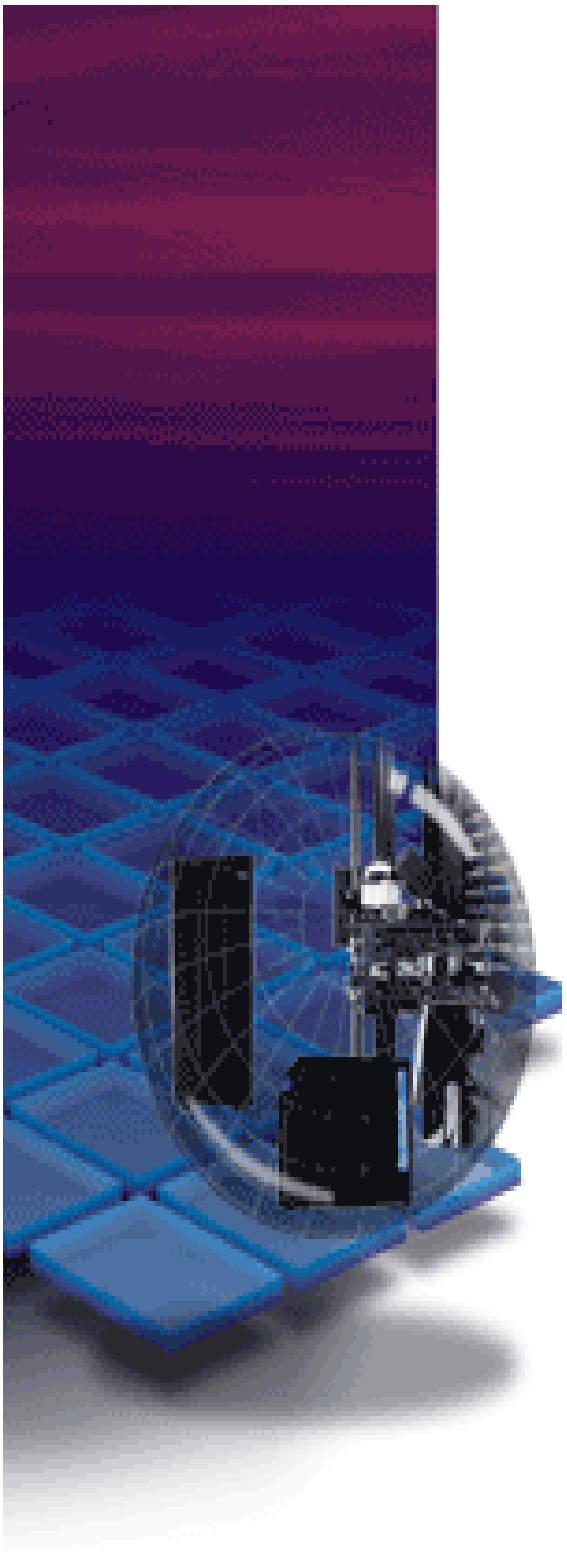

Tape/Copy

User Guide

Release 2.7.4

OpenTech SYSTEMS, INC.

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1 About This Guide

TOPICS COVERED IN THIS CHAPTER

Documentation Amendment History (page 1-2)
Software Documentation Library (page 1-4)
Customer Service (page 1-4)
Problem Reporting Information (page 1-4)
Cautionary and Notable Items (page 1-5)
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Reference Guide Chapter Summaries (page 1-5)

Introduction

This guide describes the Tape/Copy product, its features, functions and various uses.

Documentation Amendment History

This section lists any notable amendments to the Tape/Copy User Guide.

Date	Revision Description
November 2002	Removed parameters, message codes and VDR information from the Tape/Copy Product Reference Guide and added several chapters to create new Tape/Copy User Guide.
March 2003	Added “Recycling Stacked Tapes with Tape/Copy” chapter. Updated selection panel descriptions to include support of STACKED-FILE-QUALIFICATION: EACH.
January 2004	Added “Tape Analysis & Compare Utility” chapter. Updated the SYSOUT DD appendix. Updated Tape Pre-Pull List Reports. Added pre-filtering by Dataset Name/Creation Job to “Candidate Selection” chapter and to the ISPF job parameters panels. Added INCLDSCJ, EXCLDSCJ, PGMSETS members to PARMLIB appendix. Updated FAQ appendix. Updated “Implementation Considerations” chapter. Updated “Conversion Job Performance” chapter. Updated proprietary information to include Mobius Infopac and DFSMShsm formats. Added VTAR Interface to Conversion Job Parameters panels. Added Include/Exclude Filter Tables Report. Added TAPANLYZ, TAPCOMPR and UPFRM25X members to the JCLLIB appendix.
May 2004	Added Control-T R6.1 considerations. Added Disaster Recovery Site Considerations. Updated the screen example for the Moved Volume Set Options.
June 2005	Added DMS/CA-Disk Update Report. Added separate chapter for proprietary dataset processing considerations. Added new PARMLIB members COPYRULE, DBSBRINC, DISKALOC, DISKRULE. Added new JCLLIB members DCVPCCA1 (replaces DCVLTCVT), DCVPCTLM, DCVPCRMM, VDRA123. Added exclusion of previously selected datasets. Added new chapters for Tape Compare and Analysis ISPF options. Added new chapter for output file reblocking.
November 2005	Added chapter for the new CopyCrypt feature. Added information on BVIR. Added information on erasing the end of data on output tapes. New PARMLIB members: BVIRBASE and CRYPTRUL. New JCLLIB member BLDBVIRD. Added Peer-to-Peer Synchronization Candidate Report. Added Output File Encryption: field to the Conversion Job Parameters panel.
February 2006	Added CopyCrypt options field to Copy on Demand ISPF panel. Added CNVABEND member of the PARMLIB. Changed the DDname for the Stack Management Clean-up Expiration Report from EXPIRERP to EXPSTKRP. BVIR interface now tracks/checks the dump date to ensure the BVIR is current. Added additional security/RACF information to CopyCrypt considerations. Added new password option to encryption specification.
July 2006	Added STK specific information for BVIR feature.

Date	Revision Description
October 2007	Removed CopyCrypt chapter to create separate CopyCrypt Guide. Added RACF authorization checking feature; added RACF Auth Checking fields to job parameters panels. Supports copying datasets with no record format in the TMC. Added ability to adjust calculated dataset size based on compression. Added Decompression Rules Table Report. Added Tape Browse feature and ISPF interface. Support for recovery overwritten tapes. Added Recover Overwritten Tapes Report. Support for setting non-zero return code in Candidate Selection jobs that select no candidates. New JCLLIB members: BVIRBLDS, TCRECOVR, DCVPCZAR, VDRA124, KEYDBBK, KEYDBCMP, KEYDBINI, KEYDBMAS, KEYDBMS1, KEYDBRAN, KEYDBRST, KEYDBUPD, and KEYDBVAL. New PARMLIB member: UNCMPRUL.
September 2008	Combined and renamed chapter 24 (Recover Overwritten Files), chapter 34 (Tape Browse), chapter 35 (Tape Erase), and chapter 36 (Tape Certify and Label) to Chapter 33, Library Management Utilities. Renamed Erase Tape job to Tape Security Erase. Changed ERASEJCL to LMERASE. Changed CERTJCL member to LMCERTFY. Added LMCERTFY and LMERASE members. Changed TCRECOVR member to LMRECOVR. Added the panel option "7 Recycle Stacked". Renamed the panel option "7 Tape Browse" to "LM Tape Browse". Renamed the panel option "8 VDR Options" to "V VDR Opions". Renamed the panel option "9 Key DB Maint" to "CC Key DB Maint".
November 2008	Removed EDITRTNS and FACTSETS members.
July 2009	Added a sample of the report produced by the Enhanced Stack Cleanup process for TLMS. Added Stacking Groups section.
October 2009	Added the TAPENAME PARMLIB Library member. Added the ability to add additional files to an existing VDR Backup volume set.
April 2010	Added support for OAM Object Storage and Backup tapes. Added PARMLIB member ISPFFACT. Added Tape/Copy JCLLIB library member RMMPENDI. TapeCopy now has the ability to resume a MOVE or COPY conversion job to a stacked tape after the original conversion has been interrupted. For additional information, refer to Restart Management (page 18-10) . Removed the DBSBRINC member from the Tape/Copy PARMLIB library.
January 2012	Added support for the default entry for PROPRIET member of the Tape/Copy PARMLIB to identify Generic EDM datasets. Added PARMLIB members FACTSETS, DSNALLOC, and OTMSGID. Added JCLLIB Library members OAMUPDAT, PRESTKCF, RESTARTU, and TCERASET.

Software Documentation Library

This documentation can also be found online on the OpenTech Systems Technical Support web site (http://www.opentechsystems.com/support.php). Registration is required to access the web site.

All documents in the OpenTech Systems Software Documentation Library are in PDF format and can be read using Adobe Acrobat Reader. Acrobat Reader can be downloaded free at:

http://www.adobe.com/acrobat.

Customer Service

OpenTech Systems' Technical Support can be reached:

- By Phone: 469-635-1500
- By Fax: 469-635-1507
- By Email: support@opentechsystems.com

Normal business hours are Monday through Friday from 8:30 a.m. to 5:00 p.m., Central Standard Time. However, user assistance is available 24 hours a day, 7 days a week.

After hours support can be reached by calling 469-635-1500 and leaving a message. When leaving a message, specify whether your support request is urgent. If it is urgent, a Technical Support representative will contact you immediately. If it is not urgent, you will be contacted the following business day.

International customers should contact their local distributor in the event that they encounter problems with an OpenTech Systems product.

Problem Reporting Information

In order for Technical Support to research any problems you may have with Tape/Copy, please have the following information available:

- Tape/Copy release, version and PTF level (if applicable)
- Tape management system name and release/version level
- OS/390 or z/OS release number
- JCL that was submitted
- Job output and dump, if generated
- Any error message codes
- Any other information you think may be important to understanding the problem

Cautionary and Notable Items

The alert statements—**Note**, **Caution**, and **Warning**—are formatted in the following styles:

Note This symbol appears in the margin next to items that should be given special consideration. Understand these items completely before continuing with the installation and customization process.

Caution Advises of important information, such machine or data error that could occur should the user fail to take or avoid a specified action.

Warning This symbol appears next to items that offer information about the use of this software or that describe differences between this and previous releases.

JCL Example Conventions

This guide and the Tape/Copy JCL libraries may contain JCL and control statement examples. Please keep in mind that these examples may not be appropriate for every environment. Most of these examples will require some modification before they will function properly in your specific environment.

The fields that require modification are noted with the characters '<===' near the right margin. There may be other fields in the examples that require modification before use. In particular, most of the dataset names in the JCL examples will need to be changed before you can use these examples in your data center.

Reference Guide Chapter Summaries

The Tape/Copy User Guide consists of the following chapters:

Chapter 1, "About This Guide" – This provides an amendment history of the manual, customer service contact information and problem reporting tips.

Chapter 2, "Introduction to Tape/Copy" – This section provides an overview of the Tape/Copy product.

Chapter 3, "Improving Tape Operations with Tape/Copy" – This section offers information on some of the various ways that Tape/Copy can be used.

Chapter 4, "Implementation Considerations" – This section provides information on things user's should be aware of before using the Tape/Copy product in their environment.

Chapter 5, "Processing Proprietary Data Formats" – This section provides information on using Tape/Copy to process data formats such as DFSMShsm, DMS, FDR, etc. Also includes any restrictions when processing these data formats.

Chapter 6, “Tape/Copy Housekeeping” – This section provides information on maintaining the Tape/Copy product and its features.

Chapter 7, “Audit Features and Statistics” – This section explains the Audit Log file and the Statistics file that Tape/Copy uses to keep track of its conversions.

Chapter 8, “Parameter Hierarchy” – This section provides an explanation of how Tape/Copy uses the parameters found in the USERSETS members in the Tape/Copy PARMLIB, along with the values specified by the user on the ISPF panels.

Chapter 9, “Candidate Selection” – This section provides information on the process used by Tape/Copy to select tape datasets for conversion. The reports generated by this process are also listed.

Chapter 10, “Adjust Calculated Dataset Sizes” – This section provides information about changing the calculated dataset size during Candidate Selection.

Chapter 11, “Calculated Expiration Dates” – This section explains how Tape/Copy can be used to calculated the expected expiration date of tape datasets.

Chapter 12, “Tape/Copy Conversion Process” – This section explains the conversion process used by Tape/Copy and how conversion failures are handled.

Chapter 13, “Conversion Job Performance” – This section provides information on how to configure the Tape/Copy EXCP copy engine for maximum performance in your environment.

Chapter 14, “Conversion Job Triggering” – This section explains how to use the Conversion Job Triggering feature of Tape/Copy.

Chapter 15, “Console Command Interface” – This section provides information on how to halt a Tape/Copy conversion job while processing (rather than canceling the job).

Chapter 16, “Output File Reblocking” – This section provides information on using Tape/Copy to reblock dataset as part of the conversion process.

Chapter 17, “Handling Bad Blocks” – This section provides information on how Tape/Copy’s EXCP copy engine handles bad blocks.

Chapter 18, “Stacking Tapes with Tape/Copy” – This section explains how Tape/Copy can be used to stack tape datasets.

Chapter 19, “Stack Management Control” – This section explains how Tape/Copy can optionally place a control file as the first file on the stacked tape to prevent premature expiration by the tape management system.

Chapter 20, “Stacking Conflict Avoidance” – This section explains how SMF data can be used to determine which datasets may normally be used at the same time, and avoid stacking those datasets together.

Chapter 21, “Co-Location Facility” – This section explains how to define and use a Co-Location table to tell Tape/Copy which datasets should be stacked together on the stacked output tapes.

Chapter 22, “Recyling Stacked Tapes” – This section explains how to Tape/Copy can be used to select only certain datasets on a stacked tape and copy them to new media.

Chapter 23, “Unstacking or Extracting Tape Datasets” – This section explains how Tape/Copy can be used to unstack or extract datasets from a stacked tape.

Chapter 24, “Tape Analysis & Compare Utility” – This section provides information on the use of Tape/Copy’s tape analysis and compare tool.

Chapter 25, “Tape/Copy ISPF Processing” – This section explains how to invoke and navigate Tape/Copy’s ISPF panels.

Chapter 26, “PARMLIB Panel Option” – This section explains the use of the PARMLIB option of the Tape/Copy Primary Selection panel.

Chapter 27, “Mass Copy Panel Option” – This section explains the use of the Mass Copy option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed.

Chapter 28, “Copy On Demand Panel Option” – This section explains the use of the Copy on Demand option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed.

Chapter 29, “ACS Copy Panel Option” – This section explains the use of the ACS Copy option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed.

Chapter 30, “Audit Log Report Panel Option” – This section explains the use of the Audit Log Report Panel option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed.

Chapter 31, “Tape Analysis Panel Option” – This section explains the use of the Tape Analysis Panel option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed.

Chapter 32, “Tape Compare Panel Option” – This section explains the use of the Tape Compare Panel option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed.

Chapter 34, “Library Management Utilities” – This section explains the use of the Tape Browse Panel option of the Tape/Copy Primary Selection panel. Each of the fields and panels accessed through this menu option are listed. This section also explains the use of Tape/Copy’s utility for recovering datasets that have been overwritten.

Appendix A, “Wildcard Characters” – This section provides a list of the valid wildcarding (or dataset masking) characters used by Tape/Copy.

Appendix B, “JCLLIB Library” – This section provides a list of the members in the Tape/Copy JCLLIB library and their uses.

Appendix C, “PARMLIB Library” – This section provides a list of the members in the Tape/Copy PARMLIB library and their uses.

Appendix D, “SYSOUT Report DDs” – This section provides a table of the Tape/Copy jobs report names and DDs that can be used to override where they are printed.

Appendix E, “Frequently Asked Questions” – This section provides a list of some of the most frequently asked questions users have asked Technical Support regarding the Tape/Copy product.

Appendix F, “Usage Examples” – This section provides examples of a few common ways that a data center can use Tape/Copy.

2 Introduction to Tape/Copy

TOPICS COVERED IN THIS CHAPTER

Overview (page 2-2)

Tape/Copy Features (page 2-2)

Copy and Output Options (page 2-3)

How Tape/Copy Works (page 2-5)

Move vs. Copy (page 2-6)

Output Tape Characteristics (page 2-6)

Tape/Copy's Primary Selection Panel Options (page 2-7)

Overview

Tape/Copy is a highly developed system for migrating, consolidating and providing location management of tape datasets. It is an ISPF panel driven MVS system software product that automatically selects datasets and generates JCL to perform tape-to-tape copies.

Tape/Copy uses information extracted from the tape management system database and user specified criteria to select candidates to be copied or moved to different tape media. The JCL built by Tape/Copy will perform all required MVS cataloging and uncataloging functions and will perform the necessary updates to the tape management system database.

Tape/Copy generates an Audit Log to keep track of all datasets that were moved, along with their previous and current characteristics. As a precautionary measure, Tape/Copy provides ESTAE protection for the conversion process. This allows Tape/Copy to back out all changes if a conversion has failed reducing manual intervention from the user.

Note Tape/Copy is a tape-to-tape utility. It does not support the selection or copying of DASD resident datasets. (The Virtual Data Recovery - VDR - "add-on" component to Tape/Copy does support recovering tape backup to DASD. VDR authorized users can reference the "Virtual Data Recovery (VDR) Guide" for more information about this feature.)

