member in the IOA PARM library. These parameters (MODGDGN ENHGDG, IGNFLUSH, and SAMEGDG), are described in the *INCONTROL for z/OS Installation Guide*.

\$DEFAULT parameter member

UNITNAME definition

To determine the location of all data sets, Control-M/Restart uses UNITNAME definition statements in the control parameters to associate esoteric unit names with actual device types.

It is recommended that the \$DEFAULT parameter member contain UNITNAME definition statements to enable Control-M/Restart to locate all required data sets.

Under certain circumstances, Control-M/Restart needs to search for a data set on all the disks that belong to a specified unit (for example, to scratch uncataloged data sets after a computer crash, and the data sets are allocated using the UNIT parameter without a VOL parameter).

For proper location of the data sets, Control-M/Restart uses UNITNAME definitions that are contained (in priority order from highest to lowest) in the control parameter member used for the restart, the \$DEFAULT member of the Control-M/Restart parameter library, and an internal table of UNITNAME definitions. UNITNAME definitions are listed by Control-M/Restart as part of its output. For an example of this listing, see [“Sample Control-M/Restart job restart execution” on page 83](#).

These definitions are accessed when the job is restarted. If a change is made to the UNIT definitions at the site, either after an IPL or dynamically, the UNITNAME definitions for Control-M/Restart must be updated to reflect these changes. If the UNITNAME definitions are incorrect, Control-M/Restart may not perform the restart correctly.

Valid format for UNITNAME definitions is described in [“Control parameters in the Control-M/Restart PARM library” on page 68](#).

File exclusion

BMC Software recommends that this member contain EXCLUDE DSN statements for important data set prefixes or names, such as

- SYS1*
- IPO1*
- databases
- installed software products

“Helping” Control-M/Restart

A basic assumption of Control-M/Restart logic is that the user has not assisted the restart process in any way.

Control-M/Restart is designed to restart exactly the same job. Any modifications made by the user make the job into a different job. If modifications are made, a successful restart of the job cannot be guaranteed. Therefore, you must be careful not to change the JCL, especially in the following ways:

- modifying the name or generation number of a data set
- adding and deleting steps

Exceptions include changing the file size in response to a space abend, for example, Sx37, or changing the name of an input data set. In these cases, you can perform the changes.

You must also not delete or move relevant files, unless absolutely necessary, as in the case of disk damage.

Indicating non-restartable steps: CTRNORST DD

You can indicate that restart not begin at a particular step by specifying the CTRNORST DD statement for the step. During step adjustment, if the recoverable step selected by Control-M/Restart contains the CTRNORST DD statement, step adjustment continues to the preceding recoverable step. If adjustment reaches the first job step and the first job step contains the CTRNORST DD statement, restart is not performed.

The format of the CTRNORST DD statement is

```
//CTRNORST DD DUMMY
```

— NOTE —

For customers who have converted from CA-11 to Control-M/Restart, the following DD statement is also supported for compatibility:

```
//UCC11NR DD DUMMY
```

For more information, see [“NONRESTARTABLE_STEP parameter”](#) on page 71.

Space for archived sysouts

Ensure that enough space is available to archive SYSDATA for all jobs that execute under Control-M and for which a Y value for AUTO-ARCHIVE is specified either explicitly or by default. Control-M allocates space as needed on the devices defined by the AMVOL and AMUNIT parameters in the CTRPARM member in the IOA PARM library, until all available space on the volumes is allocated.

- If SYSDB=Y is specified (recommended)

The SYSDATA of all jobs is written to a common data set until it is filled; then a new data set is automatically allocated. This minimizes the space required in the catalog and in the VTOC on the defined disk.

- If SYSDB=N is specified

Since every job execution results in one cataloged data set, make sure that the VTOC of the defined disks is large enough to contain all the data sets, and that enough space is available in the catalog. It is recommended that a user catalog be defined for the prefix defined in the AMPREFR parameter in the CTRPARM member in the IOA PARM library.

— NOTE —

Do not release unused space from SYSDATA files by automated data management products (such as FDR and DMS/OS).

Deleting archived SYSDATA

Deletion of archived SYSDATA is performed automatically by the Control-M New Day procedure (started task CONTDAY) or by the CTMCAJF utility. For more information about the New Day procedure, refer to the *INCONTROL for z/OS Administrator Guide*.

The New Day procedure deletes archived SYSDATA if the job does not reside in the History Jobs file and either of the following conditions is true:

- The job order is deleted from the Active Jobs file (therefore the archived SYSDATA is no longer needed). A job order is usually deleted from the Active Jobs file after it has completed OK.
- The maximum number of days to retain archived SYSDATA, or the maximum number of job runs for which the SYSDATA is retained, has been exceeded. These values are specified in the MAXDAYS and MAXRUNS subparameters of the AUTO-ARCHIVE parameter in the Control-M job scheduling definition.

Whether, and how long, a job is on the History Jobs file depends on the values of the RETENTION parameters in the job scheduling definition.

Control-M/Restart and tape management systems

The presence or absence of a tape management system (such as Control-M/Tape) determines how Control-M/Restart handles tape volume reuse when a restarted job re-executes steps that created new tape data sets in previous runs.

If a tape management system is in use, Control-M/Restart does not attempt to reuse the same tape volume during the rerun.

When there is no tape management system, Control-M/Restart attempts to reuse the same tape volume during the job rerun.

Presence or absence of a tape management system is indicated in the TAPEMS parameter in the CTRPARM member in the IOA PARM library.

For full functionality of the Control-M/Restart interface to tape management systems, the CTRX001 Control-M/Restart exit may be necessary. For more information, see the CTRX001T and CTRX001Z sample exits in the IOA SAMPEXIT library.

Control-M/Restart and SMS

At sites in which SMS (System Managed Storage) is implemented, BMC Software recommends that you review the setting of the VOLISMS parameter in the CTRPARM member in the IOA PARM library. This parameter is described in the *INCONTROL for z/OS Installation Guide*.

Control-M/Restart interface to Control-M/Analyzer

To ensure functionality of the Control-M/Restart interface to Control-M/Analyzer, CTRX001Q Control-M/Restart Exit may be necessary. For more information, see the sample exit in the IOA SAMPEXIT library.

Control-M/Restart interface to third party vendor products

To ensure functionality of the Control-M/Restart interface to HSM (Hierarchical Storage Manager), the CTRX001H Control-M/Restart Exit may be necessary. For more information, see the sample exit in the IOA SAMPEXIT library.

To ensure functionality of the Control-M/Restart interface to BETA91, the CTRX001B Control-M/Restart Exit may be necessary. For more information, see the sample exit in the IOA SAMPEXIT library.

To ensure functionality of the Control-M/Restart interface to DMS/OS, the CTRX001D Control-M/Restart Exit may be necessary. For more information, see the sample exit in the IOA SAMPEXIT library.

To ensure functionality of the Control-M/Restart interface to the IDCAMS IBM utility and other applications that dynamically allocate files, it may be necessary to set the NFILVS99 parameter in the CTRPARM member in the IOA PARM library to Y (Yes). This parameter is described in the *INCONTROL for z/OS Installation Guide*.

NOTE

Control-M/Restart handles only those data sets that are specified in DD statements in the JCL of jobs. It does not handle dynamically allocated data sets, with the exception of the cases affected by setting the NFILVS99 parameter to Y (Yes).

Sample Control-M/Restart job restart execution

The following is a sample of a job that was restarted by Control-M/Restart. (Lines that are bolded are discussed in notes following the sample execution.) Control-M/Restart was instructed to attempt restart from STEP005 if any job step abended. In the Job Scheduling Definition screen (Screen 2), the parameters illustrated in [Figure 7](#) were entered.

Figure 7 Parameters entered in the job scheduling definition - sample Control-M/Restart job restart execution

```
STEP RANGE ANYSTEP FR (PGM.PROC) STEP001 . TO STEP008 .
STEP RANGE FR (PGM.PROC) . TO .
ON PGMST ANYSTEP PROCST CODES S*** U**** A/O
DO IFRERUN FROM STEP005 . TO . CONFIRM N
DO RERUN
DO
```

The previous run of PRDJBGL5 abended in STEP006.

Figure 8 Sample Control-M/Restart job restart execution

```
J E S 2 J O B L O G -- S Y S T E M F D S F -- N O D E N O D E 1
18.43.51 JOB 3144 IEF677I WARNING MESSAGE(S) FOR JOB PRDJBGL5 ISSUED
18.43.51 JOB 3144 $HASP373 PRDJBGL5 STARTED - INIT 1 - CLASS A - SYS FDSF
18.43.51 JOB 3144 IEF403I PRDJBGL5 - STARTED - TIME=18.43.51
18.44.17 JOB 3144 CTR082I RESTARTING FROM STEP STEP003 . TO STEP STEP009 .
18.44.52 JOB 3144 IEF404I PRDJBGL5 - ENDED - TIME=18.44.52
18.44.52 JOB 3144 $HASP395 PRDJBGL5 ENDED
----- JES2 JOB STATISTICS -----
10 AUG 98 JOB EXECUTION DATE
124 CARDS READ
528 SYSOUT PRINT RECORDS
0 SYSOUT PUNCH RECORDS
36 SYSOUT SPOOL KBYTES
1.01 MINUTES EXECUTION TIME
1 //PRDJBGL5 JOB ,GPL,MSGCLASS=X,CLASS=A, JOB 3144
// MSGLEVEL=(1,1)
***----- SUBMITTED BY CONTROL-M -----
*****
**** S T E P 0 0 1 **
*****
2 //RESTART EXEC PROC=CONTROLR,
// PARM='RR,PRDJBGL5,000BU,RL,.STEP005,ACS'
3 XXCONTROLR PROC ARCHF=NULLFILE, FOR FUTURE USE
```

```

XX          PRM=,
XX          STEPLIB='IOA.PROD.LOAD',          CONTROL-R LOAD LIBRARY
XX          OLPPREFR='CTRO',          OPERATIONS LIBRARY PREFIX
XX          OLVERR='CTRPROD',          OPERATIONS LIBRARY VERSION
XX          OUT='*',
XX          OUTDUMP='Z'
*****
*****  THE CONTROL-R STEP  *****
*****  -----  *****
*****
*****  THIS STEP PERFORMS THE MAIN RESTART TASKS:  *****
*****  - RESTART STEP ADJUSTMENT  *****
*****  - FILE, CATALOG AND GDG ADJUSTMENT  *****
*****  - CONDITION CODE RECAPTURE  *****
*****
*****
4  XXCONTROLR EXEC PGM=CTRCTR,PARM='&PRM',REGION=4000K
5  XXSTEPLIB DD DISP=SHR,DSN=&STEPLIB
6  //DAARCH DD *,DCB=(LRECL=132)
   X/DAARCH DD DISP=SHR,DSN=&ARCHF
7  XXDACTRCTL DD DISP=SHR,DSN=&OLPPREFR..&OLVERR..CTR.PARM
8  XXSYSPRINT DD SYSOUT=&OUT
9  XXDATRACE DD SYSOUT=&OUTDUMP
10 XXCDAMSNAP DD SYSOUT=&OUTDUMP
11 XXSYSABEND DD SYSOUT=&OUTDUMP
12 //STEP001 EXEC PGM=IEBGENER
13 //SYSPRINT DD SYSOUT=*
14 //SYSUT1 DD DISP=SHR,DSN=PRDJBGL.JOBLIB(INFILE)
15 //SYSUT2 DD DSN=PRDJBGL.GDG.GRP07(+1),
   // DISP=(,CATLG,DELETE),UNIT=SYSDA,
   // DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160),
   // SPACE=(TRK,1)
16 //SYSOUT DD SYSOUT=*
17 //SYSIN DD DUMMY
*****
****          S T E P 0 0 2
*****
18 //STEP002 EXEC PGM=PRDJBST
19 //STEPLIB DD DISP=SHR,DSN=PRDJBGL.LOAD
20 //TESTFILE DD DISP=SHR,DSN=PRDJBGL.GDG.GRP07(+1)
*****
****          S T E P 0 0 3
*****
21 //STEP003 EXEC PGM=SORT,REGION=5000K
22 //SORTIN DD DISP=SHR,DSN=PRDJBGL.GDG.GRP07(+1)
23 //SORTOUT DD DSN=&ZMN1,DISP=(,PASS),
   // UNIT=SYSDA,SPACE=(TRK,1),
   // DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160)
24 //SORTWK01 DD UNIT=SYSDA,SPACE=(CYL,(5,25))
25 //SORTWK02 DD UNIT=SYSDA,SPACE=(CYL,(5,25))
26 //SORTWK03 DD UNIT=SYSDA,SPACE=(CYL,(5,25))
27 //SYSPRINT DD SYSOUT=*
28 //SYSOUT DD SYSOUT=*
29 //SYSUDUMP DD SYSOUT=*
30 //SYSIN DD *          GENERATED STATEMENT
*****
****          S T E P 0 0 4
*****
31 //STEP004 EXEC PGM=SORT,REGION=5000K
32 //SORTIN DD DISP=(OLD,PASS),DSN=&ZMN1
33 //SORTOUT DD DSN=PRDJBGL.GDG.GRP07(+2),
   // DISP=(,CATLG,DELETE),UNIT=SYSDA,

```

```

//          DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160),
//          SPACE=(TRK,1)
34 //SORTWK01 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
35 //SORTWK02 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
36 //SORTWK03 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
37 //SYSPRINT DD  SYSOUT=*
38 //SYSOUT   DD  SYSOUT=*
39 //SYSUDUMP DD  SYSOUT=*
40 //SYSIN    DD *          GENERATED STATEMENT
*****
****          S T E P 0 0 5
*****
41 //STEP005  EXEC PGM=SORT,REGION=5000K
42 //SORTIN  DD  DISP=SHR,DSN=PRDJBGL.GDG.GRP07(+2)
43 //SORTOUT DD  DSN=PRDJBGL.GDG.GRP08(+1),
//          DISP=(,CATLG,DELETE),UNIT=SYSDA,
//          DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160),
//          SPACE=(TRK,1)
44 //SORTWK01 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
45 //SORTWK02 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
46 //SORTWK03 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
47 //SYSPRINT DD  SYSOUT=*
48 //SYSOUT   DD  SYSOUT=*
49 //SYSUDUMP DD  SYSOUT=*
50 //SYSIN    DD *          GENERATED STATEMENT
*****
****          S T E P 0 0 6
*****
51 //STEP006  EXEC PGM=PRDJBST
52 //STEPLIB DD  DISP=SHR,DSN=PRDJBGL.LOAD
*****
****          S T E P 0 0 7          **
*****
53 //STEP007  EXEC PGM=SORT,REGION=5000K
54 //SORTIN  DD  DISP=OLD,DSN=&ZMN1
55 //SORTOUT DD  DSN=PRDJBGL.GDG.GRP08(+2),
//          DISP=(,CATLG,DELETE),UNIT=SYSDA,
//          DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160),
//          SPACE=(TRK,1)
56 //SORTWK01 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
57 //SORTWK02 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
58 //SORTWK03 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
59 //SYSPRINT DD  SYSOUT=*
60 //SYSOUT   DD  SYSOUT=*
61 //SYSUDUMP DD  SYSOUT=*
62 //SYSIN    DD *          GENERATED STATEMENT
*****
****          S T E P 0 0 8          **
*****
63 //STEP008  EXEC PGM=SORT,REGION=5000K,COND=(0,NE,STEP002)
64 //SORTIN  DD  DISP=SHR,DSN=PRDJBGL.GDG.GRP08(+2)
65 //SORTOUT DD  DSN=&ZMN2,DISP=(,PASS),
//          UNIT=SYSDA,SPACE=(TRK,1),
//          DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160)
66 //SORTWK01 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
67 //SORTWK02 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
68 //SORTWK03 DD  UNIT=SYSDA,SPACE=(CYL,(5,25))
69 //SYSPRINT DD  SYSOUT=*
70 //SYSOUT   DD  SYSOUT=*
71 //SYSUDUMP DD  SYSOUT=*
72 //SYSIN    DD *          GENERATED STATEMENT
*****