Tape/Copy Features

Selection Capabilities

Tape/Copy is one of the most flexible tools on the market. It allows users to select tape datasets based on many customizable options. The following list shows some of the many selection parameters available in Tape/Copy:

- Minimum/Maximum size range
- Minimum/Maximum expiration date range
- Minimum/Maximum creation date range
- Minimum/Maximum days idle
- Selection by automated tape library location
- Selection by virtual tape library location
- Exclusion/Inclusion by dataset name
- Exclusion/Inclusion by dataset name and creation job name combination
- Exclusion/Inclusion by catalog device type
- Exclusion/Inclusion by volser
- Exclusion/Inclusion by account code
- Exclusion/Inclusion by creating system ID
- Exclusion/Inclusion by creating program name
- Exclusion/Inclusion by creating job name
- Exclusion/Inclusion by label type

- Exclusion/Inclusion by tape vendor
- Exclusion/Inclusion of uncataloged datasets
- Selection by dataset type
- Selection by tape format type
- Selection by compression type
- Selection by multi-volume status
- Selection by stacked file status
- Selection by SMS tape ACS routines
- Select and manage entire tape libraries by slot id
- User exit points to customize selection criteria

Copy and Output Options

Tape/Copy allows users to manipulate the selected datasets and the conversion jobs in the following manner:

- Enhance data movement performance by adjusting copy mode and copy engine settings
- Adjustable input tape retention prior to scratching
- Multiple user notifications per job
- Optional Tape Pre-Pull List Reports
- Automatic/Dynamic/Specific tape drive selection
- Number of datasets per job limitation
- Number of tapes per job limitation
- Number of megabytes per job limitation
- Unstack previously stacked datasets
- Extract a stacked dataset to a separate tape
- Stack datasets
- Create co-location stacking rules that can allow datasets of certain names, similar expiration dates, or other criteria to be stacked together
- Manage the retention of stacked tapes
- Populate a virtual tape library
- Copy tape datasets written with proprietary data formats (such as DFDSS, FDR, SAR (CA-View) and others)
- Use tape slot IDs instead of tape volume serial numbers when pre-pulling tapes in tape libraries that are racked by vault slot id rather than by tape volume serial number
- Create job triggering rules to better control the job flow of conversion job processes
- Reblocking datasets during conversions to maximum I/O when the converted datasets are used by production programs
- Erase residual data from the end of the output tape for added security

- The Library Management feature includes the Tape Browse, Tape Erase, Tape Certify and Label, and Recover Overwritten Files utilities.

Optional Features

The following features are available at additional cost.

Tape/Copy with Virtual Data Recovery (VDR)

- Change (singularly or in mass) tape dataset names when the output tapes are created.
- Create new dataset names for copied tapes that can be cataloged without uncataloging the original input tape.
- Create "Dual Copies" of mission-critical datasets with new names for data availability or disaster recovery purposes.
- Recover Dual Copies to tape media or directly to DASD.

Note For more information regarding Tape/Copy with Virtual Data Recovery, please see the Tape/Copy "Virtual Data Recovery (VDR) Guide" and/or contact your Tape/Copy sales representative.

Tape/Copy with CopyCrypt (File Encryption)

- Select dataset for encryption based on a number of different criteria
- Encrypt datasets to multiple levels of encryption, or without encryption, on the same output tape
- Supports DES, Triple-DES (3DES), and AES
- Offers compression of data prior to encryption
- Uses IBM key interface (ICSF) and your mainframe's Cryptographic Co-processor hardware, or the CopyCrypt software encryption and its own key management system
- Supports encryption of VDR Dual Copy backups
- Supports decryption during VDR Recovery to tape or DASD

Note For more information regarding the CopyCrypt product, please see the CopyCrypt User Guide and/or contact your Tape/Copy sales representative.

How Tape/Copy Works

This section provides a brief overview of a typical Tape/Copy “Mass Copy” procedure. These steps may need to be changed depending on the results desired and the function being performed. It is only intended as an outline of how Tape/Copy works.

1 **Complete Tape/Copy ISPF panels**

The user specifies selection criteria and characteristics of the desired output media using Tape/Copy’s ISPF panel options.

2 **Submit Candidate Selection Job**

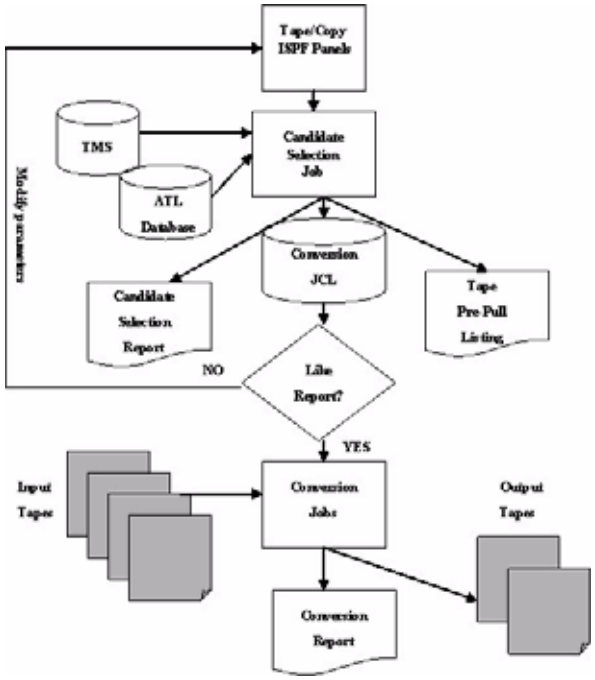
A batch job called the Candidate Selection job is submitted to the JES queue. This job creates an extract of the tape management system database and compares it to the user-specified criteria to generate a list of candidates. It then creates selection, rejection and forecasting and pull list reports, along with the conversion JCL that is used to copy the selected candidates to the output tape using criteria the user specified.

3 **Submit Conversion Jobs**

The jobs that Tape/Copy produces to perform the actual copying or moving of data are called Conversion jobs. These jobs will copy/move the data to the new tape and make all necessary updates to the system catalog and the tape management systems database.

Process Flowchart

This flowchart shows an example of a Tape/Copy stacking process.



Move vs. Copy

Tape/Copy provides the user the option to either move or copy tape datasets (with or without stacking).

MOVE - Moves all datasets from the input volumes onto scratch (output) volumes and will mark the input volume for expiration by the tape management system scratch job. Any input files that were cataloged will be uncataloged as a result of the move.

COPY - Copies all datasets from the input volumes onto scratch (output) volumes but keeps the input volume intact (does not mark it to be expired).

Output Tape Characteristics

Tape/Copy does not alter the characteristics of datasets as they are copied. The input dataset characteristics (BLKSIZE, RECFM, LRECL, creating job name, creation date, etc.) are copied to the output dataset unchanged. This ensures that the output dataset that Tape/Copy creates is an exact replica of the input dataset.

Note If the user chooses to use the Tape/Copy Reblocking features in Chapter 16, the input dataset and output dataset created by Tape/Copy will be the same with the exception of the blocks.

Tape/Copy's Primary Selection Panel Options

The following chart lists the options available on the Tape/Copy Primary Selection Panel menu, and lists the tasks performed by selecting those options.

Use panel option...	to perform the following...	for more information...
0 Parmlib	Update user/system settings Update tape selection default tables Update Tape/Copy's JCL models Clear OTTCPROF ISPF profile	See Chapter 26
1 Mass Copy	Specify tape selection criteria for converting many datasets Generate/run Candidate Selection job Generate Conversion job JCL	See Chapter 27
2 Copy on Demand	Copy/move one (or a few) dataset or tape based on specific dataset name or volser (rather than based on Candidate Selection criteria)	See Chapter 28
3 ACS Copy	Use SMS ACS routines as selection criteria for converting many datasets Generate/run Candidate Selection job Generate Conversion job JCL	See Chapter 29
4 Audit Log Rpt	Generate a report of successfully converted (moved) tapes	See Chapter 30
5 Tape Analysis	Generate JCL to perform an analysis of tape files or volumes	See Chapter 31
6 Tape Compare	Generate JCL to compare tape files or volume sets	See Chapter 32
7 Recycle Stacked	Generate JCL to Recycle Files on Stacked Tapes	
V VDR Options	See "Virtual Data Recovery (VDR) Guide" for details on this optional feature	See "Virtual Data Recovery (VDR) Guide"
LM Tape Browse	Display tape dataset name, volser, label type, and other identifying information by "browsing" the tape dataset	See Chapter 34
CC Key DB Maint	See CopyCrypt User Guide for details on this optional feature	See CopyCrypt User Guide

3 Improving Tape Operations with Tape/Copy

TOPICS COVERED IN THIS CHAPTER

Automated Tape Library Maintenance (page 3-2)

Media Upgrades (page 3-2)

Media Removal (page 3-2)

Scratch Reclamation (page 3-3)

Stacking (page 3-3)

Unstacking (page 3-3)

Extraction (page 3-3)

”Recycle” Previously Stacked Tapes (page 3-4)

Virtual Tape Library Population (page 3-4)

Vaulting and the Virtual Tape Library (page 3-4)

Optional Tape/Copy Features (page 3-5)

Introduction

Tape/Copy is a highly versatile tool that is designed to provide solutions to many common data center concerns. This chapter provides an overview of some of the most common ways that Tape/Copy can improve data center operations.

Automated Tape Library Maintenance

Most automated tape library management software has the ability to notify the console operator when scratch levels in a specific ATL are low. However, this would normally require tape operators to manually eject tapes that have not been used recently, and then inserting new scratch tapes into the ATL.

Tape/Copy can help make this a less manual task for the tape operators by selecting inactive/idle tapes (number of days idle is customized by the user) and “logically ejecting” them from the ATL by moving the data to volumes outside of the ATL. The volumes in the ATL are then scratched by the tape management system’s regularly scheduled scratch job. The selection job created by Tape/Copy to perform this task can be saved and put into production through your job scheduling package to perform this maintenance task periodically which should reduce the effort needed by tape operators to manually maintain appropriate ATL scratch levels.

Tape/Copy can also be used to make your automated/virtual tape libraries more productive by identifying frequently accessed datasets that are on tapes outside of the ATL. The data on these tapes can be copied to ATL resident tapes to reduce the number of manual tape operator mounts. This decreases the mount time for those frequently requested tape mounts.

Media Upgrades

Tape/Copy can prove to be invaluable for media upgrade projects. Tape/Copy can select datasets based on their media type and copy them to the new, higher density tape media. Tape/Copy’s candidate selection job will select the datasets to be moved and create conversion jobs to perform the actual copying process. Tape/Copy will perform all necessary MVS catalog and tape management catalog updates, and can also produce pull list reports of the tapes to be copied so that the tape operators can gather the tapes before the conversion job runs to ensure that the mounts are made quickly.

Media Removal

Tape/Copy is able to utilize the vendor field of the tape management system to identify the manufacturer of a tape volume. If there is a recall of a certain manufacturer’s tape media, the user can select tapes based on the vendor and copy the datasets to new media so that the “bad” tapes can be returned or destroyed.

Scratch Reclamation

Tape/Copy can be used to select multi-volume tapes and copy the data onto a higher density media to possibly reduce the number of volumes to a single volume. This will increase the number of scratch tapes available and take full advantage of hardware upgrades that create higher densities (IDRC) and more tracks per tape.

Stacking

One of Tape/Copy's most powerful features is its stacking capability. Tape/Copy can stack tape datasets together to reduce the collective number of tapes used by individual tape datasets. Stacking datasets can especially be useful in reducing the cost of off site vault storage since there would be less tapes and less vault slots would be needed. Stacking is also a great idea for datasets that must be kept for years but will probably not be read again.

Tape/Copy offers many options while stacking; including:

- Co-Location tables can be defined by the user to control which datasets will get stacked together.
- The Stack Management Control feature can be used to control the expiration of volume sets so tapes do not get scratched prematurely just because the first volume on the stack has expired.
- Stacking Conflict Avoidance is available to help prevent datasets that are historically (according to the user's SMF data) used at the same time from being stacked together.
- Parameters are available to control the order of which the datasets are stacked on each tape, to control the percentage to which a tape should be utilized.

Additionally, TapeCopy supports stacking to pre-existing volume by use of the co-location table and with the limitation that the output volume cannot span onto additional volumes (see STACKING GROUPS later in this manual).

Unstacking

If dataset stacking is no longer a viable tape management strategy at your data center, or if there is some other reason that you no longer need to have datasets stacked onto your tape media, Tape/Copy can be used to select datasets based on user criteria and create conversions jobs that will move the datasets that are stacked onto their own separate tapes. Tape/Copy performs all necessary updates to the system catalog and the tape management system.

Extraction

Tape/Copy's EXTRACT feature allows you to separate a single dataset from a stacked tape and move it to a separate tape. This feature is useful for situations where two datasets got stacked together but need to be used concurrently.

”Recycle” Previously Stacked Tapes

Tape/Copy provides users with a means to select only certain files on a stacked tape and copy only those selected files. This is very useful for those that have stacked tapes with only one or two unexpired datasets remaining on them, which prevents the tape from being scratched and reused. Tape/Copy can select the unexpired datasets (or select the datasets using other criteria as specified by the user) and stack them onto a new tape along with other datasets from underutilized volumes.

Virtual Tape Library Population

Tape/Copy provides a convenient method to populate a virtual tape library. Virtual tape is invaluable in today’s data center for relieving the pressure of finding adequate tape storage on the tape floor, and for taking advantage of the speed and performance increases that come from reducing manual tape mount intervention. Tape/Copy can be used to quickly populate a virtual tape library so that the benefits of the hardware can be seen as soon as possible. Tapes can be selected for movement into the virtual tape library by many different types of user defined criteria.

If your data center has already defined SMS ACS routines for targeting new tape allocations to your virtual tape library, Tape/Copy’s ACS Copy feature can use those same ACS routines to determine which preexisting datasets should be moved into the virtual tape library.

Vaulting and the Virtual Tape Library

A conflict that can occur when virtual tape is introduced into a data center is that virtual tape is in a closed subsystem and tape datasets that reside within it cannot be physically ejected to be sent to an off site vault. It seems the decision would need to be made whether a dataset needs to be kept out of the virtual tape library so that it can be vaulted, or if it is not critical enough that it needs to be sent off site and can benefit from the performance of the virtual library.

Tape/Copy provides a wonderful solution to this dilemma by allowing datasets to be initially allocated and used within the virtual tape library so that you reap the benefits of virtual tape’s speed and performance. However, when the datasets need to be vaulted Tape/Copy can be used to logically move the datasets from virtual tape and stack them onto physical tapes that can be sent to the off site vault. Stacking the output tapes lowers your overall vaulting costs because less tapes need to be sent out. Also, if you chose to copy, rather than move, the datasets from virtual tape, you will still have a copy of the dataset on site that can be accessed right when you need it. This feature could greatly reduce or eliminate dataset recalls from the vault.

Optional Tape/Copy Features

The following features are available at additional cost.)

CopyCrypt - File Encryption

Tape/Copy with CopyCrypt gives users the ability to protect their data by encrypting the tape data during conversion or back up. CopyCrypt can compress the data prior to encryption to maintain maximum tape utilization while protecting your most sensitive data. CopyCrypt uses Tape/Copy's same robust dataset selection process and performs selective encryption and decryption of candidate datasets in Tape/Copy and/or VDR processing by utilizing the IBM Integrated Cryptographic Service Facility (ICSF) and Cryptographic Co-processor hardware available on most IBM mainframes.

CopyCrypt features the same stacking capabilities available with Tape/Copy, and can be used by VDR users (see below) to encrypt their sensitive Dual Copy backup data and then decrypt the data as its being restored to either tape or DASD.

Virtual Data Recovery (VDR)

Tape/Copy with VDR offers users the ability to create Dual Copy backups of critical datasets. These Dual Copy backups are given new names so that they may remain cataloged, and are given permanent retention so that Tape/Copy has a means of controlling their expiration (through the use of the Dual Copy Clean-up Utility). These Dual Copies can be restored selectively to their original dataset names by the Dual Copy Recovery feature in the event that an emergency causes the original datasets to be lost. The Dual Copies can also be encrypted using the CopyCrypt option mentioned above.

Dataset Newnaming

Besides data recovery, Tape/Copy with VDR also has a newnaming feature. The Newnaming feature allows users to rename tape datasets as they are copied/moved to allow another cataloged copy of the same dataset. These copies can then be used as backups or for application testing without changing the original datasets. The newnamed tape datasets can also be used in a vaulting strategy to simplify your vault patterns by using different dataset names for the copy being sent to the vault and keeping both the original and the renamed copy listed in the system catalog.

Warning For more information regarding VDR or Dataset Newnaming, please see the Tape/Copy "Virtual Data Recovery (VDR) Guide" and/or contact your Tape/Copy sales representative.

Warning Tape/Copy provides a free utility called the VDR Implementation Analysis utility that can be used to gather SMF extract data which can then be sent to OpenTech Systems for analysis. See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

4 Implementation Considerations

Topics Covered In This Chapter

Introduction (page 4-2)

ZARA (SUL vs. SL Tapes) (page 4-2)

Control-T R6.1 (page 4-2)

DFSMSrmm EDGHSKP Function (page 4-3)

DFSMSrmm RETAINBY option (page 4-3)

Tape Label Considerations (page 4-3)

Cycle Control File Retention (page 4-4)

SYNCSORT z/OS (page 4-4)

Large Block Interface (LBI) (page 4-5)

Tape/Copy DR Site Considerations (page 4-5)

Processing RECFM=VB Datasets (page 4-6)

Bypassing Currently Utilized Volsers (page 4-6)

Introduction

This chapter contains items that should be reviewed by all users before using the Tape/Copy utility. Tape management system APARS or PTFs are sometimes needed in order for Tape/Copy to function properly. And occasionally, there are precautions that need to be made by the user.

In addition to the items listed in this chapter, it is recommended that users visit OpenTech's Support website and check for any new notices that were created after this manual had been published.

http://www.opentechsystems.com/support.php

There is also a section in the Tape/Copy Installation Guide that discusses Tape Management System Considerations.

Warning While Technical Support does its best to identify and inform our customers of any tape management system issues/fixes that could adversely affect Tape/Copy processing, we cannot guarantee that we have identified every fix. The user is ultimately responsible for staying up to date on all tape management system maintenance.

ZARA (SUL vs. SL Tapes)

The ZARA API is indicating SUL tapes as SL tapes so Tape/Copy is unable to distinguish between SL and SUL and will treat all SUL tapes as SL tapes. Processing an SUL tape as SL will not cause an error, it will just create a copy that has SL labels instead of SUL labels. A fix may be available from ZARA support, or the bypass is to identify all SUL volsers and place them in the EXCLVOLS member of the Tape/Copy PARMLIB so that they are excluded from Tape/Copy processing.

Control-T R6.1

The minimum maintenance level required for IOA is PTF PA07398, which updates load module IOADBS. The minimum maintenance level required for Control-T (Control-M/Tape) is PTF PA07946, which updates load module CTTDBT. Prior to these PTFs, the tape database could be corrupted by jobs running in a shared database environment. Control-T T6.1 users are urged to contact BMC to verify that they have all applicable maintenance applied to IOA and Control-T.