```

```

****                                S T E P 0 0 9                                **
*****
73 //STEP009 EXEC PGM=SORT,REGION=5000K,COND=(0,NE,STEP002)
74 //SORTIN DD DISP=OLD,DSN=&ZMN2
75 //SORTOUT DD DSN=PRDJBGL.GDG.GRPO7(+3),
// DISP=(,CATLG,DELETE),UNIT=SYSDA,
// DCB=(MODEL,RECFM=FB,LRECL=80,BLKSIZE=6160),
// SPACE=(TRK,1)
76 //SORTWK01 DD UNIT=SYSDA,SPACE=(CYL,(5,25))
77 //SORTWK02 DD UNIT=SYSDA,SPACE=(CYL,(5,25))
78 //SORTWK03 DD UNIT=SYSDA,SPACE=(CYL,(5,25))
79 //SYSPRINT DD SYSOUT=*
80 //SYSOUT DD SYSOUT=*
81 //SYSUDUMP DD SYSOUT=*
82 //SYSIN DD * GENERATED STATEMENT
STMT NO. MESSAGE
-
4 IEF653I SUBSTITUTION JCL - PGM=CTRCTR,PARM='',REGION=4000K
5 IEF653I SUBSTITUTION JCL - DISP=SHR,DSN=IOA.PROD.LOAD
6 IEF653I SUBSTITUTION JCL - DISP=SHR,DSN=NULLFILE
7 IEF653I SUBSTITUTION JCL - DISP=SHR,DSN=CTRO.CTRPROD.CTR.PARM
8 IEF653I SUBSTITUTION JCL - SYSOUT=*
9 IEF653I SUBSTITUTION JCL - SYSOUT=Z
10 IEF653I SUBSTITUTION JCL - SYSOUT=Z
11 IEF653I SUBSTITUTION JCL - SYSOUT=Z
54 IEF648I INVALID DISP FIELD- PASS SUBSTITUTED
74 IEF648I INVALID DISP FIELD- PASS SUBSTITUTED
IEF236I ALLOC. FOR PRDJBGL5 CONTROLR RESTART
IEF237I 269 ALLOCATED TO STEPLIB
IEF237I JES2 ALLOCATED TO DAARCH
IEF237I 271 ALLOCATED TO DACTRCTL
IEF237I JES2 ALLOCATED TO SYSPRINT
IEF237I JES2 ALLOCATED TO PRITDBG
IEF237I JES2 ALLOCATED TO CDAMSNAP
IEF237I JES2 ALLOCATED TO SYSABEND
IEF237I 273 ALLOCATED TO SYS00001
IEF285I CTRSYS.JOBSDB.J03009.D1191637.S01.N000100 KEPT
IEF285I VOL SER NOS= WORK01.
IEF237I 263 ALLOCATED TO SYS00002
IEF142I PRDJBGL5 CONTROLR RESTART - STEP WAS EXECUTED - COND CODE 0000
IEF285I IOA.PROD.LOAD KEPT
IEF285I VOL SER NOS= CONT05.
IEF285I JES2.JOB03144.S1000101 SYSIN
IEF285I CTRO.CTRPROD.CTR.PARM KEPT
IEF285I VOL SER NOS= CONT03.
IEF285I JES2.JOB03144.S0000108 SYSOUT
IEF285I JES2.JOB03144.S0000109 SYSOUT
IEF285I JES2.JOB03144.S0000110 SYSOUT
IEF285I JES2.JOB03144.S0000111 SYSOUT
IEF285I CATALOG.USER KEPT
IEF285I VOL SER NOS= D50CAT.

IEF373I STEP /CONTROLR/ START 98222.1843
IEF374I STEP /CONTROLR/ STOP 98222.1844 CPU 0MIN 05.86SEC SRB 0MIN 00.17SEC
VIRT 508K SYS 356K
IEF236I ALLOC. FOR PRDJBGL5 STEP003
IEF237I 26B ALLOCATED TO SORTIN
IEF237I 263 ALLOCATED TO SYS00431
IEF237I 273 ALLOCATED TO SORTOUT
IEF237I 26B ALLOCATED TO SORTWK01
IEF237I 26B ALLOCATED TO SORTWK02
IEF237I 273 ALLOCATED TO SORTWK03

```



```

IEF237I JES2 ALLOCATED TO SYSPRINT
IEF237I JES2 ALLOCATED TO SYSOUT
IEF237I JES2 ALLOCATED TO SYSUDUMP
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I PRDJBGL5 STEP003 - STEP WAS EXECUTED - COND CODE 0000
IEF285I PRDJBGL.GDG.GRP07.G0030V00 KEPT
IEF285I VOL SER NOS= WORK02.
IEF285I CATALOG.USER KEPT
IEF285I VOL SER NOS= D50CAT.
IEF285I SYS98222.T184351.RA000.PRDJBGL5.ZMN1 PASSED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS98222.T184351.RA000.PRDJBGL5.R0000001 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I SYS98222.T184351.RA000.PRDJBGL5.R0000002 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I SYS98222.T184351.RA000.PRDJBGL5.R0000003 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I JES2.JOB03144.S0000114 SYSOUT
IEF285I JES2.JOB03144.S0000115 SYSOUT
IEF285I JES2.JOB03144.S0000116 SYSOUT
IEF285I JES2.JOB03144.SI000102 SYSIN
IEF373I STEP /STEP003 / START 00222.1844
IEF374I STEP /STEP003 / STOP 00222.1844 CPU OMIN 00.36SEC SRB OMIN 00.04SEC
VIRT 776K SYS 240K
IEF236I ALLOC. FOR PRDJBGL5 STEP004
IEF237I 273 ALLOCATED TO SORTIN
IEF237I 26B ALLOCATED TO SORTOUT
IEF237I 263 ALLOCATED TO SYS00432
IEF237I 26B ALLOCATED TO SORTWK01
IEF237I 273 ALLOCATED TO SORTWK02
IEF237I 26B ALLOCATED TO SORTWK03
IEF237I JES2 ALLOCATED TO SYSPRINT
IEF237I JES2 ALLOCATED TO SYSOUT
IEF237I JES2 ALLOCATED TO SYSUDUMP
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I PRDJBGL5 STEP004 - STEP WAS EXECUTED - COND CODE 0000
IEF285I SYS00222.T184351.RA000.PRDJBGL5.ZMN1 PASSED
IEF285I VOL SER NOS= WORK01.
IEF285I PRDJBGL.GDG.GRP07.G0031V00 CATALOGED
IEF285I VOL SER NOS= WORK02.
IEF285I CATALOG.USER KEPT
IEF285I VOL SER NOS= D50CAT.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000004 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000005 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000006 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I JES2.JOB03144.S0000117 SYSOUT
IEF285I JES2.JOB03144.S0000118 SYSOUT
IEF285I JES2.JOB03144.S0000119 SYSOUT
IEF285I JES2.JOB03144.SI000103 SYSIN
IEF373I STEP /STEP004 / START 00222.1844
IEF374I STEP /STEP004 / STOP 00222.1844 CPU OMIN 00.36SEC SRB OMIN 00.04SEC
VIRT 776K SYS 252K
IEF236I ALLOC. FOR PRDJBGL5 STEP005
IEF237I 26B ALLOCATED TO SORTIN
IEF237I 263 ALLOCATED TO SYS00434
IEF237I 273 ALLOCATED TO SORTOUT
IEF237I 26B ALLOCATED TO SORTWK01
IEF237I 273 ALLOCATED TO SORTWK02
IEF237I 273 ALLOCATED TO SORTWK03

```

```

IEF237I JES2 ALLOCATED TO SYSPRINT
IEF237I JES2 ALLOCATED TO SYSOUT
IEF237I JES2 ALLOCATED TO SYSUDUMP
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I PRDJBGL5 STEP005 - STEP WAS EXECUTED - COND CODE 0000
IEF285I PRDJBGL.GDG.GRP07.G0031V00 KEPT
IEF285I VOL SER NOS= WORK02.
IEF285I CATALOG.USER KEPT
IEF285I VOL SER NOS= D50CAT.
IEF285I PRDJBGL.GDG.GRP08.G0023V00 CATALOGED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000007 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000008 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000009 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I JES2.JOB03144.S0000120 SYSOUT
IEF285I JES2.JOB03144.S0000121 SYSOUT
IEF285I JES2.JOB03144.S0000122 SYSOUT
IEF285I JES2.JOB03144.SI000104 SYSIN
IEF373I STEP /STEP005 / START 00222.1844
IEF374I STEP /STEP005 / STOP 00222.1844 CPU OMIN 00.33SEC SRB OMIN 00.04SEC
VIRT 776K SYS 252K
IEF236I ALLOC. FOR PRDJBGL5 STEP006
IEF237I 261 ALLOCATED TO STEPLIB
IEF237I 263 ALLOCATED TO SYS00436
IEF142I PRDJBGL5 STEP006 - STEP WAS EXECUTED - COND CODE 0000
IEF285I PRDJBGL.LOAD KEPT
IEF285I VOL SER NOS= CONT04.
IEF285I CATALOG.USER KEPT
IEF285I VOL SER NOS= D50CAT.
IEF373I STEP /STEP006 / START 00222.1844
IEF374I STEP /STEP006 / STOP 00222.1844 CPU OMIN 00.03SEC SRB OMIN 00.00SEC
VIRT 12K SYS 232K
IEF236I ALLOC. FOR PRDJBGL5 STEP007
IEF237I 273 ALLOCATED TO SORTIN
IEF237I 26B ALLOCATED TO SORTOUT
IEF237I 263 ALLOCATED TO SYS00437
IEF237I 273 ALLOCATED TO SORTWK01
IEF237I 26B ALLOCATED TO SORTWK02
IEF237I 273 ALLOCATED TO SORTWK03
IEF237I JES2 ALLOCATED TO SYSPRINT
IEF237I JES2 ALLOCATED TO SYSOUT
IEF237I JES2 ALLOCATED TO SYSUDUMP
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I PRDJBGL5 STEP007 - STEP WAS EXECUTED - COND CODE 0000
IEF285I SYS00222.T184351.RA000.PRDJBGL5.ZMN1 PASSED
IEF285I VOL SER NOS= WORK01.
IEF285I PRDJBGL.GDG.GRP08.G0024V00 CATALOGED
IEF285I VOL SER NOS= WORK02.
IEF285I CATALOG.USER KEPT
IEF285I VOL SER NOS= D50CAT.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000010 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000011 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I SYS00222.T184351.RA000.PRDJBGL5.R0000012 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I JES2.JOB03144.S0000123 SYSOUT
IEF285I JES2.JOB03144.S0000124 SYSOUT
IEF285I JES2.JOB03144.S0000125 SYSOUT

```

```

IEF285I  JES2.JOB03144.SI000105                SYSIN
IEF373I  STEP /STEP007 / START 00222.1844
IEF374I  STEP /STEP007 / STOP 00222.1844 CPU OMIN 00.33SEC SRB OMIN 00.04SEC
VIRT 776K SYS 252K
IEF202I  PRDJBGL5 STEP008 - STEP WAS NOT RUN BECAUSE OF CONDITION CODES
IEF272I  PRDJBGL5 STEP008 - STEP WAS NOT EXECUTED.
IEF373I  STEP /STEP008 / START 00222.1844
IEF374I  STEP /STEP008 / STOP 00222.1844 CPU OMIN 00.00SEC SRB OMIN 00.00SEC
VIRT 0K SYS 0K
IEF202I  PRDJBGL5 STEP009 - STEP WAS NOT RUN BECAUSE OF CONDITION CODES
IEF272I  PRDJBGL5 STEP009 - STEP WAS NOT EXECUTED.
IEF373I  STEP /STEP009 / START 00222.1844
IEF374I  STEP /STEP009 / STOP 00222.1844 CPU OMIN 00.00SEC SRB OMIN 00.00SEC
VIRT 0K SYS 0K
IEF237I  273  ALLOCATED TO SYS00003
IEF285I  SYS00222.T184451.RA000.PRDJBGL5.R0000003      KEPT
IEF285I  VOL SER NOS= WORK01.
IEF285I  SYS00222.T184351.RA000.PRDJBGL5.ZMN1         DELETED
IEF285I  VOL SER NOS= WORK01.
IEF375I  JOB /PRDJBGL5/ START 00222.1843
IEF376I  JOB /PRDJBGL5/ STOP 00222.1844 CPU OMIN 07.27SEC SRB OMIN 00.33SEC

```

The following notes relate to the lines in bold type in this sample run:

- The Restart Decision message shows that the job was restarted at STEP003.
- The CONTROLR step was added to this job. The parameters passed to the CONTROLR step are described in [Table 34](#).

Table 34 Parameters passed to CONTROLR step in sample restart

Parameter	Description
RR	Indicates a real restart, not a simulation
PRDJBGL5	Indicates the name of the control parameter member
000BU	Control-M order ID
RL	Indicates to Control-M/Restart to read all the SYSDATA of previous runs, and that the original job was not run on another node in an NJE network
.STEP005	Indicates that the job restart begins from this PGMSTEP
ACS	Indicates that abend codes and condition codes are recaptured and step adjustment is performed, if necessary

- STEP008 and STEP009 have a condition code reference to a step that was not executed in the restart. Control-M/Restart captures the condition codes from the execution history.
- Archived (compressed) SYSDATA of the previous run of the PRDJBGL5 job is dynamically allocated by the CONTROLR step. On this sample run, the name of this archived file starts with the prefix CTRSYS.JOBSDB.

- Previous runs of the PRDJBGL5 job cataloged data set PRDJBGL5.GDG.GRP07.G0031V00 in STEP004 and data set PRDJBGL5.GDG.GRP08.G0023V00 in STEP005 before abending in STEP006. These data sets were uncataloged and deleted by Control-M/Restart.
- In the current run, data set PRDJBGL5.GDG.GRP07.G0031V00 was created in STEP004 and data set PRDJBGL5.GDG.GRP08.G0023V00 was created in STEP005. The generations created in the restart have the same generation numbers as in the previous unsuccessful run.
- Execution of STEP008 and STEP009 was bypassed correctly according to the condition code from STEP002, even though STEP002 itself was not executed during the restart run.

CONTROLR step messages

Figure 9 CONTROLR step messages – Example 1

```
18.43.53 CTR001I CONTROL-M/RESTART REL 6.1.00-980B STARTED FOR JOB PRDJBGL5
18.43.53 CTR008I PROCESSING PARAMETERS: RR,PRDJBGL5,000BU,RL,.STEP005,,ACS
```

The first message above indicates that Control-M/Restart restarted the job. The second message displays the restart parameters that were passed to the CONTROLR step.

Figure 10 CONTROLR step messages – Example 2

```
EXCLUDE DSN SYS1*
EXCLUDE DSN IP01*
```

The prefixes of data sets to be excluded from File Catalog and GDG Adjustment processing (as defined in the \$DEFAULT or \$EXCLUDE members) are listed (above).