DFSMSrmm EDGHSKP Function

Various Tape/Copy jobs execute PGM=EDGHSKP, with PARM='RPTEXT,DATEFORM(J)', to obtain a copy of the RMM database. EDGHSKP is also used by data centers to perform RMM housekeeping (scratch processing, storage location management, VRS processing, etc.).

RMM only allows one instance of EDGHSKP to run at a time. Any attempt to run EDGHSKP when another instance of EDGHSKP is already running will result in a failed job and will generate RMM message EDG6205E.

Tape/Copy's call to EDGHSKP can be bypassed by inserting:

```
//BYPSDUMP DD DSN=<edghskp.file>
```

into the Tape/Copy job JCL. This will cause Tape/Copy to use an RMM extract dataset that has previously been created (must be in Julian format).

Another way to avoid this problem is to create a simple queuing mechanism for jobs that invoke EDGHSKP by adding a dummy DD that points to a predefined dataset using DISP=OLD in every job step that calls EDGHSKP. This will cause those jobs to process one at a time without failing since only one job step can have the DISP=OLD control of the dummy dataset at a time.

DFSMSrmm RETAINBY option

The DFSMSrmm RETAINBY(VOLUME), the default option, expiration/retention feature can expire volumes within an original multi-dataset stacked volset. The remaining original volumes are not sequence numbered consecutively.

Installations that use this feature should carefully review the Parameter Guide descriptions of the ALLOW-MISSING-INPUT-DATASET-VOLUME, BYPASS-END-OF-VOLSET-TEST, FORCE-BROKEN-MULTIVOL-SELECTION parameters.

Tape Label Considerations

Tape/Copy supports the following label types for input:

SL	NL	NSL	SUL	LTM	AL1	AU1	AL3	AU3

and following label types are supported for output:

SL	NL	NSL	SUL	LTM	AL3 or AL4

Non-Standard Labels (NSL)

Non-Standard Labels are read, verified and created by MVS system installation exits. **These exits must be in place for Tape/Copy to successfully process NSL tapes**. If you do not have these exits installed, or if you do not wish to process NSL tapes with Tape/Copy, you can exclude them from processing by adding “NSL” (without quotes) to the EXCLTLBL member of the Tape/Copy PARMLIB library.

ANSI / ISO Labels (AL1, AL3, AL4)

All formats of ANSI/ISO label tapes can be read by MVS, but your system determines what type of AL labels are written to output AL tapes. Under MVS, only AL3 and AL4 are supported for output processing.

Standard User Labels (SUL)

When Tape/Copy is aware that the input tape has standard user labels (gotten by querying the TMC) it will do one of two things:

- If FORCE-EOV-ON-OUTPUT: YES and OUTPUT-FILE-FORMAT: ASIS are both coded, then all input user header and trailer labels will be copied to the output dataset's tapes(s).
- If either or both of those parameters are not set as above, then ONLY the very first user header label and last user trailer label will be copied to the output dataset. Without these parameters set as in 1, there may be more or less data on on a single dataset's input tapes than on its output tapes, or more or fewer physical tapes. In both cases, either certain labels can't be copied or may have incorrect information.

Note When a given input dataset does not span volumes, all of its user labels will always be copied regardless of the user parameter settings.

Cycle Control File Retention

Warning Datasets that are retained solely by cycle control can be prematurely expired if Tape/Copy's conversion job runs at the same time as your tape management systems' scratch processing. To avoid this situation, you should either:

- Exclude cycle control datasets from being processed by Tape/Copy when the conversion may run at the same time as your scratch processing by using the Expiration Type Selection Panel invoked through the Candidate Selection panel (when creating the conversion JCL).

  OR

- Not allow your scratch processing to run when a Tape/Copy conversion job is executing.

SYNCSORT z / OS

Tape/Copy requires that SYNCSORT fix EW5624 (SORTOUT DD does not get deallocated after dataset is closed when FREE=CLOSE) when Tape/Copy is used on systems with SYNCSORT z/OS.

Large Block Interface (LBI)

Tape/Copy supports Large Block Interface (LBI) but all IBM APARS relating to LBI (such as, UW88389) should be applied for Tape/Copy to function correctly when using LBI. The tape management system being used also has to be at a level that supports LBI.

Tape/Copy DR Site Considerations

When the DASD configurations at the DR site and original site do not match:

1. Check to insure that any DASD volsers referenced in the Tape/Copy parameters do exist or are updated to match the DR configuration.
2. Be sure that the MVS ICF catalog entries for all Tape/Copy datasets, permanent and temporary, reflect a volser that is restored at the DR site. when the MVS catalog does not match the restored DASD configuration, the Tape/Copy temporary datasets should be uncataloged and/or deleted.
3. The following parameter list may be used as a guide to determine which datasets can be uncataloged and will be recreated by Tape/Copy:
   - AUDIT-LOG-FILE-GDG-BASE-NAME
   - CNV-JOB-TRIGR-CTRL-DSN
   - CONVERSION-JCL-TARGET-DATASET-NAME
   - DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX
   - DYNAMIC-ALLOCATION-VOLSER
   - DYNAMIC-ALLOCATION-VSAM-DATA-VOLSER
   - DYNAMIC-ALLOCATION-VSAM-DATASET-NAME-PREFIX
   - DYNAMIC-ALLOCATION-VSAM-INDEX-VOLSER
   - STATISTICS-FILE-GDG-BASE-NAME
4. The following parameter list may be used as a guide to determine which permanent datasets must be restored and correctly cataloged:
   - TMS-DATABASE-NAME
   - TMS-RETENTION-CONTROL-FILE-NAME
   - TMS-SECOND-DATASET-NAME
   - TMS-SECOND-PARMLIB-NAME
   - TMS-THIRD-DATASET-NAME
5. The following Tape/Copy PARMLIB library members may also contain dataset names that must be restored and correctly cataloged:
   - CNVS2JCL
   - LIBRYDEF
6. The following Tape/Copy REXX library members also contain dataset names that must be restored and correctly cataloged:

- OTTC@PRM
- TAPECOPY

Processing RECFM=VB Datasets

Tape/Copy's EXCP copy engine copies RECFM=VB datasets using special channel programming that is dependent on valid Block Descriptor Words (BDWs) that give the size of each block, in order to get much improved read performance. Because of Tape/Copy copy engine's special handling of these datasets, if it encounters a dataset with invalid BDWs the job will terminate with an error.

Warning This special handling only applies to datasets being copied by Tape/Copy's EXCP copy engine.

Occasionally, users may wish to bypass Tape/Copy's normal handling of RECFM=VB datasets so that datasets with invalid or incorrect BDWs can be copied. The parameter

EXCP-BYPASS-SPECIAL-RECFMVB-HANDLING can be set to do this. By default, the parameter is set to NO so that the special handling is used. When set to YES, Tape/Copy will use a different channel program that does not depend on BDWs and it will also not check the validity of any BDWs. This will allow datasets with bad BDWs to be copied, but will reduce the copy performance of all RECFM=VB datasets.

Warning EXCP-BYPASS-SPECIAL-RECFMVB-HANDLING should only be set to YES when necessary to copy a dataset that is failing due to invalid BDWs. It should NOT be set to YES permanently (set the parameter value using the PGMSETS DD statement rather than the USERSETS member of the Tape/Copy PARMLIB).

Tape/Copy also provides a parameter called EXCP-ASSUME-18-BYTE-PADDING, which the user can specify to tell Tape/Copy whether or not to assume that 18 byte padding is in effect for RECFM=V/VB datasets. (MVS QSAM pads RECFM=V/VB user blocks that are shorter than 18 bytes to make them 18 bytes long). This parameter is set to NO by default.

Bypassing Currently Utilized Volsers

Tape/Copy will exclude volumes that are currently being utilized during the first phase of candidate selection. Also, Tape/Copy conversion jobs perform a series of checks to see if tapes about to be copied in the conversion job are currently in use by another job. If so Tape/Copy will check every few seconds for the duration of time specified in the MINUTES-TO-WAIT-FOR-VOLSERS-TO-FREE-UP parameter, to see if they become free (if this parameter is set to zero, no waiting will occur). If any of the volsers in the conversion job volume set do not free up within the specified time period, Tape/Copy will skip the entire volume set and issue a rejection message stating the volser that was in use by another job. The Tape/Copy conversion job will also reject tapes that have been changed since the conversion job has been created.

Contention issues can still occur, even with this feature in place, since there is the chance that the volser will be called for by another job after Tape/Copy has checked the status of the volume set. However, this feature will greatly reduce such occurrences.

Warning This feature is used by default with Tape/Copy and cannot be “turned off” by a user parameter.

5 Processing Proprietary Data Formats

Topics Covered In This Chapter

DB2 (page 5-2)

DFSMShsm (page 5-3)

DMS/CA-Disk (page 5-5)

EOS (page 5-8)

FDRABR (page 5-8)

FDR TYPE=APPL (page 5-8)

FDR/Upstream (page 5-9)

OAM (page 5-9)

IMS (page 5-10)

Mobius Infopac (page 5-11)

SAR/CA-View (page 5-11)

PROPRIET Table Setup for Generic EDM Tapes (page 5-12)

Other Data Formats and Considerations (page 5-13)

Introduction

While the EXCP data copy engine used by Tape/Copy is capable of copying any type of data, there are a few special considerations for moving and/or copying certain proprietary data formats. Check the following if you create these data formats:

- ASG-Zara
- DB2
- DFSMShsm
- DMS/CA-Disk
- EOS
- FDRABR
- FDR TYPE=APPL
- IMS
- Mobius Infopac
- SAR/CA-View
- Other Data Formats and Considerations

DB2

Tape/Copy can process DB2 datasets provided that the new tape (the output tape) created by Tape/Copy is cataloged to the system/ICF catalog (since DB2 will check the ICF catalog for the volser before checking its own DB2 catalog). The PROPRIET member of the Tape/Copy PARMLIB has been set up so that, by default, Tape/Copy will only select and process cataloged DB2 datasets as input and will reject uncataloged datasets created by DB2. When processing DB2 datasets the user must select:

- OUTPUT-DATASET-CATALOGING: CATALOG – if the original DB2 input tapes are not cataloged to the system catalog.

  or

- OUTPUT-DATASET-CATALOGING: ASIS – if the original DB2 input tapes are cataloged to the system catalog.

Warning The output tapes that Tape/Copy creates when copying DB2 datasets have to be cataloged in order for DB2 to locate the data on the new tapes. DO NOT set OUTPUT-DATASET-CATALOGING: UNCATALOGED when processing DB2 datasets.

PROPRIET Table Setup for DB2

The following default entry is included in the default PROPRIET member of Tape/Copy's PARMLIB:

```
* FILE                  CREATING CREATING       BLOCK REC
* TYPE   DSN            JOBNAME  PGMNAME  LRECL SIZE  FM  CTLGD PROCES
*
DB2      *DB2/          /        /        /     /     /     N      N
```

The above entry tells Tape/Copy not to process any uncataloged datasets that have "DB2" in the dataset name. Unless other entries are added regarding DB2 by the user, the default PROPRIET member would reject the uncataloged DB2 datasets and allow the standard EXCP conversion engine to copy the cataloged DB2 datasets.

DFSMShsm

Available to CA-1, Control-T, TLMS, ZARA and DFSMSrmm users.

Tape/Copy is capable of processing DFSMShsm backup tapes using the Tape/Copy EXCP conversion engine. The conversion process will automatically update the DFSMShsm database for each DFSMShsm migration or backup data set that was identified by the PROPRIETmember table entries and successfully processed.

The user also has the option of including a DD statement named HSMREPLS in the conversion job JCL which will cause Tape/Copy to write the necessary DFSMShsm commands to the HSMREPLS DD instead of automatically performing the DFSMShsm database updates. The DFSMShsm commands in the HSMREPLS dataset can then be used in batch to update the DFSMShsm database.

When processing DFSMShsm tapes, the Tape/Copy conversion job will print an additional report called the DFSMShsm Update Report (see Chapter 12 for a sample).

PROPRIET Table Setup for HSM

The PROPRIET member of the Tape/Copy PARMLIB contains default entries intended to differentiate between backup and migration tapes, and others created by DFSMShsm, however the user needs to review these entries to verify that they will correctly identify the DFSMShsm tapes created by their data center.

```
* FILE                  CREATING CREATING       BLOCK REC
* TYPE   DSN            JOBNAME  PGMNAME  LRECL SIZE  FM  CTLGD PROCES
*
DFSMSHSM *.HMIGTAPE.DATASET /   ARCCTL   /     /     /     /      Y
DFSMSHSM *.BACKTAPE.DATASET /   ARCCTL   /     /     /     /      Y
DFSMSHSM /             /        ARCCTL   /     /     /     /      N
```

Warning If you have upgraded from an earlier release of Tape/Copy (pre-R2.6.2), you may have to add these PROPRIET table entries manually and replace the previous DFSMShsm related entries!

Considerations Regarding HSM

Users that plan to copy DFSMShsm tapes using Tape/Copy should note the following items to avoid undesirable results.

- DFSMShsm must be active on the system on which the Tape/Copy conversion job is running when processing DFSMShsm tapes.
- The batch job user id used to perform the conversion and HSM updates must be authorized by DFSMShsm to update the CDS.
- DFSMShsm tapes can only be moved (or recovered) to tape volumes that have the same or greater capacity as the original volume. This restriction applies to Tape/Copy MOVE, and to VDR recovery, not to VDR backup.
- When a tape management system other than DFSMSrmm is used, the DFSMShsm backup and migration tapes must be defined as externally managed tapes (EDM tapes). Since Tape/Copy, by default, does not process EDM tapes, **CA-1, Control-T, TLMS and ZARA users must change the PROCESS-EXTERNALLY-MANAGED-TAPES parameter value to "YES" when processing DFSMShsm tapes with Tape/Copy.**

Warning VDR users should also review the considerations for DFSMShsm listed in the "Virtual Data Recovery (VDR) Guide", as those pertain specifically to creating/recovering DFSMShsm Dual Copy backups. See "DFSMShsm Considerations" in Chapter 3 of the VDR Guide.

Processing ABARS Tapes

Tape/Copy is able to copy and move ABARS volume sets, provided that they are not recorded as EDM (externally managed) datasets in the tape management system. Control-T users that process ABARS data with Tape/Copy should use CTTPARM entry RECREATE=P to allow the permanent dataset to be reopened.

Warning Only ABARS tapes that are cataloged in the ICF catalog should be processed by Tape/Copy.

DMS/CA-Disk

Available to CA-1, Control-T and DFSMSrmm users only.

Tape/Copy supports the conversion (DATA-COPY-FUNCTION: MOVE) and VDR Dual Copy backup of tapes created by DMS/CA-Disk R9 and R11. Using the DMS/CA-Disk Common File Handler Interface (as documented in the DMS Systems Guide), Tape/Copy updates the FILES dataset after the DMS/CA-Disk tape data is copied to a new tape. The DMS/CA-Disk FILES dataset that corresponds to the tape to be processed must be identified to Tape/Copy using the DMS/CA-DISK-FILES-DATASET parameter, or by setting DMS/CA-DISK-FILES-DATASET: NONE and adding a FILES DD statement to the Tape/Copy candidate and/or conversion job JCL.

Warning Only one DMS/CA-Disk FILES dataset can be referenced by each Tape/Copy job.

Tape/Copy creates an ARCHVOLS record for each output tape created, with data copied from the ARCHVOLS records of the corresponding input tapes. Then the ARCHVOLS and DSNINDEX files are searched for any references to the input volumes. Any references found are updated to the corresponding output tape volume. Finally, the ARCHVOLS records of the input tape volumes are deleted from the FILES dataset.

Tape/Copy builds a log file of all of the FILES dataset records that it has updated, added or changed (for auditing purposes only). This log will be named @dsprefix.DMSUPLOG.Dyyyyddd (where yyyy is the year and ddd is the Julian day of the update).

Column(s)	Field Description	Format
1 - 8	Update Date	YYYYMMDD
9-16	Update Time	HHMMSSTH
17-24	JES Job ID	character
25 - 28	Update Number	binary
29 - 29	Update Type	C = Conversion R = Reset
30 - 30	Image Type	B = Before update A = After update
31 - 38	DMS Record Type	DSNINDEX ARCHVOLS
39 - end	DMS FILES Record	text

In order to ensure that no other Tape/Copy jobs will be updating the DMS FILES dataset, Tape/Copy uses an ENQ while the Tape/Copy conversion job is updating the FILES dataset. The ENQ major name is TAPECOPY, the minor name is DMSUPDT and the SCOPE is SYSTEMS. (Users with multisystem environments that share the DMS/CA-Disk FILES dataset should propagate this information to all systems.)

When processing DMS/CA-Disk tapes, the Tape/Copy conversion job will print an additional report called the DMS/CA-Disk Update Report (see Chapter 12 for a sample). The report details the changes that were made to the DMS FILES dataset.

PROPRIET Table Setup for DMS

The PROPRIET member of the Tape/Copy PARMLIB contains default entries intended to identify DMS/CA-DISK datasets and differentiate between archive/backup tapes and tapes created by DMS/CA-Disk's "Sequential Migration to Tape". The PROPRIET member should be reviewed/updated to make sure that the entries within correctly identify DMS/CA-Disk datasets (those that are tracked in the DMS FILES dataset) by dataset name pattern and/or creating program name.

Warning DMS/CA-Disk Sequential migration tapes can be processed by Tape/Copy but the standard Tape/Copy EXCP conversion engine (TAPECOPY) should be used rather than the DMS/CA-Disk engine, as those tapes are not recorded in the DMS CA-Disk FILES dataset.

The default DMS entries for the PROPRIET table (shipped as of Tape/Copy R2.6.1) are listed below. **If you have upgraded from an earlier release of Tape/Copy, you may have to add these PROPRIET table entries manually since the PROPRIET table is not overlaid in the upgrade process as to preserve user customization**!

```
* FILE                  CREATING CREATING       BLOCK REC
* TYPE   DSN            JOBNAME  PGMNAME  LRECL SIZE  FM  CTLGD PROCESS
*
CA-DISK  /              /        ADSMI002 /     /     /     /      Y
DMS      /              /        ADSMI002 /     /     /     /      Y
CA-DISK  DMS./          /        /        /     /     /     /      Y
DMS      DMS./          /        /        /     /     /     /      Y
TAPECOPY /              /        ADSMI000 /     /     /     /      Y
```

The default PROPRIET table entries tell Tape/Copy that any datasets with a creating program name of ADSMI002, or have a high-level qualifier of DMS, can be processed by the Tape/Copy DMS/CA-Disk conversion engine. Datasets with the creating program name of ADSMI000 will be copied by the standard Tape/Copy conversion engine, as noted above.

Externally Managed (EDM) DMS/CA-Disk Tapes

When a tape management system other than DFSMSrmm is used, the data center may define the DMS archive/backup tapes as externally managed tapes (EDM tapes). Since Tape/Copy does not process EDM tapes by default, users that have their DMS data defined as EDM to their tape management system must change the PROCESS-EXTERNALLY-MANAGED-TAPES parameter value to "YES" when processing DMS tapes with Tape/Copy.

Also note that when the tape management system is marking the DMS tapes as EDM, this causes the multi-volume sets to be broken into single volume sets. Tape/Copy uses the information in the DMS FILES dataset (the ARCHVOLS records) to reestablish the multi-volume connection between those separate single volume sets. However, **to ensure that Tape/Copy will be able to produce correct total volume set block count values, it is critical that the user has the PROCESS-EXTERNALLY-MANAGED-TAPES parameter**

set to YES and that the creating program of the DMS tapes begins with ADSMI*. (This is most important when using VDR, because VDR uses the block count to verify that the VDR backup files are accurate versions of each original file.)

Control-T users recording DMS tapes in the tape management system as EDM must establish EDM Rules in Control-T that will cause the DMS files that are created by Tape/Copy to be EDM managed. The DMS/CA-DISK-USE-EDM-ALIAS parameter should be used to force Tape/Copy to use PGM=OTTCDMS3 on any jobs that will be creating DMS tapes (rather than the standard PGM=OTTC0003). This simplifies the creation of the Control-T EDM Rules, which can coded to select any datasets (DSN=*) that are created by PGM=OTTCDMS3, and set the DMS EDM indication (RETENTION = EDM).

Warning Control-T EDM Rules must be coded to correctly mark DMS EDM datasets in order to prevent errors in processing DMS tape files that span multiple volumes.

Considerations Regarding DMS/CA-Disk

Users that plan to copy DMS (CA-Disk) tapes using Tape/Copy should note the following items to avoid undesirable results.

- DMS (CA-Disk) must be active on the system on which the Tape/Copy conversion job is running when processing DMS (CA-Disk) tapes.
- The message below will be displayed for any Tape/Copy job that accesses the DMS/CA-Disk FILES dataset. The message can be prevented by changing the Tape/Copy JCL from executing “PGM=OTTCxxxx” to executing “PGM=ADSMI002,PARM='OTTCxxxx'” (the program name used would be the same as appears in the message the user receives) for any jobs that will be processing DMS/CA-Disk tape files.

  ```
  ADSMI002 MTF002I MI PERFORMANCE IS IMPAIRED, ADSMI002 IS NOT
  THE SUBJECT OF AN ATTACH OR LINK. SEE MODULE OTTC0003.
  ```

  **** Bypassing this message is not recommended.**
- DMS (CA-Disk) tapes can only be moved (or recovered) to tape volumes that have the same capacity as the original volume. This restriction applies to Tape/Copy MOVE, and to VDR recovery, not to VDR backup. The output volset from a Tape/Copy MOVE or VDR recovery cannot occupy more tape volumes than the input dataset occupied due to limitations in DMS/CA-Disk.

Warning VDR users should also review the DMS/CA-Disk Considerations listed in the “Virtual Data Recovery (VDR) Guide”, as those pertain specifically to creating/recovering DMS/CA-Disk Dual Copy backups.

Related Parameter(s)

The following parameters should be reviewed if processing DMS / CA-Disk data with Tape/Copy:

- DMS/CA-DISK-DYNXUNIT
- DMS/CA-DISK-FILES-DATASET
- DMS/CA-DISK-LOADLIB
- DMS/CA-DISK-PARMLIB
- DMS/CA-DISK-USE-EDM-ALIAS
- PROCESS-EXTERNALLY-MANAGED-TAPES

EOS

Tape/Copy can process tapes created by RDS' EOS (Enterprise Output Solution) product. The PROPRIET member is set up to only select EOS tapes that are cataloged in the ICF catalog. It is assumed that the new version will be created as a cataloged tape (e.g. OUTPUT-DATASET-CATALOGING is set to ASIS or CATALOG) to allow EOS to locate the new tape. If an EOS file is multivolume, Tape/Copy will create the output file as multivolume (issuing EOV at the point where EOV is encountered on the input file).

FDRABR

FDRABR uses a proprietary database to keep track of datasets it creates. Tape/Copy is able to process FDRABR datasets and update the FDRABR database so that FDRABR is able to correctly identify the location of the data, by calling the FDRTCOPY program as part of the conversion process. However, when processing FDRABR tapes, Tape/Copy should be set up to MOVE (DATA-COPY-FUNCTION: MOVE); not COPY the datasets. And the jobs should NOT utilize stacking (set OUTPUT-FILE-FORMAT: ASIS, not OUTPUT-FILE-FORMAT: STACK).

FDR TYPE=APPL

As stated above, Tape/Copy can process FDRABR files by invoking the FDRTCOPY program. When FDR's application backup creates DUMP TYPE=APPL backup tapes, it creates a control file either on disk or as the last file on the backup tape. If the control file was written as the last file on tape, Tape/Copy could use FDRTCOPY to copy the backup tapes but FDRTCOPY will not update the control file.

Warning Users should review FDR documentation regarding the use of FDRTCOPY as it relates to TYPE=APPL backups before using Tape/Copy to process those datasets.

FDR/Upstream

Tape/Copy can process FDR/Upstream datasets provided that the new tape (the output tape) created by Tape/Copy is cataloged to the system/ICF catalog (since FDR/Upstream will check the ICF catalog for the volser before checking its own catalog). The PROPRIET member of the Tape/Copy PARMLIB can be set up so that, by default, Tape/Copy will only select and process cataloged FDR/Upstream datasets as input and will reject uncataloged datasets created by FDR/Upstream. When processing FDR/Upstream datasets the user must select:

- OUTPUT-DATASET-CATALOGING: CATALOG - if the original input tapes are not cataloged to the system catalog.

  or

- OUTPUT-DATASET-CATALOGING: ASIS - if the original IMS input tapes are cataloged to the system catalog.

Warning The output tapes that Tape/Copy creates when copying FDR/Upstream datasets have to be cataloged in order for FDR/Upstream to locate the data on the new tapes. *Do not* set OUTPUT-DATASET-CATALOGING: UNCATALOGED when processing FDR/Upstream datasets.

OAM

During candidate selection, Tape/Copy and VDR will validate that each OAM tape dataset and volume are in the OAM database; otherwise, a reject message will be created.

During the Tape/Copy conversion or VDR recovery, the volumes are marked as not writable via the "F OAM,UPDATE,VOL,xxxxxx,WRITABLE=N" command. For this reason, OAM should be active on the system where the conversion or recovery is run. However, the OAM database cannot be updated while OAM is active so the update records are written to a dataset for later processing when OAM is inactive. Until the database is updated, OAM will continue to access the original volumes.

To apply the updates to the OAM database, all OAM subsystems within the sysplex must first be inactive. The update records must then be processed by the Tape/Copy OAM update program OTTC0059. The JCL to run this program is included in the JCLLIB member OAMUPDAT. After the updates have been successfully applied, the update record datasets can be deleted and OAM can be reactivated.

Note The name of the dataset for the update records is created by prefixing DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX to ".OAM.UPDATES". This dataset must be retained until the updates are successfully applied to the OAM database.

Note The OAM update program can now run in simulation mode, allowing DB2 updates to run in non-commit mode while OAM is active. This will allow you to get timings or discover any Storage Group errors before running the process while OAM is down.

PROPRIET Table Setup for OAM

The PROPRIET member of the Tape/Copy PARMLIB contains default entries intended to identify OAM datasets. The default OAM entries for the PROPRIET table (shipped as of Tape/Copy R2.7.3) are listed below. **If you have upgraded from an earlier release of Tape/Copy, you may have to add these PROPRIET table entries manually since the PROPRIET table is not overlaid in the upgrade process as to preserve user customization.**

```
* FILE                  CREATING CREATING       BLOCK REC
* TYPE   DSN            JOBNAME  PGMNAME  LRECL SIZE  FM  CTLGD PROCESS
*
OAM      OAM.PRIMARY.DATA   /   CBROAM   /     /     /     /      Y
OAM      OAM.PRIMARY.DATA./ /   CBROAM   /     /     /     /      Y
OAM      OAM.BACKUP.DATA    /   CBROAM   /     /     /     /      Y
OAM      OAM.BACKUP.DATA./  /   CBROAM   /     /     /     /      Y
OAM      OAM.BACKUP2.DATA   /   CBROAM   /     /     /     /      Y
OAM      OAM.BACKUP2.DATA./ /   CBROAM   /     /     /     /      Y
```

Externally Managed (EDM) OAM Tapes

When a tape management system other than DFSMSrmm is used, the data center may define the OAM object/backup tapes as externally managed tapes (EDM tapes). Since Tape/Copy does not process EDM tapes by default, users who have their OAM data defined as EDM to their tape management system must change the PROCESS-EXTERNALLY-MANAGED-TAPES parameter value to “YES” when processing OAM tapes with Tape/Copy.

Warning The output tapes that Tape/Copy creates when copying OAM datasets must not be cataloged in the ICF catalog. *Do not* set OUTPUT-DATASET-CATALOGING: CATALOG when processing OAM data sets.

IMS

Tape/Copy can process IMS datasets provided that the new tape (the output tape) created by Tape/Copy is cataloged to the system/ICF catalog (since IMS will check the ICF catalog for the volser before checking its own catalog). The PROPRIET member of the Tape/Copy PARMLIB has been set up so that, by default, Tape/Copy will only select and process cataloged IMS datasets as input and will reject uncataloged datasets created by IMS. When processing IMS datasets the user must select:

- OUTPUT-DATASET-CATALOGING: CATALOG - if the original IMS input tapes are not cataloged to the system catalog.

  or

- OUTPUT-DATASET-CATALOGING: ASIS - if the original IMS input tapes are cataloged to the system catalog.

Warning The output tapes that Tape/Copy creates when copying IMS datasets have to be cataloged in order for IMS to locate the data on the new tapes. DO NOT set OUTPUT-DATASET-CATALOGING: UNCATALOGED when processing IMS datasets.

PROPRIET Table Setup for IMS

The following default entry is included in the default PROPRIET member of Tape/Copy's PARMLIB:

```
* FILE                  CREATING CREATING       BLOCK REC
* TYPE   DSN            JOBNAME  PGMNAME  LRECL SIZE  FM  CTLGD PROCES
*
IMS      *IMS/          /        /        /     /     /     N      N
```

The above entry tells Tape/Copy not to process any uncataloged datasets that have "IMS" in the dataset name. Unless other entries are added regarding IMS by the user, the default PROPRIET member would reject the uncataloged IMS datasets and allow the standard EXCP conversion engine to copy the cataloged DB2 datasets.

Mobius Infopac

As with DB2 datasets, Tape/Copy can process Mobius Infopac datasets provided that the new tape (the output tape) created by Tape/Copy is cataloged to the system/ICF catalog (since Mobius Infopac) will check the ICF catalog for the volser before checking its own catalog). The PROPRIET member of the Tape/Copy PARMLIB has been set up so that, by default, Tape/Copy will only select and process cataloged Mobius Infopac datasets as input and will reject uncataloged datasets created by Mobius Infopac. When processing Mobius Infopac datasets the user must select:

- OUTPUT-DATASET-CATALOGING: CATALOG - if the original Mobius Infopac input tapes are not cataloged to the system catalog.

  or

- OUTPUT-DATASET-CATALOGING: ASIS - if the original Mobius Infopac input tapes are cataloged to the system catalog.

Warning The output tapes that Tape/Copy creates when copying Mobius Infopac datasets have to be cataloged in order for Mobius to locate the data on the new tapes. DO NOT set OUTPUT-DATASET-CATALOGING: UNCATALOGED when processing Mobius datasets.

SAR/CA-View

SAR/CA-View uses a proprietary database to keep track of datasets it creates. Tape/Copy is able to process SAR datasets and update the SAR database by calling the SARTCP program so that SAR is able to correctly identify the new location of the data. However, when processing SAR tapes, Tape/Copy should be set up to MOVE (DATA-COPY-FUNCTION: MOVE); not COPY the datasets. And the jobs should NOT utilize stacking (set OUTPUT-FILE-FORMAT: ASIS, not OUTPUT-FILE-FORMAT: STACK). SAR/CA-View tapes can only be moved to tape volumes that have the same or greater capacity as the original volume.

PROPRIET Table Setup for Generic EDM Tapes

The PROPRIET member of the Tape/Copy PARMLIB contains a default entry intended to identify Generic EDM datasets. The default entry for the PROPRIET table (shipped as of Tape/Copy R2.7.4) is listed below.

If you have upgraded from an earlier release of Tape/Copy, you may have to add these PROPRIET table entries manually since the PROPRIET table is not overlaid in the upgrade process as to preserve user customization.

```
*********************************************************************
*
* GENERIC EDM DATASETS (GEN-EDM) ARE DATASETS THAT ARE EXTERNALLY
* MANAGED AND HAVE ATTRIBUTES SPECIFIC TO THE CUSTOMSERS UNDERLYING
* TAPE MANAGEMENT SYSTEM (TMS).
*
* EXAMPLES OF SOME EXTERNALLY MANAGED DATASETS ARE: HSM AND DMS.
*
* THE GENERIC EDM TAPE SUPPORT IMPLEMENTED BY THE OPENTECH PRODUCTS,
* WILL ENSURE THAT ANY EDM RELATED FLAGS AND/OR VALUES REQUIRED BY
* THE CUSTOMERS TMS TO IDENTIFY A TAPE AS EDM MANAGED ARE UPDATED
* AS REQUIRED.
*
* THE FOLLOWING DATA FORMAT TYPE IS SUPPORTED AND CAN BE CUSTOMIZED BY
* THE CUSTOMER BY CHANGING THE FOLLOWING FIELDS:
*
* DSN, CREATING JOBNAME, CREATING PGM, LRECL, BLOCKSIZE, RECFM AND/OR
* CTLGD
*
* TO VALUES WHICH WILL IDENTIFY THE DATASETS TO BE PROCESSED AS
* GENERIC-EDM DATASETS.
*
* BE SURE THAT THE VALUE OF THE PROCESS FIELD IS SET TO "Y" and
* do not change the file type field.
*
* FILE                 CREATING CREATING       BLOCK REC
* TYPE    DSN          JOBNAME  PGMNAME  LRECL SIZE  FM  CTLGD PROCESS
*
GEN-EDM  *.?GEDM!./    /        /        /     /     /     /      Y
*
*********************************************************************
```

Generic Externally Managed (EDM) Tapes

When a tape management system other than DFSMSrmm is used, the data center may define selected tapes as Generic Externally Managed tapes (EDM tapes). Since Tape/Copy does not process EDM tapes by default, users who have datasets defined as Generic EDM to their tape management system must change the PROCESS?EXTERNALLY?MANAGED?TAPES parameter value to “YES” when processing Generic EDM tapes with Tape/Copy.

When a Generic EDM dataset is processed as part of a VDR recovery or a TapeCopy move, the EDM flags and values specific to the customers TMS are copied from the old original volume to the new original volume. Once the move/recovery is successful for a volume, the EDM information for the old original volume is removed and its expiration date is set to permanent.

Other Data Formats and Considerations

If your data center uses any other program products (other than those listed in this chapter) that maintain their own proprietary database, please be advised that while Tape/Copy could physically move the data it has no way of updating the program product's database to reflect the new volser information. Entries should be added to the PROPRIET to exclude the tapes created by any such program products from being processed by Tape/Copy.

The Tape/Copy development team periodically reviews requests for adding support for other program products' data. User's can make suggestions for additional support by emailing an enhancement request to support@opentechsystems.com, however there is no guarantee that support can/will be added. Much depends on the cooperation of the vendor responsible for the program product, and whether there is an interface for Tape/Copy to associate with to update the database.

For information about running a test conversion with Tape/Copy to verify if its able to process a certain data type, See Appendix E, "Frequently Asked Questions".

6 Tape/Copy Housekeeping

TOPICS COVERED IN THIS CHAPTER

Product Maintenance (page 6-2)
Addition/Removal of Tape Hardware (page 6-2)
Conflict Management Database Maintenance (page 6-3)
Stack Management Control Clean-Up (page 6-3)

Introduction

Tape/Copy is generally self-maintaining, as it recreates its work files each time the user runs a candidate selection job (unless the user specifies otherwise). However, there are a few tasks that should be considered in order to keep Tape/Copy running smoothly.

Product Maintenance

Tape/Copy maintenance is available from OpenTech Systems' Support website at:

http://www.opentechsystems.com/support.php.

Registration is required to access the "customers only" area of the website. When registering, the user has the option of checking a box that will include him or her in the distribution list that receives notification via email of any additions to the Support website.

Users are encouraged to keep their Tape/Copy installation current by ensuring current maintenance is applied when it becomes available. If the user is unfamiliar with how to apply maintenance (or is not authorized to do so), please contact the person who installed Tape/Copy or a systems programmer at your site for assistance.

Addition/Removal of Tape Hardware

When the Tape/Copy product is installed, Tape/Copy populates a table called the IOCNTLTB table, which is created using the information in the eligible device table (EDT) on the system where Tape/Copy is running. The IOCNTLTB table (a member in the Tape/Copy PARMLIB) contains all of the device types that Tape/Copy recognizes as available for input/output tape processing. As tape hardware is added or removed from the data center it may become necessary to update or regenerate the IOCNTLTB table.

Also, if the hardware change involved the addition or removal of an automated/virtual tape library, the LIBRYDEF member should be reviewed to make sure the correct ATL manufacturer information and software interface levels are listed. If not, make the necessary updates to the LIBRYDEF entries.