Figure 11 CONTROLR step messages – Example 3

```
* THIS SUBSECTION CONTAINS DIRECT ACCESS DEVICE DEFINITIONS *
UNITNAME SYSDA    DEVICE DASD
UNITNAME SYSALLDA DEVICE DASD
UNITNAME DISK     DEVICE DASD
UNITNAME DIRECT   DEVICE DASD
* THIS SUBSECTION CONTAINS UNIT RECORD DEVICE DEFINITIONS *
UNITNAME TAPE     DEVICE TAPE
UNITNAME TAPEC    DEVICE TAPE
UNITNAME CASSET   DEVICE TAPE
UNITNAME TAPEHI   DEVICE TAPE
UNITNAME TAPE*    DEVICE TAPE
```

The correspondence between generic unit names and device types are listed from the user-defined \$DEFAULT member.

Figure 12 CONTROLR step messages – Example 4

```

DEFAULT UNITNAME TAPE      DEVICE TAPE
DEFAULT UNITNAME TAPEHI   DEVICE TAPE
.
.
.

DEFAULT UNITNAME 3350      DEVICE DASD
DEFAULT UNITNAME 3380      DEVICE DASD
DEFAULT UNITNAME 3390      DEVICE DASD
*
*PARAMETERS SPECIFIED USING ONLINE:
*
RECAPTURE ABEND CODE=YES/NO
RECAPTURE COND CODE=YES/NO
STEP ADJUSTMENT=YES/NO
*
SUMMARY OF PARAMETERS IN EFFECT:
*
RECAPTURE ABEND CODE=YES/NO
RECAPTURE COND CODE=YES/NO
STEP ADJUSTMENT=YES/NO
*
14.37.58 CTR059I ===== ANALYZE PHASE STARTED =====
14.37.58 CTR041I DATASET WILL BE SCRATCHED FROM VOLUME "WORK01"
14.37.58 CTR042I DATASET WILL BE UNCATALOGED
14.37.58 CTR038I DSN=CTR.GEN.SAS.G0042V00 DD=SYSUT2 STEP=COPY PROCSTEP=
14.38.03 CTR060I ===== EXECUTION PHASE STARTED =====
14.38.03 CTR085I DATASET "CTR.GEN.SAS.G0042V00" SCRATCHED FROM VOL=WORK01
14.38.03 CTR090I CORRECTING REFERENCE OF GDG DATASET TO "CTR.GEN.SAS.G0041V00"
FROM:
14.38.03 CTR038I DSN=CTR.GEN.SAS.G0042V00 DD=SYSUT2 STEP=COPY PROCSTEP=
14.38.03 CTR082I RESTARTING FROM STEP COPY      .      TO STEP STEP09 .
14.38.03 CTR003I RESTART OF JOB M0500012 ENDED SUCCESSFULLY

```

Definitions of unit names are built into Control-M/Restart and need not be duplicated in either the \$DEFAULT member or the member specifically named in the PARM field.

Some Control-M/Restart messages, including those listed above, are described in [Table 35](#).

Table 35 Control-M/Restart Messages (part 1 of 2)

Message	Description
CTR059I	Control-M/Restart works in two phases. The first phase analyzes what is done.
CTR060I	The second phase actually executes the necessary adjustments (delete data sets, adjust generation numbers, and so on).
CTR147I/CTR038I	Control-M/Restart adjusts the generation number.
CTR041I/CTR042I	As part of the File Catalog and GDG Adjustment facility, the data set must be scratched and uncataloged.

Table 35 Control-M/Restart Messages (part 2 of 2)

Message	Description
CTR043E/CTR038I	A data set needed for restart does not exist. In this case the missing data set is a temporary data set that MVS deleted at the end of the previous unsuccessful run. Control-M/Restart determines a step from which restart can be successfully performed.
CTR039I	Control-M/Restart has determined that the job can be restarted from STEP003.
CTR081I	Control-M/Restart recaptured condition codes from the previous run of the job.
CTR090I/CTR038I	Control-M/Restart has corrected the generation numbers for GDG data sets.
CTR085I/CTR087I	The data set has been successfully scratched and uncataloged.
CTR082I	This message indicates the step range that the restarted job executes.
CTR003I	Control-M/Restart has completed the re-start of the job successfully. Of course, at this point the result of the execution of the restarted job is not known.

Index

Symbols

- # OF DAYS TO KEEP
 - RETENTION parameter [20, 36](#)
- # of DAYS TO KEEP
 - RETENTION parameter [33](#)
- # OF GENERATIONS TO KEEP
 - RETENTION parameter [20, 33, 36](#)
- \$ABEND
 - step value [42, 48, 51, 55](#)
- \$ABEND value
 - DO IFRERUN statement [38](#)
- \$DEFAULT member
 - CONTROL-M/Restart PARM library [21, 58, 66, 78](#)
- \$EXCLUDE member
 - CONTROL-M/Restart PARM library [21, 58](#)
 - DD Statement format [72](#)
- \$EXERR
 - step value [42, 48, 51, 55](#)
- \$EXERR value
 - DO IFRERUN statement [38](#)
- \$FIRST
 - From step value [42, 47, 51, 55](#)
- \$FIRST.\$ABEND value
 - DO IFRERUN statement [38](#)
- \$KEEP member
 - CONTROL-M/Restart PARM library [21](#)

A

- Abend code recapture [31](#)
 - CONTROL-M/Restart PARM library [65](#)
 - CONTROL-M/Restart step [65](#)
 - SYSDATA usage [27](#)
- ABNDTYP parameter
 - CTRPARM member [64](#)
- ACTION REQUIRED parameter
 - Simulation panel [46](#)
 - Standalone panel [41](#)
- action required parameters
 - Simulation panel [46](#)
- Active Environment screen [22, 36](#)
 - actions [38](#)
- all runs of a job [31](#)
- AMPREFR parameter
 - CTRPARM member [80](#)

- AMUNIT parameter
 - CTRPARM member [80](#)
- AMVOL parameter
 - CTRPARM member [80](#)
- AUTO-ARCHIVE parameter [81](#)
 - job scheduling definition [20, 36](#)
 - SYSDATA [27](#)
- AutoEdit parameter
 - Standalone panel [42](#)
- AutoEdit parameters
 - Dataset Cleanup panel [51](#)
 - Job Dataset List panel [54](#)
 - Simulation panel [47](#)
 - Standalone panel [42](#)
- AutoEdit resolution
 - Dataset Cleanup panel [51](#)
 - Job Dataset List panel [55](#)
 - Simulation panel [48](#)
- Auto-Edit variables
 - restart [25](#)
- AutoEdit variables
 - DO SET statement [37](#)
 - JCL library mode [45, 49, 53](#)
 - scheduling library mode [46, 49, 53](#)
 - SET VAR statement [37](#)
- Automatic file catalog adjustment [28](#)
- Automatic rerun
 - DO RERUN statement [37](#)
- Automatic restart step adjustment
 - definition [30](#)

B

- Backward-referenced step
 - IF/THEN/ELSE JCL block [77](#)
- BETA91 interface [82](#)
- BMC Software, contacting [2](#)

C

- Catalog
 - access [76](#)
- Catalog adjustment [28](#)
- CDAMSNAP DD statement

- SYSDATA error messages 60
- CHKSEC parameter 66
 - CONTROL-M/Restart PARM library 66
 - CTRPARM member 66
- Cleanup operation
 - CONTROLR step 62
- Cleanup parameters
 - Dataset Cleanup panel 50
- CLIST
 - CTMJDSN Job Dataset List panel 52
 - CTRCLN dataset cleanup panel 48
 - CTRCSIM Simulation panel 44
- CLIST CTRCCTR
 - CONTROL-M/Restart Standalone panel 39
- CLIST IOAUTIL 43
- COND JCL parameter 31
- COND parameter
 - backward-referenced step 77
- Condition code
 - step 66
- Condition code recapture 31
 - CONTROL-M/Restart PARM library 65
 - CONTROLR step 65
 - SYSDATA usage 27
- CONFIRM parameter
 - DO IFRERUN statement 36
- Confirm Restart Window
 - recapture condition / abend codes 31
- Confirm Restart window
 - Active Environment screen 22, 37
 - step adjustment 30
- control parameters
 - CONTROL-M/Restart PARM library 66
- CONTROL-M
 - Status screen 37
- CONTROL-M monitor
 - CONTROL-M/Restart logic 21
- CONTROL-M Statistics file
 - Job Dataset list 52
- CONTROL-M/Analyzer Interface 82
- CONTROL-M/Restart dataset cleanup 48
- CONTROL-M/Restart Job Dataset List utility 52
- CONTROL-M/Restart online utilities 43
- CONTROL-M/Restart PARM library 21, 58
 - abend code recapture 65
 - condition code recapture 65
 - NONRESTARTABLE_STEP parameter 31
 - parameters 66
 - step adjustment 65
- CONTROL-M/Restart processing
 - AutoEdit resolution 42
- CONTROL-M/Restart simulation 43
 - AutoEdit resolution 48
- CONTROL-M/Restart Standalone 32
- CONTROL-M/Restart standalone
 - online utility R4 23
- CONTROL-M/Restart Standalone panel
 - dataset cleanup 32
- CONTROLR Step 58
 - JCL 59
- CONTROLR step 21, 26
 - messages 90
 - simulation utility 44
 - SYSDATA usage 27
- Conventions Used in This Guide 12
- CPUs
 - multiple CPU environment 76
- CTMCAJF utility
 - archived SYSDATA deletion 81
- CTMJDSN utility
 - Job Dataset List panel 52
- CTMPARM member 58
- CTMSE02 exit
 - CONTROLR step 62
- CTMX002 exit
 - CONTROLR step 62
- CTR001I message
 - CONTROLR step 90
- CTR003I message
 - CONTROLR step 92
- CTR008I message
 - CONTROLR step 90
- CTR038I message
 - CONTROLR step 91, 92
- CTR039I message
 - CONTROLR step 92
 - Step Adjustment 70
- CTR041I message
 - CONTROLR step 91
- CTR042I message
 - CONTROLR step 91
- CTR043E message
 - CONTROLR step 92
- CTR059I message
 - CONTROLR step 91
- CTR060I message
 - CONTROLR step 91
- CTR081I message
 - CONTROLR step 92
- CTR082I message
 - CONTROLR step 92
- CTR085I message
 - CONTROLR step 92
- CTR087I message
 - CONTROLR step 92
- CTR090I message
 - CONTROLR step 92
- CTR147I message
 - CONTROLR step 91
- CTR183I message
 - step adjustment 70
- CTR184S message
 - step adjustment 70
- CTRCLN utility

- Dataset Cleanup panel [48](#)
- CTRCCTR
 - Standalone CONTROL-M/Restart [32](#)
- CTRCCTR utility
 - CONTROL-M/Restart Standalone panel [39](#)
- CTRCSIM utility
 - Simulation panel [44](#)
- CTRNORST DD statement [69](#)
 - non-restartable step [30](#), [80](#)
- CTRPARM member [58](#)
 - ABNDTYP parameter [64](#)
 - AMPREFR parameter [80](#)
 - AMUNIT parameter [80](#)
 - AMVOL parameter [80](#)
 - CHKSEC parameter [66](#)
 - CTRPROC parameter [62](#)
 - dataset cleanup [32](#)
 - IFADJ parameter [77](#)
 - IOA PARM library [21](#)
 - MSGLVL parameter [68](#)
 - NCAT2 parameter [32](#), [61](#)
 - NFILVS9 parameter [82](#)
 - SEARCH parameter [76](#)
 - step adjustment [30](#)
 - TAPEMS parameter [81](#)
- CTRPROC parameter
 - CTRPARM member [62](#)
- CTRX001
 - exit [82](#)
- CTRX001B
 - exit [82](#)
- CTRX001D
 - exit [82](#)
- CTRX001H
 - exit [82](#)
- CTRX001Q
 - exit [82](#)
- CTRX001T
 - exit [82](#)
- CTRX001Z
 - exit [82](#)
- customer support [3](#)
- cyclic task
 - no SYSDATA usage [27](#)

D

- DAARCH DD
 - SYSDATA [76](#)
- DAARCH DD statement
 - SYSDATA location [60](#)
- DACTRCTL DD statement [66](#)
 - control parameter members [60](#)
- DALIST DD statement
 - dataset cross-reference [61](#)
- DASTAT DD statement

- CONTROL-M Statistics file [61](#)
- Dataset Cleanup [19](#), [28](#)
 - CONTROL-M/Restart Standalone [40](#)
 - CONTROLR Step [61](#)
 - Online Utility R2 [23](#)
 - Prior to Original Run [32](#)
- dataset cleanup
 - AutoEdit resolution [51](#)
- Dataset Cleanup Utility [48](#)
- Dataset Cross-reference List
 - DALIST DD statement [61](#)
- Dataset List Utility [52](#)
- DATRACE DD statement
 - debugging messages [60](#)
- DD Statement
 - \$EXCLUDE parameter member [72](#)
 - CTRNORST [80](#)
 - UCC11NR [80](#)
- DD statement
 - CDAMSNAP [60](#)
 - CONTROLR step [60](#)
 - CTRNORST [69](#)
 - DAARCH [60](#)
 - DACTRCTL [60](#), [66](#)
 - DALIST [61](#)
 - DASTAT [61](#)
 - DATRACE [60](#)
 - SYSPRINT [60](#)
- DD statements
 - \$DEFAULT member [58](#)
- debugging
 - DATRACE DD statement [60](#)
- device type
 - UNITNAME parameter [71](#)
- DMS/OS interface [82](#)
- DO IFRERUN parameter
 - job scheduling definition [20](#)
- DO IFRERUN statement [25](#)
 - job scheduling definition [36](#)
- DO RERUN statement
 - automatic rerun [37](#)
- DO SET parameter
 - restart [25](#)
- DO SET statement
 - AutoEdit variables [37](#)
- DO statement
 - restart [24](#)
- DUPLICATE DATASET error
 - dataset cleanup [61](#)
- duplicate dataset prevention [28](#)
- dynamic allocation
 - considerations [29](#)
 - NFILVS99 parameter [83](#)

E

ENTER YES TO CONTINUE
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [54](#)
 Simulation panel [47](#)
 Standalone panel [42](#)

error handling
 restart step adjustment [26](#)

Esoteric Unit Name
 UNITNAME Parameter [78](#)

esoteric unit name
 UNITNAME parameter [71](#)

exclude datasets from cleanup [67](#)

EXCLUDE DSN parameter
 CONTROL-M/Restart PARM library [67](#)

EXCLUDE DSN Statement
 Description [67](#)

EXCLUDE DSN statement
 CONTROL-M/Restart processing [61](#)

EXCLUDE DSN statements
 \$DEFAULT member [79](#)

excluding DD statements
 \$EXCLUDE member [72](#)

EXEC statement
 CONTROLR step [61](#)

exit
 CTMSE02 [62](#)
 CTMX002 [62](#)
 CTRX001 [82](#)
 CTRX001B [82](#)
 CTRX001D [82](#)
 CTRX001H [82](#)
 CTRX001Q [82](#)
 CTRX001T [82](#)
 CTRX001Z [82](#)

F

file catalog adjustment [28](#)
 SYSDATA usage [27](#)

file exclusion
 EXCLUDE DSN statement [79](#)

filtering window
 Active Environment screen [38](#)

FIRST RESTART field
 multiple restarts [43](#)

FIRST RESTART parameter
 Standalone panel [41](#)

FROM PGMSTEP parameter
 Dataset Cleanup panel [50](#)
 Simulation panel [47](#)
 Standalone panel [41](#)

FROM PROCSTEP parameter
 Dataset Cleanup panel [51](#)
 Simulation panel [47](#)

Standalone panel [41](#)