The IOCNTLTB table can be manually updated, but Tape/Copy also provides a utility that can be used to regenerate the table for the user. The JCL for this utility is in the SETUP member of the JCLLIB. Run the ATLNAMES_REBUILD function and then run the IOCNTLTB_REBUILD function to regenerate the IOCNTLTB table. (These processes can be run in the same job.)

Note Complete information on the SETUP utility can be found in Chapter 5 of the Tape/Copy Installation Guide, as these functions are run as part of the initial installation process which creates the tables.

If there are entries in the IOCNTLTB table that the user wishes to leave untouched when the IOCNTLTB_REBUILD process is run, place a 'N' in the REBLD column of the IOCNTLTB table next to that entry and Tape/Copy will not rebuild that entry.

Conflict Management Database Maintenance

Users of Tape/Copy's Stacking Conflict Avoidance feature will need to run the CONFJCL job (which creates/maintains the Conflict Management Database), which is located in the Tape/Copy JCLLIB, on a regular basis. The frequency of which the CONFJCL should be run varies from one data center to another, but running it once or twice a week should be sufficient. Scheduling the CONFJCL to run on a regular basis will prevent the Conflict Management Database from growing too large and will remove any obsolete SMF data from the database.

Note See Chapter 20 for detailed information regarding the use of Tape/Copy's Stacking Conflict Avoidance feature.

Stack Management Control Clean-Up

Tape/Copy's Stack Management Control feature allows the user to control the expiration of volume sets by only allowing the volume set to expire if every dataset on the volume set has expired. This works by having Tape/Copy add a control dataset as the first file of the volume set to control expiration.

The Stack Management Control Clean-Up utility needs to be run on a regular basis to ensure the tapes that are retained by Tape/Copy's Stack Management Control feature are expired once all of the files in the volume set are expired. The JCL for this utility is located in the STKCLEAN member of the Tape/Copy JCLLIB. OpenTech recommends running the STKCLEAN job once a day, but the frequency may need to be altered to fit individual data center needs.

Note See Chapter 19 for detailed information regarding the use of Tape/Copy's Stack Management Control feature.

7 Audit Features and Statistics

TOPICS COVERED IN THIS CHAPTER

Audit Log File (page 7-2)
Audit Log File Record Layout (page 7-3)
Audit Log Report (page 7-3)
Statistics File (page 7-4)

Introduction

Tape/Copy keeps track of each MOVE conversion performed by utilizing the Audit Log file. The Audit Log file tracks the tape management system record and TAPEEXTR (this is the common format that Tape/Copy uses for all tape management systems) record images for the input and output files/tapes that Tape/Copy converts. At the beginning of each conversion process, the records for the input files/tapes are logged and then at the completion of the conversion, the records for the output files/tapes are logged. This process dynamically allocates the current generation and MODs it with the new records, then deallocates the file.

Note The Audit Log file can be used to generate a report listing the datasets that were converted.

Only datasets MOVED, not COPIED, by Tape/Copy are recorded in the Audit Log File to reduce unneeded overhead. Datasets that are only copied are not updated by Tape/Copy so there is no need to keep an audit trail of copy activity, whereas when datasets are "moved" by a Tape/Copy conversion job, the input dataset record in the tape management system and the system are altered so that the input dataset can be expired.

Tape/Copy also maintains a Statistics file which keeps a running count the number (by day) of all Tape/Copy's conversions.

Audit Log File

The Tape/Copy Audit Log file is a GDG based dataset that contains detailed information for every tape processed by a Tape/Copy MOVE operation conversion job.

Note The Audit Log's dataset name is defined by the AUDIT-LOG-FILE-GDG-BASE-NAME parameter value plus the generation/version number (G0001V00) of the GDG, and it is dynamically created if it does not already exist (such as the first time Tape/Copy performs a conversion).

The default allocation for the Audit Log is SPACE=(CYL,(5,5)). This value can be overridden using the DSNALLOC member in Tape/Copy's PARMLIB. If you wish to change AUDITLOG's default space allocation, refer to documentation for the DSNALLOC member.

A new generation can be allocated if Tape/Copy encounters one of the following conditions

- No AUDITLOG generation exist (empty GDG).
- The current AUDITLOG generation becomes full (encounters an Sx37 abend).
- The lifetime of the AUDITLOG generation has ended based on the conditions established by the AUDIT-LOG-FILE-NEW-GENERATION parameter.
- The size of the current AUDITLOG generation has reached the maximum allowable size based on the AUDIT-LOG-FILE-TRACK-ALLOCATION-LIMIT.

The Audit Log file contains a date and time stamp of when the log record was created, the original dataset's first volume serial number and dataset name, various audit record control and status flags, and the tape management system volume record or stacked file

dataset record for each dataset moved by Tape/Copy. An Audit Log record is written for each tape volume associated with a dataset.

The following types of records are written to the Audit Log file for each moved dataset:

- Tape management database volume records
- Tape management database dataset records
- Tape/Copy tape extract records

Example

If a single input tape dataset was contained on five volumes, the input Audit Log records written would be:

- 5 tape management system database volume records
- 1 tape management system database dataset record
- 1 Tape/Copy extract record

All of the Audit Log records in this example would contain the same date and time stamp, along with the same dataset name and the same original first input volser number.

Audit Log File Record Layout

An Assembler macro record layout for the Audit Log record is included in the TCAUDIT member of the Tape/Copy JCLLIB library. This record layout should provide enough information for someone with Assembler macro experience to write any custom programs for processing against the Tape/Copy Audit Log file.

Audit Log Report

The Audit Log Report lists the successful MOVE conversions performed by Tape/Copy. The format of the Audit Log Report is similar to that of the Tape/Copy Conversion Report.

Example

```
 REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0007

 DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     AUDIT LOG CONVERSION REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE      1

 DATE:  09/22/2002   TIME:  14:59:48     JOB:OTTCCONV #07368              INPUT FILE(S)-----------+ OUTPUT FILE(S)----------+
 DATASET NAME----------------------------+ LRECL  BLKSZE RETENTION TYPE VOLSER  SEQ STAT. BLK CNT VOLSER  SEQ STAT. BLK CNT

 OT.RMMRBV.DATA0004.MFMV.FILE01                 100   32000 2008.083       001042    1 UUC02       1 001054    1 UUC02       1

 OT.RMMRBV.DATA0004.MFMV.FILE02                 100   32000 2008.083       001042    2 CUC02       2 001054    2 UUC02       2
                                                                           001043    2

 OT.RMMRBV.DATA0004.MFMV.FILE03                 100   32000 2008.083       001043    3 CUC02       2 001054    3 UUC02       2
                                                                           001044    3

 OT.RMMRBV.DATA0004.MFMV.FILE04                 100   32000 2008.083       001044    4 CUC02       4 001054    4 UUC02       4
                                                                           001045    4

 OT.RMMRBV.DATA0004.MFMV.FILE05                 100   32000 2008.083       001045    5 CUC02       2 001054    5 UUC02       2

TAPES SUCCESSFULLY CONVERTED:  READ:       4     WRITTEN:       1     TOTAL FILES CONVERTED:       5
```

To generate an Audit Log Report, select option 4, “Audit Log Rpt” from Tape/Copy’s Primary Selection panel.

Warning Do not change the job name when resuming a conversion job (under the control of Tape/Copy’s the control of the Restart Manager). Different job names will cause the “Tape Successfully Converted/Written” to be wrong.

Note See Chapter 30 for more information on the ISPF panels used to generate the JCL that produces the Audit Log Report.

The Audit Log Report job also produces an Include/Exclude Filter Tables Report, which shows what inclusion and exclusion patterns/tables were in use when the job ran. See Chapter 9, for an example of this report.

Statistics File

The Tape/Copy Statistics file is a GDG based dataset that contains a running count of the number of datasets converted by Tape/Copy’s conversion jobs, by date. This file is summarized, compressed and reorganized each time the Tape Database Extract phase of Candidate Selection is performed. When the Statistics file is summarized, a Conversion Statistics Report is produced.

Note The Statistics file’s dataset name is defined by the STATISTICS-FILE-GDG-BASE-NAME parameter value plus the generation/version number (G0001V00) of the GDG, and it is dynamically created if it does not already exist (such as the first time Tape/Copy performs a conversion).

Conversion Statistics Report

The Conversion Statistics Report shows a daily summary of all of the Tape/Copy activity recorded in the Tape/Copy statistics file.

```
RELEASE x.x.x  PTF LEVEL x                                T A P E / C O P Y                  PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION STATISTICS REPORT FOR OPENTECH_SYSTEMS,_INC.                    PAGE      1

            9 TRACK+  +------------18 TRACK-------------+  +------------36 TRACK-------------+  +------------128 TRACK------------+
            NON-ATL+  +-----INPUT-----+ +-----OUTPUT----+  +-----INPUT-----+ +-----OUTPUT----+  +-----INPUT-----+ +-----OUTPUT----+
            NOCOMP-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+
CONVERSION  INPUT/    NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/   NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/   NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/
   DATE       OUTPUT      COMP     COMP     COMP     COMP      COMP     COMP     COMP     COMP      COMP     COMP     COMP     COMP

1997.148        2         0        0        2        0         0        0        0        0         0        0        0        0
  5/28/1997         0         0        0        0        0         0        0        0        0         0        0        0        0
1997.161        0         7        0        0        0         0        0        0        0         0        0        0        0
  6/10/1997         1         0        0        0        0         0        0        0        0         0        0        0        0
1997.162        1         8        0        7        0         0        0        0        0         0        0        0        0
  6/11/1997         2         0        0        0        0         0        0        0        0         0        0        0        0
      .
      .
      .
1998.156        0         3        0        0        0         0        0        0        0         0        0        0        0
  6/ 5/1998         1         0        0        0        0         0        0        0        0         0        0        0        0
1998.157        0        15        0        0        0         0        0        0        0         0        0        0        0
  6/ 6/1998         5         0        0        0        0         0        0        0        0         0        0        0        0
1998.158        0         8        0        0        0         0        0        0        0         0        0        0        0
  6/ 7/1998        10         0        0        0        0         0        0        0        0         0        0        0        0

GRAND TOTAL    12       221        0       30        0         0        0        0        0         0        0        0        0
                 177       135        0        0        0         0        0        0        0         0        0        0        0
```

Note This report can also be produced ‘stand alone’ by submitting the JCL in the STATSRPT member of the Tape/Copy JCLLIB library.

8 Parameter Hierarchy

TOPICS COVERED IN THIS CHAPTER

USERSETS and PGMSETS (page 8-2)

Parameter Summary Report (page 8-3)

USERSETS and PGMSETS

Tape/Copy is a parameter driven product. During the execution of each Tape/Copy job, Tape/Copy merges input parameters from three potential sources to obtain the parameters that will control the execution of the job.

Note All available Tape/Copy parameters are listed with their descriptions in the Tape/Copy "Parameter Reference Guide".

The three sources of input parameters are:

- **PGMSETS** - either a DD statement in the JCL, or read from the PGMSETS member of the Tape/Copy PARMLIB. When parameter values are changed on the ISPF panels, the parameters and values are listed in a PGMSETS DD in the generated job JCL. These values override the USERSETS and DEFAULT values.
- **USERSETS** - a member in the Tape/Copy PARMLIB that is used to make parameter updates to override the factory DEFAULT settings. The parameters added to USERSETS are generally ones that are common to each Tape/Copy job run and would not change often. Frequently, modified parameters should be updated through the ISPF panels or the PGMSETS DD.
- **DEFAULTS** - LOAD MODULE which contains the factory settings and default values for each parameter. If no overrides are found in PGMSETS or USERSETS, the default values are listed in FDRJCL. Use USERSETS and/or PGMSETS to override the default values.

Logically, parameter values are taken from the first source (PGMSETS, USERSETS, or DEFAULTS) in which they are found.

The format of the parameters and parameter values in PGMSETS, USERSETS, and DEFAULTS is the same.

Tape/Copy PARMLIB information can be browsed and updated using option "0 PARMLIB" on the Tape/Copy Primary Selection Panel, or by using ISPF EDIT.

Parameter Summary Report

Each Tape/Copy batch job step produces a Parameter Summary Report that lists every Tape/Copy parameter, the value of that parameter for that job step, and the source of the parameter value - PGMSETS, USERSETS, or FACTSETS and from which dataset the value was generated. Use the Parameter Summary Report to determine what parameter values were used for a particular Tape/Copy batch job. The Parameter Summary Report is written to the PARMSUMM DD statement.

The value of the PARAMETER-SUMMARY-REPORT parameter determines if Tape/Copy produces a Parameter Summary Report. The default value of the PARAMETER-SUMMARY-REPORT parameter is YES.

Sample Parameter Summary Report

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     PARAMETER SUMMARY REPORT FOR OPENTECH_SYSTEMS,_INC.                              PAGE      1

MEMBER: USERSETS WAS READ FROM DDNAME/DSN: OT.OTSCLM.OT11.TCPRMLIB
MEMBER: PGMSETS  WAS READ FROM DDNAME/DSN: PGMSETS
PARAMETER NAME----------------------------------+  SOURCE-+  EXECUTION TIME VALUE----------------------------+

AAUTO-INCLUDE-ALL-CYCLES                            DEFAULTS  NO
ABEND-VOLSER/SLOT-TRANSLATION-ERROR                 DEFAULTS  YES
ACCOUNT-NUMBER-LOCATION                             DEFAULTS  NONE
ACTIVE-ACS-SELECTION-TABLE                          DEFAULTS  ACSTABLE
ACTIVE-CO-LOCATION-TABLE                            DEFAULTS  NONE
ACTIVE-NEWNAME-TABLE                                DEFAULTS  NEWNAME
ACTIVE-PERIOD-DEFAULT-INDAYS                        DEFAULTS  5
ADVR-ROUTING-FILE-NAME                              DEFAULTS  NONE
ADVR-RECALL-DELAY-IN-MB-PER-SECOND                  DEFAULTS  10
ALLOCATE-LARGE-WORK-FILES-AS                        DEFAULTS  DASD
ALLOW-MISSING-INPUT-DATASET-VOLUME                  DEFAULTS  NO
ALLOW-NULL-RECFM-FOR-LABELED-TAPES                  DEFAULTS  NO
ALLOW-REBLOCKING-OF-UNBLOCKED-FILES                 DEFAULTS  NO
ALLOW-STACKING-WITHOUT-STACK-CNTL-FILE              USERSETS  YES
```

9 Candidate Selection

TOPICS COVERED IN THIS CHAPTER

Candidate Selection Phases (page 9-2)

Pre-Filtering Dataset Records (page 9-8)

Excluding Previously Selected Volsers (page 9-11)

Excluding Mounted Volumes (page 9-11)

Reports Created by Candidate Selection (page 9-12)

Optional Candidate Selection Changes (page 9-25)

Integration of Stack Group Processing into Candidate Selection Forecast (page 9-25)

Introduction

The process that Tape/Copy uses to determine which datasets to select for processing is referred to as Candidate Selection. The Candidate Selection process is invoked through the ISPF panels by selection of either the “Mass Copy” or “ACS Copy” option from the Tape/Copy Primary Selection panel, and is listed as PGM=OTTCCAND in the Tape/Copy JCL.

The Candidate Selection jobs select datasets as candidates and create the conversion JCL that can be used to move/copy the selected tapes. The generated conversion JCL must be submitted in order to perform a conversion.

The selection process is driven by the parameter values specified by default in the DEFAULTS load module, and by the parameter values set by the user in the USERSETS member of the Tape/Copy PARMLIB library and on the ISPF panels (the PGMSETS DD statement values).

Note Tape/Copy has many selection options so that the user can be very specific, or very broad, in their selection criteria to ensure that they only select the tapes they wish to copy.

This chapter explains the phases of the Candidate Selection process, how the user can bypass certain phases and will list the reports that are generated by this process.

For detailed information on the ISPF panel fields on the Mass Copy and ACS Copy panels, see Chapter 27 and Chapter 29, respectively.

Candidate Selection Phases

Though the Candidate Selection process is only a single JCL job step, it actually consists of three phases:

1. TMC Dump/Sort/Summarize
   - **a** Statistics Phase
   - **b** Tape Database Extract Phase
   - **c** Tape Database Sort Phase
   - **d** Tape Database Summarization Phase
   - **e** Expiration Date Determination Phase
   - **f** Dual Copy Identification Phase
   - **g** Pre-Edit/Pre-Filter Phase
2. Generation of Candidate Dataset File
3. Generation of Conversion JCL

As listed above, the TMC Dump/Sort/Summarize phase is further divided into sub-phases. As Tape/Copy completes each phase it issues a WTO message to notify the user. A message is also issued if any phase is bypassed at the user's request.

Warning If the user chooses to bypass one of the Candidate Selection phases, all of the phases before the bypassed phase are bypassed also.

TMC Dump/Sort/Summarize

The TMC Dump/Sort/Summarize phase of Candidate Selection performs several tasks. These tasks are explained in this section in the order that they are performed by the TMC Dump/Sort/Summarize phase of Candidate Selection. This phase also generates a Bad Media Report and/or a Lost Tape Volumes Report if there are any entries in the BADMEDIA or LOSTVOLS members of the Tape/Copy PARMLIB.

Note These reports are all optional and can be turned "on" (YES) or "off" (NO) using the related fields on the Candidate Job Parameters Panel.

To bypass the entire TMC Dump/Sort/Summarize phase of Candidate Selection (all of the sub-phases), the user can specify -

```
//BYPSCSEL DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

Statistics Phase

The Statistics phase reorganizes the Tape/Copy Statistics file (the GDG based dataset that contains summary information on the number of tapes copied by Tape/Copy on each given day). This phase also prints a copy of the Conversion Statistics Report.

This phase runs very quickly and it should not need to be bypassed, however the DD the user can use to bypass the Statistics phase is -

```
//BYPSSTAT DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

Tape Database Extract Phase

The Tape Database Extract phase creates a "dump" or extract file of the user's tape management system database. This extract file is named @DSPREFIX.TAPECOPY.TMCDUMP.

To bypass the Tape Database Extract phase, the user can specify -

```
//BYPSDUMP DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel. If this phase is bypassed, Tape/Copy will use the @DSPREFIX.TAPECOPY.TMCDUMP file that already exists from the previous Candidate Selection job rather than recreating a new one; reducing processing time.