FROM STEP parameter
 CONTROLR step [64](#)

FROM step parameter
 DO IFRERUN statement [36](#)

From Step values
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [55](#)

From step values [42](#)
 Simulation panel [47](#)

G

GDG Adjustment [28](#)

GDG adjustment [28](#), [77](#)
 SYSDATA usage [27](#)

GDG bias numbers [29](#)

GDG datasets
 dynamic allocation [29](#)

general parameters
 Dataset Cleanup panel [50](#)
 Standalone panel [40](#)

generation dataset
 considerations [77](#)

Generation Dataset (GDG) Adjustment [28](#)

generation dataset adjustment [28](#)

generation number [77](#)

GLOBAL AUTOEDIT LIBRARY
 Simulation panel [47](#)

GLOBAL AUTOEDIT LIBRARY parameter
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [54](#)

GLOBAL parameter
 Standalone panel [42](#)

H

helping CONTROL-M/Restart [79](#)

History Environment screen [22](#), [38](#)

History Jobs file [19](#), [33](#), [81](#)

HSM interface [82](#)

I

IDCAMS IBM utility interface [82](#)

IEF285I message
 dataset name substitution [78](#)

IF/THEN/ELSE JCL blocks [77](#)

IF/THEN/ELSE JCL statements [31](#)

IFADJ parameter
 CTRPARM member [77](#)

IOA online utilities [23](#)

J

- JCL
 - CONTROLR Step [59](#)
 - Helping [79](#)
 - preparing for submission [25](#)
 - submission [26](#)
- JCL editing [38](#)
- JCL Library mode
 - Job Dataset List utility [53](#)
- JCL library mode
 - dataset cleanup utility [49](#)
 - simulation utility [45](#)
- JCL library mode parameters
 - Dataset Cleanup panel [50](#)
 - Job Dataset List panel [54](#)
 - Simulation panel [46](#)
- JCL LIBRARY parameter
 - Dataset Cleanup panel [50](#)
 - Job Dataset List panel [54](#)
 - Simulation panel [46](#)
 - Standalone panel [41](#)
- job
 - preparing JCL for submission [25](#)
 - selection for restart [25](#)
- Job Dataset list
 - online utility R3 [23](#)
- Job Dataset List panel
 - AutoEdit resolution [55](#)
- Job Dataset List utility [52](#)
- JOB NAME parameter
 - Dataset Cleanup panel [50](#)
 - Job Dataset List panel [54](#)
 - Simulation panel [47](#)
- Job Order Execution History screen [22, 27, 37](#)
- job rerun
 - definition [18](#)
- job restart
 - definition [18](#)
 - DO IFRERUN parameter [20](#)
- job run
 - maintaining previous runs [19](#)
- job runs
 - maintaining previous runs [33](#)
 - using all runs [31](#)
- job scheduling definition [58](#)
 - restart parameters [24](#)
- Job Scheduling Definition screen [36](#)
 - CONTROL-M [20](#)
 - parameters [36](#)
- job sysout
 - SYSDATA [27](#)
- JOBCAT JCL statement [77](#)
- JOBID field
 - multiple restarts [43](#)
- JOBID parameter
 - Standalone panel [41](#)

- JOBNAME parameter
 - Standalone panel [41](#)

L

- Last Night Restart History report [23](#)
- Last Night Sysout Scan Summary report [24](#)
- local member
 - CONTROL-M/Restart PARM library [21, 58, 66](#)
- local node
 - SYSDATA source [64](#)
- Log file
 - viewing [39](#)
- logic
 - CONTROL-M monitor [21](#)

M

- manual confirmation
 - job scheduling definition [36](#)
- manual intervention
 - CONTROL-M/Restart processing [20](#)
- Manual Restart Confirmation report [23](#)
- Masking
 - EXCLUDE DSN [67](#)
- MAXDAYS subparameter
 - AUTO-ARCHIVE parameter [81](#)
- MAXRERUN statement [37](#)
- MAXRUNS subparameter
 - AUTO-ARCHIVE parameter [81](#)
- MEM parameter
 - CONTROLR step [63](#)
- MEMBER NAME parameter
 - Dataset Cleanup panel [50](#)
 - Job Dataset List panel [54](#)
 - Simulation panel [46](#)
- MEMBER parameter
 - Standalone panel [41](#)
- MEMNAME field
 - Zoom screen [63](#)
- Messages
 - Logging Level [68](#)
- messages
 - CONTROLR step [90](#)
- MODE parameter
 - CONTROLR step [62](#)
- MSGLVL parameter
 - CTRPARM member [68](#)
- MSGLVL_FULL Parameter
 - Message Level [68](#)
- MSGLVL_FULL parameter
 - CONTROL-M/Restart PARM library [68](#)
- MSGLVL_STD parameter
 - CONTROL-M/Restart PARM library [68](#)
- multi-CPU environment

running CONTROL-M/Restart [76](#)
 multiple restarts
 Standalone panel [43](#)

N

NAME field
 Active Environment screen [63](#)
 NCAT2 parameter
 CTRPARM member [32, 61](#)
 New Day procedure
 deleting archived SYSDATA [81](#)
 NFILVS9 parameter
 CTRPARM member [82](#)
 NFILVS99 parameter
 dynamic allocation [83](#)
 NJE indicator
 CONTROLR step [64](#)
 NJE job
 DAARCH and SYSDATA [60](#)
 restart [61](#)
 abend code recapture
 [69](#)
 automatic step adjustment
 [70](#)
 condition code recapture
 [69](#)
 CONTROL-M/Restart PARM library
 [31](#)
 CTRPARM member
 [30](#)
 RECAPTCC / [31](#)
 security check
 [66](#)
 step adjustment
 [70](#)
 NO RECAPTABEND parameter [31](#)
 NOCHKSEC parameter
 CONTROL-M/Restart PARM library [66](#)
 NON_RESTARTABLE_STEP parameter
 CONTROL-M/Restart PARM library [69](#)
 non-CONTROL-M job
 dataset cleanup [32](#)
 non-restartable step
 definition [30](#)
 NONRESTARTABLE_STEP parameter [31](#)
 NORECAPTABEND parameter
 CONTROL-M/Restart PARM library [69](#)
 NORECAPTCC parameter [31](#)
 CONTROL-M/Restart PARM library [69](#)
 NOSTEPADJUST parameter [30](#)
 CONTROL-M/Restart PARM library [70](#)
 NOT CATLGD 2 error
 dataset cleanup [61](#)
 NOT CATLGD2 error prevention [28](#)

O

ODATE parameter
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [54](#)
 Simulation panel [47](#)
 Standalone panel [42](#)
 ON statement
 restart [24](#)
 online utilities [23, 43](#)
 online utility
 dataset cleanup [32](#)
 R1 - Simulation [23](#)
 R2 - Dataset Cleanup [23](#)
 R3 - Job Dataset List [23](#)
 R4 - CONTROL-M/Restart Standalone panel [23](#)
 OPERATION MODE parameter
 dataset cleanup panel [50](#)
 Simulation panel [46](#)
 OPERATION parameter
 CONTROLR step [62](#)
 Option 5
 IOA Primary Option menu [39](#)
 option 6
 IOA Primary Option menu [43](#)
 Online Utility menu [39](#)
 Option L
 Active Environment screen [39](#)
 options
 Status screen [37](#)
 ORDER ID parameter
 Dataset Cleanup panel [50](#)
 Simulation panel [47](#)
 ORDERID [26](#)
 ORDERID parameter
 CONTROLR step [63](#)
 OWNER parameter
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [54](#)
 Simulation panel [47](#)
 Standalone panel [42](#)

P

parameter members
 CONTROL-M/Restart [21](#)
 parameter passing
 CONTROLR step [61](#)
 parameters
 CONTROL-M/Restart PARM library [66](#)
 job scheduling definition [20](#)
 PARM operand
 job restart [61](#)
 PARM parameter
 CONTROLR step [61](#)
 pgmstep