When using DFSMSrmm as the tape management database, Tape/Copy executes EDGHSKP,parm='dateform(J) to create the extract file. Therefore, if the user already has the output file from a recent EDGHSKP job run, they can bypass this phase and provide Tape/Copy with the file name by specifying the following in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

```
//BYPSDUMP DD DSN=your.edghskp.file,DISP=SHR
```

Tape Database Sort Phase

The Tape Database Sort phase sorts the @DSPREFIX.TAPECOPY.TMCDUMP file (or the override dataset name specified by the user in the previous phase) to create the sorted work files that Tape/Copy will summarize in the next phase.

This phase should never be bypassed unless directed by Technical Support. If advised, to bypass the Tape Database Sort phase, the user can specify -

```
//BYPSSORT DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

Tape Database Summarization Phase

The Tape Database Summarization phase creates the @DSPREFIX.TAPECOPY.TMCDUMP.SUMMED file which contains the tape management database records converted into Tape/Copy's extract format.

To bypass the Tape Database Summarization phase, the user can specify -

```
//BYPSSUMM DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel. If this phase is bypassed, Tape/Copy will use the @DSPREFIX.TAPECOPY.TMCDUMP.SUMMED file that already exists from the previous Candidate Selection job rather than recreating a new one; reducing processing time.

Expiration Date Determination Phase

The Expiration Date Determination phase uses the retention information in the @DSPREFIX.TAPECOPY.TMCDUMP.SUMMED file to calculate expiration dates of datasets under Cycle Control, Catalog Control, Last Used Date Control and Expiration Date Control, as well as GDG datasets. This calculated expiration date information is placed in the @DSPREFIX.TAPECOPY.TMC.CEXPDT file.

To bypass the Expiration Date Determination phase, the user can specify -

```
//BYPSEXPD DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

This phase will also be bypassed if both the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter AND the GDG-EXPDT-DETERMINATION parameter are set to NO.

If the GDG-EXPDT-DETERMINATION parameter is set to YES but the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter is set to NO, Tape/Copy will calculate the expiration dates for GDG datasets only.

If the GDG-EXPDT-DETERMINATION parameter is set to NO but the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter is set to YES, Tape/Copy will calculate the expiration dates for Cycle Control, Catalog Control, Last Used Date Control and Expiration Date Control datasets only.

Note See Chapter 11 for more information on calculating expiration dates with Tape/Copy.

Dual Copy Identification Phase

The Dual Copy Identification phase uses the @DSPREFIX.TAPECOPY.TMCDUMP.SUMMED file to determine which datasets already have valid Dual Copy backups.

This phase is automatically bypassed for users without VDR authority.

Pre-Edit/Pre-Filter Phase

The Pre-Edit/Pre-Filter phase uses the @DSPREFIX.TAPECOPY.TMCDUMP.SUMMED file to create the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file. If no “pre-filtering” options have been selected by the user, the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file will be identical to the @DSPREFIX.TAPECOPY.TMCDUMP.SUMMED file. However, if the user has chosen to pre-filter the datasets by dataset name pattern, volser range or by dropping the scratched/deleted records, the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file will only contain the dataset records that have not been filtered out by the user’s filtering criteria.

Note See the Pre-Filtering Dataset Section later in this chapter for more information on Tape/Copy pre-filtering options.

To bypass the Pre-Edit/Pre-Filter phase, the user can specify -

```
//BYPSFILT DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel. If this phase is bypassed, Tape/Copy will use the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file that already exists from the previous Candidate Selection job rather than recreating a new one; reducing processing time.

Generation of Candidate Dataset File

The Generation of Candidate Dataset File phase of Candidate Selection uses the work files created by the TMC Dump/Sort/Summarize phase to determine which datasets should be selected as candidates based on the user's criteria.

In this phase, Tape/Copy generates a report called the Candidate Dataset Listing report that shows all of the datasets that were selected. If the user has specified a Co-Location table to be used, a Co-Location Table Report is produced. A Dataset Rejection Report is also generated as a means of telling the user which datasets where not selected, and why they were not selected. A Dataset Rejection Summary Report is also generated to list the total number of datasets rejected with a given rejection message.

Note These reports are all optional and can be turned "on" or "off" using the related fields on the Candidate Job Parameters Panel.

To bypass the Generation of Candidate Dataset File phase of Candidate Selection, the user can specify -

```
//BYPSGCDF DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

Note By default, if no candidates are selected by the Candidate Selection process, the job ends with a condition code of zero. The CANDIDATE-SELECTION-CC-WHEN-NO-DATASETS-SELECTED parameter can be used to cause a non-zero condition code setting.

Generation of Conversion JCL

The Generation of Conversion JCL phase creates Conversion job JCL that can be used to copy/move the datasets selected by the Generation of Candidate Dataset File phase.

In this phase, Tape/Copy generates the Tape Pre-Pull List Reports which provide a summarized listing of the volsers scheduled to be converted by the Conversion JCL that was created. The Tape Pre-Pull List Report can also be set to list the slot number outcode for the volsers using the LIST-LOCATION-INFO-ON-PRE-PULL-REPORT parameter. The individual Tape Pre-Pull List reports are generated one per conversion job, but a Master Pull List is also available that list all of the volsers selected for conversion by the candidate selection job.

This phase also produces a Tape Conversion Forecast Report, which can help the user estimate the output tape requirements of each conversion job, and a Tape Conversion Forecast Detail Report that shows which datasets will be converted by each conversion job.

Note These reports are all optional and can be turned “on” or “off” using the related fields on the Candidate Job Parameters Panel.

To bypass the Generation of Conversion JCL phase of Candidate Selection, the user can specify -

```
//BYPSGCVJ DD DUMMY
```

in the Candidate Job Restart DD Statement field at the bottom of the Candidate Job Parameters Panel.

Pre-Filtering Dataset Records

In order to reduce the size of some of Tape/Copy's work files and speed up Candidate Selection processing, Tape/Copy offers a means of "pre-filtering" records out of some of the selection sub-phases in the TMC Dump/Sort/Summarize phase to improve processing time.

The following pre-filtering options are available by setting the related fields on the Candidate Job Parameters Panel:

- Pre-Filter Scratches
- Pre-Filter Tape Volser Range
- Pre-Filter Dataset Names
- Pre-Filter Dataset Names/Creation Job

The records that are pre-filtered out of the work files are not tracked on the Dataset Rejection Report, but are still included in the totals on the Dataset Rejection Summary Report.

Pre-Filter Scratches

The Pre-Filter Scratches option has four valid settings that allow users to filter records out of the Tape/Copy work files in various sub-phases of the TMC Dump/Sort/Summarize phase.

Note IF and WHEN the records are filtered is dependent upon which tape management system the user has and what values they have specified for the Pre-Filter Scratches field on the Candidate Job Parameters Panel.

The filtering performed by Pre-Filter Scratches can drop (again, based on the user's tape management system and their parameter settings):

- records that are in Scratch or Delete status
- records with the first byte of x='00' in the dataset name field
- records with the Creating Unit or Creating UCB set to hex zeros
- records with a Creating Stepname equal to the value of the INPUT-CREATING-STEPNAME-VALUE, which is set to OPENTECH by default (as they have already been converted by Tape/Copy)
- records that were created before the maximum days since creation, as set by the user on the Candidate Selection Panel

For ALL tape management systems:

If Pre-Filter Scratches is set to **NO**, then no pre-filtering of the record types above is performed. All of the records matching the above criteria will be passed on to the Generation of Candidate Dataset File phase where they will later be rejected and printed to the Dataset Rejection Report.

If Pre-Filter Scratches is set to **YES**, then Tape/Copy will drop the following records during the **Pre-Edit/Pre-Filter phase**:

- records that are in Scratch or Delete status
- records with the first byte of x=’00’ in the dataset name field
- records with the Creating Unit or Creating UCB set to hex zeros
- records with a Creating Stepname equal to the value of the INPUT-CREATING-STEPNAME-VALUE, which is set to OPENTECH by default (as they have already been converted by Tape/Copy)

Additional Options for CA-1 and DFSMSrmm users ONLY:

Users with these tape management systems have additional options for Pre-Filtering Scratches that will allow Tape/Copy to filter out undesirable records earlier in the selection process to further reduce the size of the work file that gets passes on to the Generation of Candidate Dataset File phase and further improve processing time.

If Pre-Filter Scratches is set to **ENHANCED**, then Tape/Copy will drop the following records during the **Tape Database Extract** or **Tape Database Sort phase**:

- records that are in Scratch or Delete status
- records with the first byte of x=’00’ in the dataset name field
- records with the Creating Unit or Creating UCB set to hex zeros
- records with a Creating Stepname equal to the value of the INPUT-CREATING-STEPNAME-VALUE, which is set to OPENTECH by default (as they have already been converted by Tape/Copy)

If Pre-Filter Scratches is set to **CDTENH**, then Tape/Copy will drop the following records during the **Tape Database Extract** or **Tape Database Sort phase**:

- records that are in Scratch or Delete status
- records with the first byte of x=’00’ in the dataset name field
- records with the Creating Unit or Creating UCB set to hex zeros
- records with a Creating Stepname equal to the value of the INPUT-CREATING-STEPNAME-VALUE, which is set to OPENTECH by default (as they have already been converted by Tape/Copy)
- records that were created before the maximum days since creation, as set by the user on the Candidate Selection Panel

Pre-Filter by Volser Range

If the user chooses to pre-filter by tape volser range, volsers that are not included in the tape range defined by the Volser Range fields on the Candidate Selection Panel, included in the INCLVOLS member of the Tape/Copy PARMLIB library (or other volser inclusion list specified by the user for this Candidate Selection job) are dropped from Tape/Copy work files in the Pre-Edit/Pre-Filter phase of Candidate Selection. Tape/Copy will also drop any records for volsers that are in the EXCLVOLS member of the Tape/Copy PARMLIB library (or other volser exclusion pattern specified by the user for this Candidate Selection job).

Since these tape volsers are filtered out of the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file, they are not passed to the Generate Candidate Dataset File phase of the process and will not appear on the Dataset Rejection Report.

Pre-Filter by Dataset Names

If the user chooses to pre-filter by dataset name, datasets that are not included in the INCLDSNS member of the Tape/Copy PARMLIB library (or other dataset inclusion pattern specified by the user for this Candidate Selection job) are dropped from Tape/Copy work files in the Pre-Edit/Pre-Filter phase of Candidate Selection. Tape/Copy will also drop any records that are in the EXCLDSNS member of the Tape/Copy PARMLIB library (or other dataset exclusion pattern specified by the user for this Candidate Selection job).

Since these datasets are filtered out of the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file, they are not passed to the Generate Candidate Dataset File phase of the process and will not appear on the Dataset Rejection Report.

Pre-Filter by Dataset Name/Creation Job

If the user chooses to pre-filter by the dataset name/creation job name combination, datasets that are not included in the INCLDSCJ member of the Tape/Copy PARMLIB library (or other dataset/creation job name inclusion pattern specified by the user for this Candidate Selection job) are dropped from Tape/Copy work files in the Pre-Edit/Pre-Filter phase of Candidate Selection. Tape/Copy will also drop any records that are in the EXCLDSCJ member of the Tape/Copy PARMLIB library (or other dataset/creation job name exclusion pattern specified by the user for this Candidate Selection job).

Since these datasets are filtered out of the @DSPREFIX.TAPECOPY.TMCDUMP.FILTERED file, they are not passed to the Generate Candidate Dataset File phase of the process and will not appear on the Dataset Rejection Report.

Excluding Previously Selected Volsers

By default, Tape/Copy will select all datasets matching the user's criteria each time the Candidate Selection job is run. Which means that if the user runs a Candidate Selection job to generate conversion JCL for a group of tapes, then runs another Candidate Selection job again before all of the Conversion jobs have completed, the same datasets may be reselected and added to additional Conversion jobs.

For users that run frequent Candidate Selection jobs or often run another Candidate Selection before the conversion jobs generated by the previous Candidate Selection job, Tape/Copy has the option to exclude datasets that have been selected by a previous Candidate Selection job. This feature is controlled by using the EXCLUDE-PREVIOUSLY-SELECTED-FILES parameter.

If the user chooses to exclude datasets previously selected as candidates by a previous Candidate Selection job, a Tape/Copy work dataset will be created that contains a list of previously selected datasets. The dataset is named @dsprefix.TAPECOPY.EXCLPREV.SELECTED.

The EXCLUDE-PREVIOUSLY-SELECTED-FILES parameter accepts the following values:

- YES - indicates that the previously selected files will be excluded and the list of previously selected datasets will be updated with datasets currently selected.
- NO - indicates that the previously selected files will not be excluded and the list of previously selected datasets will not be updated with datasets currently selected.
- NEW - indicates that the list of previously selected datasets will be emptied prior to checking for previously selected datasets, and then updated to include all datasets currently selected.

During candidate selection, if EXCLUDE-PREVIOUSLY-SELECTED-FILES is set to YES and Tape/Copy identifies a candidate that has already been selected by a previous job the dataset will be rejected with message M0311 xxx vvvvvv PREVIOUSLY SELECTED FILE.

Excluding Mounted Volumes

Tape/Copy will detect tape volumes that are mounted and reject any datasets that were selected as candidates but reside on tape volumes that are mounted in order to prevent processing datasets that are most likely to change from the time they were selected as candidate, to the time that the conversion jobs run to process those datasets. If part of a multi-volume set, the datasets on the entire volume set will be rejected. The rejection message used for the rejection is M0094 DATASET IS SPECIFICALLY EXCLUDED BY VOLSER. Volumes that are bypassed because they were mounted and in use by another job during Candidate Selection will also be listed on the Include/Exclude Filter Tables Report under table name EXCLMNTV.

Reports Created by Candidate Selection

The following reports are generated by the Candidate Selection process unless the user opts not to produce them using a user parameter or by changing the ISPF panel field for that report to NO, or unless otherwise noted. (Not listed here, but also produced by every Tape/Copy job is the Parameter Summary Report described in Chapter 8.)

- Conversion Statistics Report
- Bad Media Report
- Lost Tape Volumes Report
- Calculated Expiration Date Report
- Include/Exclude Filter Tables Report
- Candidate Dataset Listing Report
- Data Set Rejection Report
- Data Set Rejection Summary Report
- Tape Pre-Pull List Reports
- Reblocking Status Report
- Rules Processor Report
- Tape Conversion Forecast Report
- Tape Conversion Forecast Detail Report

Conversion Statistics Report

The Conversion Statistics Report shows a daily summary of all of the Tape/Copy activity recorded in the Tape/Copy statistics file.

```
RELEASE x.x.x  PTF LEVEL x                                T A P E / C O P Y                                PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION STATISTICS REPORT FOR OPENTECH_SYSTEMS,_INC.                    PAGE      1

            9 TRACK+  +------------18 TRACK-------------+  +------------36 TRACK-------------+  +-----------128 TRACK------------+
            NON-ATL+  +-----INPUT-----+ +-----OUTPUT----+  +-----INPUT-----+ +-----OUTPUT----+  +----INPUT-----+ +-----OUTPUT----+
            NOCOMP-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+
CONVERSION   INPUT/    NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/   NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/   NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/
   DATE       OUTPUT      COMP     COMP     COMP     COMP      COMP     COMP     COMP     COMP      COMP     COMP     COMP     COMP

1997.148         2         0        0        2        0         0        0        0        0         0        0        0        0
  5/28/1997        0         0        0        0        0         0        0        0        0         0        0        0        0
1997.161         0         7        0        0        0         0        0        0        0         0        0        0        0
  6/10/1997        1         0        0        0        0         0        0        0        0         0        0        0        0
1997.162         1         8        0        7        0         0        0        0        0         0        0        0        0
  6/11/1997        2         0        0        0        0         0        0        0        0         0        0        0        0
      .
      .
      .
1998.156         0         3        0        0        0         0        0        0        0         0        0        0        0
  6/ 5/1998        1         0        0        0        0         0        0        0        0         0        0        0        0
1998.157         0        15        0        0        0         0        0        0        0         0        0        0        0
  6/ 6/1998        5         0        0        0        0         0        0        0        0         0        0        0        0
1998.158         0         8        0        0        0         0        0        0        0         0        0        0        0
  6/ 7/1998       10         0        0        0        0         0        0        0        0         0        0        0        0

GRAND TOTAL     12       221        0       30        0         0        0        0        0         0        0        0        0
                177       135        0        0        0         0        0        0        0         0        0        0        0
```

Note This report can also be produced ‘stand alone’ by submitting the JCL in the STATSRPT member of the Tape/Copy JCLLIB library.

Bad Media Report

The Bad Media Report provides a list of the tape volumes that Tape/Copy has encountered and recorded that have caused bad media errors during Tape/Copy conversion jobs. Tape/Copy places these volsers and other abend information into the BADMEDIA member of the Tape/Copy PARMLIB library and will automatically exclude those volsers in further processing. When the BADMEDIA report is being produced, each volume contained within the BADMEDIA parmlib member will be checked against the TMC, volumes with datasets created after the date listed in the BADMEDIA entries will be declared obsolete and will be removed from the BADMEDIA parmlib member.

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y                  PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     BAD MEDIA REPORT FOR NONE                                          PAGE      1
         ABEND      REASON
VOLSER     CODE       CODE       DATE       TIME      STATUS
X01045  S001/U0000  00000413  10/12/2001  11:50:08
X01031  S001/U0000  00000413  10/12/2001  12:21:30
X01040  S001/U0000  00000413  02/19/2002  16:40:46
X01047  S001/U0000  00000413  02/19/2002  16:42:25
X00042  S001/U0000  00000413  04/07/2004  09:45:28
X00069  S001/U0000  00000413  04/07/2004  09:46:15
X00003  S001/U0000  10000413  05/05/2004  14:27:19
ETQ054  S000/U0242  00000020  09/29/2008  16:00:12
ETQ050  S000/U0242  00000020  10/31/2008  09:10:12
ETQ186  S000/U0242  00000020  08/29/2008  14:10:12 **OBSOLETE**
```

If a tape volume that is listed on this report is no longer considered “bad media”, the table entry for that volser may be manually deleted from the BADMEDIA member by the user so that it is no longer excluded from processing.

Lost Tape Volumes Report

The Lost Tape Volumes Report provides a list of the tape volumes in the LOSTVOLS member of the Tape/Copy PARMLIB library. The LOSTVOLS member is maintained by the user. Tape/Copy will automatically exclude these lost volsers from processing.

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y                  PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx    LOST VOLUMES REPORT FOR OPENTECH_SYSTEMS,_INC.                        PAGE
1

001038
A00345
056985
098627
123896
789510
```

If a tape volume that has been previously added to this member has been located, the table entry for that volser can be deleted from the LOSTVOLS member by the user so that it is no longer excluded from processing.

Calculated Expiration Date Report

The Calculated Expiration Date Report is produced if the user has chosen to allow Tape/Copy to calculate the expiration date of GDG datasets and/or datasets under Cycle Control, Catalog Control, Last Used Date control and Expiration Date control.

Note See Chapter 11 for more information on using Tape/Copy's Calculated Expiration Date feature.

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTCCAND


DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CALCULATED EXPIRATION DATE REPORT FOR OPENTECH_SYSTEMS,_INC.                    PAGE      1

 CYCLE OPTIONS: CDAY_OPTION: TAPE CJOB_OPTION: DSN

 JOB NAME                 DATASET NAME                 FIRST  FILE     CREATE  LAST USED RETENTION  COMPUTED  INFORMATIONAL MESSAGES
 +------+ +----------------------------------------+ VOLSER +SEQ + +-DATE--+ +-DATE--+ +--TYPE--+ +EXPDATE+ +---------------------+

 OINPTB2A OT.APPLA.DATA0001.SFSV.DATASET               001000      1  2002.268  2002.268 CYCLE/_12€ --------- INSUFF CYCLES TO CALC
 ---------------------------------------------------------------------------------------------------------------------------------
 OINPTB2A OT.APPLA.DATA0008.SFSV.GDG.G0001V00          001025      1  2002.268  2002.268 CYCLE/_05€ --------- INSUFF CYCLES TO CALC
 OINPTB2A OT.APPLA.DATA0008.SFSV.GDG.G0002V00          001026      1  2002.268  2002.268 CYCLE/_05€ --------- INSUFF CYCLES TO CALC
 OINPTB2A OT.APPLA.DATA0008.SFSV.GDG.G0003V00          001027      1  2002.268  2002.268 CYCLE/_05€ --------- INSUFF CYCLES TO CALC
 ---------------------------------------------------------------------------------------------------------------------------------


REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTCCAND


DATE:  xx/xx/xxxx   TIME:  xx:xx:xx    CALCULATED EXPIRATION DATE REPORT FOR OPENTECH_SYSTEMS,_INC.                     PAGE      2

 CYCLE OPTIONS: CDAY_OPTION: TAPE CJOB_OPTION: DSN

 JOB NAME                 DATASET NAME                 FIRST  FILE     CREATE  LAST USED RETENTION  COMPUTED  INFORMATIONAL MESSAGES
 +------+ +----------------------------------------+ VOLSER +SEQ + +-DATE--+ +-DATE--+ +--TYPE--+ +EXPDATE+ +---------------------+

 TOTAL CATLG CTRL DATASETS ================>              0
 TOTAL CYCLE CTRL DATASETS ================>              4
 TOTAL LDATE CTRL DATASETS ================>              0
 TOTAL OTHER CTRL DATASETS ================>            321
 TOTAL RECORDS READ =======================>            325
 TOTAL RECORDS WRITTEN ====================>            325
```

Note This report can also be produced 'stand alone' by submitting the JCL in the BLDCEXPF member of the Tape/Copy JCLLIB library.

Include/Exclude Filter Tables Report

The Include/Excluded Filter Tables Report is provided to help both Technical Support staff and the user identify what inclusion and exclusion patterns/tables were in use when the Tape/Copy job ran. The report lists which inclusions and exclusions were in use by each phase of the job that uses that type of selection criteria.

The EXCLMNTV table lists any volumes that were rejected because the volume (or a volume in the same multi-volume set) was mounted when the candidate selection was in process. Datasets residing on these volumes are rejected.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     INCLUDE/EXCLUDE FILTER TABLES REPORT FOR OPENTECH_SYSTEMS,_INC.             PAGE      1

PROCESSING PHASE     TBL NAME LEN FILTER DATA
+------------------+ +------+ +-+ +-------------------------------------------------------------------------------------+
PRE-SELECTION        INCLVOLS     <<<<<  NO ENTRIES  >>>>>

                     EXCLVOLS     <<<<<  NO ENTRIES  >>>>>

                     INCLDSNS     <<<<<  NO ENTRIES  >>>>>

                     EXCLDSNS   4 DMS/

CANDIDATE SELECTION  INCLDSNS     <<<<<  NO ENTRIES  >>>>>

                     EXCLDSNS   4 DMS/

                     INCLVOLS     <<<<<  NO ENTRIES  >>>>>

                     EXCLVOLS     <<<<<  NO ENTRIES  >>>>>

                     INCLACT#     <<<<<  NO ENTRIES  >>>>>

                     EXCLACT#     <<<<<  NO ENTRIES  >>>>>

                     INCLDTYP     <<<<<  NO ENTRIES  >>>>>

                     EXCLDTYP     <<<<<  NO ENTRIES  >>>>>

                     INCLVNDR     <<<<<  NO ENTRIES  >>>>>

                     EXCLVNDR     <<<<<  NO ENTRIES  >>>>>

                     INCLOUTC   6 <NULL>
                                6 <#LIB>
                                6 <#VMS>

                     EXCLOUTC     <<<<<  NO ENTRIES  >>>>>

                     INCLCRJB     <<<<<  NO ENTRIES  >>>>>

                     EXCLCRJB     <<<<<  NO ENTRIES  >>>>>

                     INCLCRPG     <<<<<  NO ENTRIES  >>>>>

                     EXCLCRPG     <<<<<  NO ENTRIES  >>>>>

                     INCLCRSN     <<<<<  NO ENTRIES  >>>>>

                     EXCLCRSN     <<<<<  NO ENTRIES  >>>>>

                     EXCLMNTV   6 000066

                     INCLDSCJ     <<<<<  NO ENTRIES  >>>>>

                     EXCLDSCJ     <<<<<  NO ENTRIES  >>>>>
```

Note The Include/Exclude Filter Tables Report is also produced by other Tape/Copy jobs, including the SETUP job and the Auditlog Report job.

Pre-Edit/Pre-Filter Report

The Pre-Edit/Pre-Filter Report is provided to help identify reasons records are discarded through the “Pre-Filtering Dataset Records” phase of the Candidate Selection process. The report lists each pre-filtering “test” in the order they are performed and will list the number of records discarded by each filtering test.

Even though a record may meet filtering criteria for more than one filtering test, each record will only appear under one of the “reasons for being discarded”. The tests are performed in the order they are listed so the first test to discard a record is the item the discarded record will be added to.

For example, if the record would have been filtered out because it did match the INCLDSNS or the INCLVOLS criteria, it would be tallied in the total for the VOLSER INCLUSION because that test is performed before DSN INCLUSION.

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     PRE-EDIT/PRE-FILTER REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE      1


                                     FILES      VOLUMES
+-----------------------------+ +---------+ +---------+

INPUT STATISTICS                        835         510
OUTPUT STATISTICS                        13          34

REJECTION TOTALS:                       822         476


SCRATCH STATUS                            0           0
DELETE STATUS                             0           0
UNUSED TMC ENTRY                          0           0
DSN ALREADY MOVED                         0           0
BROKEN VOLSER CHAIN                       0           0
VOLSER OUTSIDE RANGE                     18           5
VOLSER INCLUSION                          0           0
VOLSER EXCLUSION                          0           0
EXCLUDED DUE TO INUSE                     8           3
BAD MEDIA EXCLUSION                       0           0
LOST VOLUME EXCLUSION                     0           0
DSN INCLUSION                             0           0
DSN EXCLUSION                             0           0
DSN/CRJOB INCL/EXCL                       0           0
CREATION JOBNAME INCL                     0           0
CREATION JOBNAME EXCL                     0           0
CREATION PGMNAME INCL                     0           0
CREATION PGMNAME EXCL                     0           0
CREATION SYSNAME INCL                     0           0
CREATION SYSNAME EXCL                     0           0
PREVIOUSLY SELECTED                       0           0
NOT VDR ORIGINAL                        796         468
ALREADY HAS VDR BACKUP                    0           0
```

The detail lines and descriptions are listed on the next page.

Detail Line Descriptions

INPUT STATISTICS	Number of records that were input to the Pre-filtering process
OUTPUT STATISTICS	Number of records that were output from the Pre-filtering process
SCRATCH STATUS	Number of records discarded as being in SCRATCH status in the TMC
DELETE STATUS	Number of records discarded as being in DELETE status in the TMC
UNUSED TMC ENTRY	Number of records discarded because the TMC record contains binary zeros in place of a dataset name and creating unit.
DSN ALREADY MOVED	Number of records discarded because they have already been moved by Tape/Copy.
BROKEN VOLSER CHAIN	Number of records discarded because the volser chain information is incorrect
VOLSER OUTSIDE RANGE	Number of records discarded for being outside of the volser range specified in the INPUT-TAPE-STARTING-VOLSER and INPUT-TAPE-ENDING-VOLSER parameters.
VOLSER INCLUSION	Number of records discarded because the volume did not match a record or volser range listed in the INCLVOLS member, and the PRE-SELECT-VOLSER-RANGE was not set to NO.
VOLSER EXCLUSION	Number of records discarded because the volume matched a record or volser range listed in the EXCLVOLS member, and the PRE-SELECT-VOLSER-RANGE was not set to NO.
EXCLUDED DUE TO INUSE	Number of records discard because the volume was already in use.
BAD MEDIA EXCLUSION	Number of records discarded because the volser matched a volser in the BADMEDIA member.
LOST VOLUME EXCLUSION	Number of records discarded because the volser matched a volser in the LOSTVOLS member.
DSN INCLUSION	Number of records discarded because the dataset name did not match a dataset name or pattern listed in the INCLDSNS member, and the PRE-SELECT-DATASET-NAMES was not set to NO.
DSN EXCLUSION	Number of records discarded because the dataset name matched a dataset name or pattern listed in the EXCLDSNS member, and the PRE-SELECT-DATASET-NAMES was not set to NO.

DSN/CRJOB INCL/EXCL	Number of records discarded because the dataset name and creating job name of the record did not match a dataset name and creating job name listed in the INCLDSCJ member, or the dataset name and creating job name of the record matched a dataset name and creating job name listed in the EXCLDSCJ member, and the PRE-SELECT-DATASET-NAME/CREATION-JOB was not set to NO.
CREATION JOBNAME INCL	Number of records discarded because the creating job name did not match a creating job name or pattern listed in the INCLCRJB member.
CREATION JOBNAME EXCL	Number of records discarded because the creating job name matched a creating job name or pattern listed in the EXCLCRJB member.
CREATION PGMNAME INCL	Number of records discarded because the creating program name did not match a creating program name or pattern listed in the INCLCRPG member.
CREATION PGMNAME EXCL	Number of records discarded because the creating program name matched a creating program name or pattern listed in the EXCLCRPG member.
CREATION SYSNAME INCL	Number of records discarded because the creating system name did not match a creating system name or pattern listed in the INCLCRSN member.
CREATION SYSNAME EXCL	Number of records discarded because the creating system name matched a creating system name or pattern listed in the EXCLCRSN member.
PREVIOUSLY SELECTED	Number of records discarded because the dataset name matched an entry in the @dsprefix.TAPECOPY.EXCLPREV.SELECTED file and execution parameter EXCLUDE-PREVIOUSLY-SELECTED-FILES was set to YES and PRE-EDIT-REJECTIONS was set to a value other than NO.
NOT VDR ORIGINAL (VDR users only)	Number of records discarded because the dataset is not the matching original to a VDR backup, and execution parameter PERFORM-DUALCOPY-PROCESSING was set to YES and PRE-EDIT-REJECTIONS was set to a value other than NO.
ALREADY HAS VDR BACKUP (VDR users only)	Number of records discarded because the dataset already has a VDR Dual Copy backup, and execution parameter PERFORM-DUALCOPY-PROCESSING was set to YES and PRE-EDIT-REJECTIONS was set to a value other than NO.

Candidate Dataset Listing Report

The Candidate Data Set Listing Report provides a listing of all tape datasets that meet the criteria specified by the user. These are the datasets that Tape/Copy has identified as candidates for conversion. At the bottom of the report, a summary of tapes selected is provided for review.

```
RELEASE x.x.x  PTF LEVEL x                                T A P E / C O P Y                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CANDIDATE DATA SET LISTING FOR OPENTECH_SYSTEMS,_INC.                      PAGE      1

                                          FIRST  FILE   VOL                                          TAPE COMPRESSION CATALOG
DATA SET NAME                             VOLSER  SEQ  COUNT   ATL ID   RETENTION TYPE  MEGABYTES TRACKS   STATUS    STATUS

ASMLNK.ASMLNK99.TESTSYS.G0018V00          068720    1     2             1995.273          142.367    18     UNCOMP   UNCATLG
ASMLNK.ASMLNK99.TESTSYS.G0019V00          055467    1     2             1995.301          140.663    18       COMP     CATLG
ASMLNK.ASMLNK99.TESTSYS.MERGED.G0020V00   059654    1     2             1995.273          146.453    18       COMP     CATLG
ASMLNK.ASMLNK99.TESTSYS.MERGED.G0021V00   062257    1     2             1995.301          143.506    18     UNCOMP   UNCATLG
ASMLNK.ASMLNK99.TESTSYS.MUFI.G0019V00     068698    1     3             1995.273          506.004    18     UNCOMP   UNCATLG
ASMLNK.ASMLNK99.TESTSYS.MUFI.SRT          055752    1     2             1996.062          279.331    18     UNCOMP   UNCATLG
.       .       .       .
.       .       .       .
OT01.EXTRACT.MUP.SRT.G0926V00             058731    1     3   0000      CYCLE/0000012     532.319    18     UNCOMP   UNCATLG
OT01.EXTRACT.MUP.SRT.G0927V00             033887    1     3   0001      CYCLE/0000012     528.775    18     UNCOMP   UNCATLG
OT01.EXTRACT.MUP.SRT.G0928V00             064251    1     3   0000      CYCLE/0000012     529.035    18     UNCOMP   UNCATLG
PROD.CAN.PRODCAN7.PROD.OCH161.G0007V00    060412    1     5   0002      CATALOG CNTL    1,097.378    18     UNCOMP   UNCATLG
PROD.CAN.PRODCAN9.PROD.UCH177.G0007V00    079403    1     2   0002      CATALOG CNTL      224.584    18     UNCOMP   UNCATLG
PROD.MSAS.AR40.TC2V1.G0051V00             043702    1     3   0002      CYCLE/0000012     354.125    18     UNCOMP   UNCATLG
PROD.MSAS.AR40.TC2V1.G0052V00             061501    1     3   0002      CYCLE/0000012     354.131    18     UNCOMP   UNCATLG
TEST.TSTMSTR.MTHLY.BKUP.UP0001.G0006V00   033182    1     2   0002      1996.206          242.031    18     UNCOMP   UNCATLG

TAPE/COPY JOB HAS IDENTIFIED:  +-----------NON ATL-----------+ +-------------ATL-------------+ +------------TOTAL------------+
                               UNCOMPRESSED  COMPRESSED  TOTAL UNCOMPRESSED  COMPRESSED  TOTAL UNCOMPRESSED  COMPRESSED  TOTAL
          18-TRACK DATA SETS:         482           0    482        306           0    306        788           0    788
          36-TRACK DATA SETS:           0           0      0          0           0      0          0           0      0
         128-TRACK DATA SETS:           0           0      0          0           0      0          0           0      0
              REEL DATA SETS:          27         N/A     27        N/A         N/A    N/A         27         N/A     27
                      TOTALS:         509           0    509        306           0    306        815           0    815

TAPE/COPY JOB HAS IDENTIFIED:  +-----------NON ATL-----------+ +-------------ATL-------------+ +------------TOTAL------------+
                               UNCOMPRESSED  COMPRESSED  TOTAL UNCOMPRESSED  COMPRESSED  TOTAL UNCOMPRESSED  COMPRESSED  TOTAL
         18-TRACK CARTRIDGES:       1,601           0  1,601      1,347           0  1,347      2,948           0  2,948
         36-TRACK CARTRIDGES:           0           0      0          0           0      0          0           0      0
        128-TRACK CARTRIDGES:           0           0      0          0           0      0          0           0      0
                       REELS:          54         N/A     54        N/A         N/A    N/A         54         N/A     54
                      TOTALS:       1,655           0  1,655      1,347           0  1,347      3,002           0  3,002
```

Data Set Rejection Report

The Data Set Rejection Report is a very useful tool for problem determination. This report provides a listing of each volser (except for those that have been pre-filtered out of the Tape/Copy work files earlier in the selection process) that was not selected as a candidate for conversion based on the user's criteria, and the reason that it was not selected.

Note Explanations of the Tape/Copy rejection message codes can be found in the Tape/Copy "Messages & Codes Guide".

Tape/Copy provides the user with a means of tailoring this report so that they can produce the entire report or only produce a report showing the volsers rejected with the rejection reason codes the user specifies. This ability is controlled by the BYPASS-REJECTION-MESSAGE-PROCESSING parameter. There is no ISPF panel field to control this parameter, so if the user wants to override its value the parameter and override must be placed in the USERSETS member of the Tape/Copy PARMLIB.

If the BYPASS-REJECTION-MESSAGE-PROCESSING parameter is set to **NO** (the default), the full Dataset Rejection Report is generated.

If the BYPASS-REJECTION-MESSAGE-PROCESSING parameter is set to **YES**, the Dataset Rejection Report is not generated.

If the BYPASS-REJECTION-MESSAGE-PROCESSING parameter is set to **INCLUDE**, the Dataset Rejection Report will only include volsers rejected with the rejection messages that the user identified in the INCLMSGS member of the Tape/Copy PARMLIB library.