- CONTROLR step 64
- pgmstep conditions code 66
- Prefixing
 - EXCLUDE DSN 67
- preparing JCL for submission 25
- prevent NOT CATLGD2 errors 28
- PREVENT-NCT2
 - CONTROL-M/Restart Standalone 40
- Prevent-NCT2 operation
 - CONTROLR step 62
- PREVENT-NCT2 parameter
 - job scheduling definition 20, 32, 36
- PREVENT-NCT2 processing
 - simulation utility 45
- prevent-NCT2 processing 19, 28, 32
- previous job runs
 - History Jobs file 33
- procstep
 - CONTROLR step 64
- procstep condition code 66
- product support 3

R

- R1
 - simulation online utility 23
- R1 option
 - IOA Online Utilities menu 44
- R2
 - dataset cleanup online utility 23
- R2 online utility 32
- R2 option
 - IOA Online Utilities menu 48
- R3
 - Job Dataset list online utility 23
- R3 option
 - IOA Online Utilities menu 52
- R4
 - CONTROL-M/Restart standalone online utility 23
- R4 utility
 - standalone CONTROL-M/Restart 32
- reading SYSDATA
 - CONTROLR step 64
- real mode
 - CONTROLR step 62
- RECAPT/ADJUST parameter
 - CONTROLR step 65
- RECAPTABEND 31
- RECAPTABEND parameter 31, 69
 - CONTROL-M/Restart PARM library 69
- RECAPTCC parameter 31, 69
 - CONTROL-M/Restart PARM library 69
- recoverable job step
 - definition 29
- remote node
 - SYSDATA Source 64

- rerun
 - definition 18
- Rerun Restart window
 - Active Environment screen 22, 37
- RERUNMEM statement 37
- restart 18
 - definition 18
 - following system crash 76
 - job scheduling definition parameters 24
 - process overview 25
 - simulation utility 45
 - standalone 39
 - tracking and control 26
 - under CONTROL-M 24
- restart confirmation
 - Active Environment screen 38
- Restart Detail report 23
- restart execution
 - example 83
- restart operation
 - CONTROLR step 62
- Restart parameters
 - Standalone panel 41
- restart parameters
 - Simulation panel 47
 - Standalone panel 41
- restart step adjustment
 - definition 30
 - error handling 26
 - SYSDATA usage 27
- Restart Step List window
 - Active Environment screen 22, 37
- Restart Time Savings report 24
- Restart window
 - Active Environment screen 22
- restarts
 - CONTROLR step 61
- RETENTION parameter
 - # OF DAYS TO KEEP 36
 - # OF GENERATIONS TO KEEP 36
 - job scheduling definition 20, 33
- RETENTION parameters 81

S

- sample restart execution 83
- SCHEDULE LIBRARY parameter
 - Simulation panel 47
- scheduling library mode
 - dataset cleanup utility 49
 - Job Dataset List utility 53
 - simulation utility 46
- scheduling library mode parameters
 - Dataset Cleanup panel 50
 - Job Dataset List panel 54
 - Simulation panel 47

SCHEDULING LIBRARY parameter
 Dataset Cleanup panel [50](#)
 Job Dataset List panel [54](#)
 scratching uncataloged datasets [78](#)
 screen [3](#) [22](#)
 screens
 CONTROL-M/Restart dataset cleanup [48](#)
 CONTROL-M/Restart Job Dataset List [52](#)
 CONTROL-M/Restart simulation [43](#)
 CONTROL-M/Restart Standalone [39](#)
 SEARCH parameter
 CTRPARM member [76](#)
 selecting a job for restart [25](#)
 SET VAR parameter
 restart [25](#)
 SET VAR statement
 AutoEdit variables [37](#)
 Show Screen Filter window [38](#)
 simulation
 online utility R1 [23](#)
 simulation mode
 CONTROLR step [62](#)
 simulation utility [43](#)
 space requirements
 SYSDATA archiving [80](#)
 Standalone CONTROL-M/Restart [32](#)
 Online Utility R4 [23](#)
 standalone CONTROL-M/Restart [39](#)
 Standalone panel
 General parameters [40](#)
 Statistics file
 DASTAT DD statement [61](#)
 Job Dataset list [52](#)
 Status screen
 options [37](#)
 step adjustment [30](#)
 CONTROL-M/Restart PARM library [65](#)
 CONTROLR step [65](#)
 non-restartable step [69](#)
 STEP CODE parameter
 CONTROLR step [66](#)
 step conditions code
 CONTROLR step [66](#)
 STEPADJUST parameter [30](#), [70](#)
 CONTROL-M/Restart PARM library [70](#)
 STEPCAT JCL statement [77](#)
 support, customer [3](#)
 SYSDATA [27](#)
 DAARCH DD [76](#)
 dataset cleanup [28](#)
 deleting archived SYSDATA [81](#)
 viewing [38](#)
 SYSDATA archiving
 job scheduling definition [20](#), [36](#)
 space requirement [80](#)
 SYSDATA read indicator
 CONTROLR step [64](#)

SYSDATE
 Order ID [63](#)
 SYSDB subparameter
 SYSDATA Archiving [80](#)
 SYSOPT parameter
 CONTROLR step [64](#)
 SYSOUT parameter
 CONTROLR step [64](#)
 Sysout Viewing screen [22](#), [27](#), [38](#)
 SYSPRINT DD statement [60](#)
 system crash
 restart [76](#)

T

TABLE NAME parameter
 Dataset Cleanup panel [50](#)
 Job Dataset List panel [54](#)
 Simulation panel [47](#)
 tape management system [81](#)
 tape volume reuse [81](#)
 TAPEMS parameter
 CTRPARM member [81](#)
 technical support [3](#)
 TO PGMSTEP parameter
 Dataset Cleanup panel [50](#)
 Simulation panel [47](#)
 Standalone panel [41](#)
 TO PROCSTEP parameter
 Dataset Cleanup panel [51](#)
 Simulation panel [47](#)
 Standalone panel [41](#)
 TO STEP Field
 PARM Parameter [65](#)
 TO step parameter
 DO IFRERUN statement [36](#)
 To Step values
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [55](#)
 To step values [42](#)
 Simulation panel [47](#)
 trace level
 TRCREST/TRCNCT2 parameters [70](#)
 TRACE MODE parameter
 dataset cleanup panel [50](#)
 Job Dataset List panel [54](#)
 Simulation panel [46](#)
 Standalone panel [41](#)
 TRACE parameter
 CONTROLR step [65](#)
 tracing levels [65](#)
 tracking and control
 restarted jobs [26](#)
 TRCNCT2 parameter
 CONTROL-M/Restart PARM library [70](#)
 TRCREST parameter

CONTROL-M/Restart PARM library [70](#)
 TSO Command processor [43](#)
 TYPE parameter
 CONTROLR step [62](#)

U

UCC11NR DD Statement
 CA-11 Conversion [80](#)
 UNITNAME definition
 \$DEFAULT member [78](#)
 UNITNAME parameter
 CONTROL-M/Restart PARM library [71](#)
 using all runs of a job [31](#)
 Utility
 CTMCAJF [81](#)
 utility
 CTMJDSN Job Dataset list [52](#)
 CTRCLN dataset cleanup [48](#)
 CTRCTR Standalone CONTROL-M/Restart [39](#)
 CTRCSIM Simulation [43](#)

V

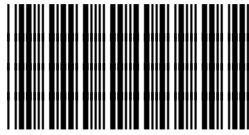
VOL parameter [78](#)
 VTOC maintenance
 CONTROL-M/Restart step [28](#)

W

WAIT CONFIRMATION status
 Active Environment screen [38](#)
 WAIT SCHEDULE status [25](#)
 WDATE parameter
 Dataset Cleanup panel [51](#)
 Job Dataset List panel [54](#)
 Simulation panel [47](#)
 Standalone panel [42](#)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Notes



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