If the BYPASS-REJECTION-MESSAGE-PROCESSING parameter is set to **EXCLUDE**, the Dataset Rejection Report will include all volsers rejected except those rejected with the rejection messages that the user identified in the EXCLMSGS member of the Tape/Copy PARMLIB library.

```
RELEASE x.x.x  PTF LEVEL x                                T A P E / C O P Y                  PROGRAM OTTCCAND

DATE:  xx/xx/xxxx  TIME:  xx:xx:xx    DATA SET REJECTION REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE   1

MSGID  DATA SET NAME                                 VOLSER  REJECTION REASON

M0005  TEST.BACKUP.CLO090                           033537  DATASET IS EXTERNALLY MANAGED
M0004  TEST.CAN.TESTCAN7.PROD.OCH161.G0006V00       043238  TAPE IS IN SCRATCH STATUS
M0004  TEST.CAN.TESTCAN7.PROD.OCH161.G0007V00       060413  TAPE IS IN SCRATCH STATUS
M0004  TEST.CAN.TESTCAN9.PROD.UCH177.G0007V00       079404  TAPE IS IN SCRATCH STATUS
M0031  TEST.MSAS.AR40.TC2V1.G0041V00                064408  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0042V00                052311  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0043V00                045941  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0044V00                069438  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0045V00                043048  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0046V00                049799  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0047V00                066477  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0048V00                059972  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0049V00                063649  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0050V00                060885  TAPE DATASET IS OUT OF AREA
M0031  TEST.MSAS.AR40.TC2V1.G0051V00                043703  TAPE DATASET IS OUT OF AREA
M0043  TEST.TESTINC6.PROD.LCH099.G0034V00           079752  SINGLE VOLUME TAPE DATASET IS EXPLICITLY EXCLUDED
M0043  TEST.TESTINC7.PROD.OCH100.G0034V00           079788  SINGLE VOLUME TAPE DATASET IS EXPLICITLY EXCLUDED
M0043  TEST.TESTINC9.PROD.UCH102.G0034V00           032178  SINGLE VOLUME TAPE DATASET IS EXPLICITLY EXCLUDED
```

Data Set Rejection Summary Report

The Data Set Rejection Summary Report provides a summary of the rejection reasons produced by the Data Set Rejection Report and shows how many volsers were rejected for each of the rejection reasons listed. These totals include the number of volsers that were pre-filtered and not included in the detailed listing of the Dataset Rejection Report.

```
RELEASE x.x.x  PTF LEVEL x                                T A P E / C O P Y                  PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DATA SET REJECTION SUMMARY REPORT FOR OPENTECH_SYSTEMS,_INC.

MSGID  MESSAGE COUNT  REJECTION REASON

M0002        6,128    RECORD IS AN UNUSED TAPE DATABASE ENTRY
M0003           89    TAPE IS IN DELETE STATUS
M0004        2,742    TAPE IS IN SCRATCH STATUS
M0005          998    DATASET IS EXTERNALLY MANAGED
M0007          839    DATASET IS SPECIFICALLY EXCLUDED BY DATASET NAME
M0018          105    DATASET EXPIRES BEFORE MINIMUM DAYS UNTIL EXPIRATION IS REACHED
M0031          356    TAPE DATASET IS OUT OF AREA
M0033          388    TAPE HAS STACKED DATA SETS
M0035          127    DATASET LOGICAL RECORD LENGTH (LRECL) EXCEEDS 32,760 BYTES
M0037           26    TAPE DATASET HAS AN UNDEFINED RECORD FORMAT (RECFM)
M0043       18,298    SINGLE VOLUME TAPE DATASET IS EXPLICITLY EXCLUDED
M0046        1,283    DATASET IS VAULTED
```

Note Explanations of the Tape/Copy rejection message codes can be found in the Tape/Copy "Messages & Codes Guide".

Tape Pre-Pull List Reports

The Tape Pre-Pull List Reports provide a summarized listing of the tape volsers selected for conversion by the candidate selection job run. There are several options that the user can specify to determine the format and content of the Tape Pre-Pull List Reports. Examples follow:

In the standard individual Tape Pre-Pull List Report, the tapes are listed in both ascending numeric order for pulling the tapes from the tape library, and in mount order as they will be requested when the conversion job is run.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                                PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE PRE-RUN PULL LIST FOR OPENTECH_SYSTEMS,_INC.                                PAGE      1

INSTRUCTIONS:  PRE-PULL ALL LISTED TAPES BEFORE RELEASING THE TAPE/COPY CONVERSION JOB CA102000 LOCATED IN
                DATASET:  OT.RELTEST.CA1R52.TEST02.CNTL(JOB00005)

TAPE PULL LIST:                                                                    TAPE MOUNT LIST:

040075   044147   055378   061522   078342                                         055378   041433   063235   078892   067531
040104   044275   055399   061678   078396                                         055399   065056   050303   078936   042308
040142   044478   055423   061876   078892                                         055429   065281   050490   079328   064023
040176   044480   055429   062083   078936                                         055591   066044   079897   049111   064060
040263   044515   055591   062118   079328                                         058795   066091   079930   049588   047039
040524   044524   055851   062338   079897                                         060422   066226   066421   053932   047661
040556   044732   055973   062435   079930                                         040075   057148   053273   057833   047722
040954   044780   056395   062616                                                  040524   062338   065243   058325
041019   045584   056743   062645                                                  040954   040263   043637   058374
041108   046239   056811   062943                                                  067661   041132   043213   058453
041132   046688   057137   063235                                                  068156   041524   059650   041373
041266   047039   057148   063428                                                  068566   061128   054057   041460
041268   047167   057227   063574                                                  068959   061367   054078   041510
041373   047661   057245   063604                                                  059677   061384   044780   041538
041433   047722   057340   063605                                                  040176   061522   046239   058185
041460   048020   057341   063612                                                  041019   061876   046688   058401
041510   049067   057342   063851                                                  057600   049067   044515   058551
041524   049111   057343   064023                                                  057673   053827   044524   058681
041538   049588   057600   064060                                                  057694   058207   043725   065238
041551   049652   057673   065056                                                  057740   060759   043862   065504
041581   050048   057694   065189                                                  057781   062645   051419   065940
041656   050303   057740   065238                                                  058617   063428   051460   066169
```

The Master Pre-Pull List Report is used to display all volsers to be converted by all of the conversion jobs in the conversion job library generated by the candidate selection job (rather than having a separate report for each conversion job).

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                                PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE MASTER PRE-RUN PULL LIST FOR OPENTECH_SYSTEMS,_INC.                         PAGE      1

TAPE PULL SEQUENCE LIST:
 000000   000007   000014   000021   000028   000035   000045   001035   001046   001124
 000001   000008   000015   000022   000029   000036   000046   001036   001048   001125
 000002   000009   000016   000023   000030   000037   001030   001037   001051
 000003   000010   000017   000024   000031   000038   001031   001038   001052
 000004   000011   000018   000025   000032   000039   001032   001039   001053
 000005   000012   000019   000026   000033   000040   001033   001041   001113
 000006   000013   000020   000027   000034   000041   001034   001042   001114
```

By default, only the volser numbers are listed on the pull list reports, however the LIST-LOCATION-INFO-ON-PRE-PULL-REPORT parameter gives users the option of producing extended location format detail lines that not only print the volser, but also print the outcode and slot number on the pull list reports (LIST-LOCATION-INFO-ON-PRE-PULL-REPORT: YES).

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE PRE-RUN PULL LIST FOR OPENTECH_SYSTEMS,_INC.                        PAGE      1

INSTRUCTIONS:  PRE-PULL ALL LISTED TAPES BEFORE RELEASING THE TAPE/COPY CONVERSION JOB CA102000 LOCATED IN
               DATASET:  OT.RELTEST.CA1R52.TEST02.CNTL(JOB00001)

TAPE PULL SEQUENCE LIST:                                          TAPE MOUNT SEQUENCE LIST:                   PAGE  1 OF  1
 OUT1    /01000001/000001                                            OUT1    /01000002/000002
 OUT1    /01000002/000002                                            OUT1    /01000001/000001


REL x.x.x  PTF x                                     T A P E / C O P Y                                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE MASTER PRE-RUN PULL LIST FOR OPENTECH_SYSTEMS,_INC.                 PAGE      1

TAPE PULL SEQUENCE LIST:
 OUT1    /01000001/000001
 OUT1    /01000002/000002
 OUT1    /01000003/000003
 OUT1    /01000004/000004
 OUT1    /01000005/000005
 OUT1    /01000006/000006
 OUT1    /01000007/000007
```

Note If the user is pre-pulling conversion tapes before releasing the conversion jobs and cannot locate a tape, they can add the missing tape volser to the LOSTVOLS member of the Tape/Copy PARMLIB library. The conversion jobs will check this member and, if a tape is found in the list, the tape will be automatically dropped from the conversion process and the next tape will be processed. If the missing tape is part of a multi-volume chain, only the missing tape volser needs to be put in the LOSTVOLS member as Tape/Copy will drop the entire volser chain.

Reblocking Status Report

This report is only produced if the OUTPUT-FILE-REBLOCKING parameter value is set to a Tape/Copy PARMLIB member (such as, >APPLRULE) which contains user-defined reblocking rules, a Reblocking Status Report is produced to show each dataset and the reblocking rule that applies to it.

Note See Chapter 16 for more information on Output File Reblocking.

```
REL x.x.x  PTF x                          T A P E / C O P Y                          PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME: xx:xx:xx   REBLOCKING STATUS REPORT FOR OPENTECH_SYSTEMS        PAGE      1

+  RULE  +
+---ID---+ DATASET NAME                                  VOLSER +--------------STATUS MSG--------------+

           OT11.STACK.OT110000.D2004126.T104733          000044 RBLK OF UNBLKED DATASET: N AND RECFM: F
         2 OT.APPLA.SZ12.DATA0001.SFSV.DATASET           000044 RBLKMEM: RBLKRUL1, RBLK OPTION: 0717273
         0 OT.APPLA.SZ12.DATA0008.SFSV.GDG.G0003V00      000044 RBLKMEM: RBLKRUL1, RBLK OPTION: NONE
         0 OT.APPLA.SZ12.DATA0008.SFSV.GDG.G0001V00      000038 RBLKMEM: RBLKRUL1, RBLK OPTION: NONE
           OT.RELTEST.SZ12.FDR.SFSV.DATASET              000042 NO REBLOCK, RECFM OF DATASET: U
         4 OT.APPLA.SZ12.DATA0003.SFMV.DATASET           000003 RBLKMEM: RBLKRUL1, RBLK OPTION: 0008888
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE01            000027 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE02            000027 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE03            000027 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE04            000028 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE05            000028 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
```

Rules Processor Report

The Rules Processor Report is produced during the Candidate Selection process and written to DD RULESRPT. This report serves as a cross reference between any user-defined “Rules” tables and the Tape/Copy generated Rule ID's.

Note The Rules Processor Report is generated for any/all “rules processing” features, such as Co-Location (Chapter 21) and Reblocking (Chapter 16), as well as the VDR Copy Rule and Disk Rule tables (VDR users only). A section will be printed for each rules processing function that is in effect when the Candidate Selection job runs.

Warning The Rules Processor Report will not list the statement specified by a BY rule logic sub-modifier. It will list the rules that were generated based on the BY statement and the contents of the table it specified.

The example below shows a Rules Processor Report that includes a Co-Location Report and Reblocking Rules Table.

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y                                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CO-LOCATION TABLE REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE      1

 CO-LOCATION        TMS
 +---ID----+      +FIELD+    +-----------------COMPARE DATA-----------------+

           1  IF  EXPDT   EQ 9999.999
           2  IF  EXPDT   EQ 9999.000
           3  IF  EXPDT   EQ 9998.000
           4  IF  EXPDT   EQ 9998.000
           5  IF  EXPDT   EQ 9992.000
           6  IF  EXPDT   EQ 9990.000
           7  IF  EXPDT   EQ 9990.000
           8  IF  EXPDT   EQ 9989.000
           9  IF  EXPDT   EQ 9988.000
          10  IF  EXPDT   EQ 9986.000
          11  IF  EXPDT   EQ 9982.000
          12  IF  EXPDT   EQ 9900.001
          13  IF  EXPDT   LE 2001.049
          14  IF  EXPDT   LE 2001.079
          15  IF  EXPDT   LE 2001.109
          16  IF  EXPDT   LE 2001.199
          17  IF  EXPDT   LE 2002.019
          18  IF  DSN     EQ OT.APPLA./
          19  IF  DSN     EQ OT.APPLA./
              AND DSN     NE >CLDSN1
                                *.DATA0005/
                             OR *.DATA0004/
                             OR *.DATA0001/
          20  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ OT08EOV2
          21  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ OT08EOV1
          22  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ OT08
          23  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ X

REL x.x.x  PTF x                                           T A P E / C O P Y                                     PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     RULES PROCESSOR REPORT FOR TABLE: RBLKRULE FOR OPENTECH_SYSTEMS,_INC.          PAGE      1

 +  RULE   +          COMPARE
 +---ID----+          +FIELD+     +-----------------COMPARE DATA-----------------+
           1  IF      DSN      EQ OT.APPLA./
              THEN    OPTIMUM
           2  IF      DSN      EQ >APPLTBL
                                   OT.RELTEST./
                                   OR OT.CSTEST./
              DEFAULT NONE
```

Tape Conversion Forecast Report

The Tape Conversion Forecast Report provides input statistics and output resource forecasts by conversion job. This information is useful for estimating the output tape requirements used by each conversion job. This also helps to prevent exceeding the number of secondary tape dataset records that are pre-allocated by some tape management systems. This report also lets you see an estimate of potential tape savings by implementing tape stacking or moving tape datasets to higher density media.

```
RELEASE x.x.x   PTF LEVEL x                              T A P E / C O P Y                        PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE CONVERSION FORECAST REPORT FOR OPENTECH_SYSTEMS,_INC.                    PAGE      1

                                          +---------INPUT MEDIA STATISTICS---------+ +----------OUTPUT MEDIA FORECAST---------+
+---CONVERSION--+ +--FILE +-DATA USED +CO-LOC+ +MEDIA-+ +TAPES TAPE VOLUME +USAGE +-2NDRY +MEDIA-+ +TAPES TAPE VOLUME +USAGE +-
2NDRY
JOB NAME   MEMBER   COUNT CAPACITY-GB    ID      TYPE     USED CAPACITY-GB    %     FILES   TYPE   NEEDED CAPACITY-GB    %     FILES
OT020001 JOB00001      14       0.002       16 NONVIRT       9       9.000    0.0       8 036          5       5.000    0.0       8
OT020002 JOB00002      20       0.002       18 NONVIRT       6       6.000    0.0      18 036          2       2.000    0.1      18
OT020003 JOB00003      22       0.002       25 NONVIRT       5       5.000    0.0      17 036          4       4.000    0.1      17
OT020004 JOB00004       1       0.004       16 OTATL001     40      40.000    0.0       0 036          1       1.000    0.4       0
OT020005 JOB00005       1       0.001       17 OTATL001      2       2.000    0.1       0 036          1       1.000    0.1       0
OT020006 JOB00006       5       0.001       17 OTVTL001      2       2.000    0.1       4 036          1       1.000    0.1       4
OT020007 JOB00007       1       0.001       16 000001        2       2.000    0.1       0 036          1       1.000    0.1       0
OT020008 JOB00008       4       0.001       25 255255        6       6.000    0.0       0 036          3       3.000    0.0       0

TOTAL                  68       0.014                       72      72.000    0.0      47             18      18.000    0.1      47

       SECONDARY FILE RECORDS NEEDED:           47
```

Note If CONVERSION-JOB-MAX-INPUT-DEVICES is set to a value other than 1 and multiple input devices with different media types are used in the conversion job, the Tape Conversion Forecast Report will report “MIXED” in the Media Type column for the input tapes.

Tape Conversion Forecast Detail Report

The Tape Conversion Forecast Detail Report provides a breakdown of the conversion jobs listed in the Tape Conversion Forecast Report. It lists which datasets are being processed by each separate conversion job, and the order of which they will be processed.

```
RELEASE x.x.x  PTF LEVEL x                               T A P E / C O P Y                        PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE CONVERSION FORECAST DETAIL REPORT FOR OPENTECH_SYSTEMS,INC.              PAGE      1

CO-LOCATION +---CONVERSION--+                                          FILE   FIRST       FILE                    CALCULATED
+---ID----+ JOB NAME   MEMBER  DATASET NAME-----------------------------+  SEQ #  VOLUME  +--SIZE(MB)-+  RETENTION TYPE    EXPDT
          0 OT020001 JOB00001  OT.APPLA.DATA0002.SFMV.DATASET                  1  001001           .200  2001.174
                               OT.APPLA.DATA0003.SFMV.DATASET                  1  001003          4.000  2001.199
                               OT.APPLA.DATA0004.MFSV.FILE01                   1  001043           .100  2001.198
                               OT.APPLA.DATA0004.MFSV.FILE02                   2  001043           .100  2001.198
                               OT.APPLA.DATA0004.MFSV.FILE03                   3  001043           .100  2001.198
                               OT.APPLA.DATA0004.MFSV.FILE04                   4  001043           .100  2001.198
                               OT.APPLA.DATA0004.MFSV.FILE05                   5  001043           .100  2001.198
                               OT.APPLA.DATA0004.MFSV.FILE06                   6  001043           .100  2001.198
                               OT.APPLA.DATA0004.MFSV.FILE07                   7  001043           .100  2001.198
                               OT.APPLA.DATA0006.MFMV.FILE01                   1  001046           .200  2006.148
                               OT.APPLA.DATA0006.MFMV.FILE02                   2  001047           .200  2006.148
                               OT.APPLA.DATA0006.MFMV.FILE03                   3  001048           .100  2006.148
                               OT.APPLA.DATA0006.MFMV.FILE04                   4  001048           .300  2006.148
                               OT.APPLA.DATA0006.MFMV.FILE05                   5  001050           .100  2006.148
                               OT.APPLA.DATA0006.MFMV.FILE06                   6  001050           .100  2006.148
          0 OT020002 JOB00002  OT.APPLA.DATA0005.MFMV.FILE01                   1  001083           .100  2001.298
                               OT.APPLA.DATA0005.MFMV.FILE02                   2  001084           .100  2001.298
                               OT.APPLA.DATA0005.MFMV.FILE03                   3  001085           .200  2001.298
                               OT.APPLA.DATA0005.MFMV.FILE04                   4  001087           .100  2001.298
                               OT.APPLA.DATA0005.MFMV.FILE05                   5  001088           .100  2001.298
```

Optional Candidate Selection Changes

1. Writing PGMSET, INFILE AND NOTIFIES DD * data to members of a PDS

The current release of TapeCopy supports the ability of the "Candidate Selection" jobs to write the data normally written to DD * datasets (sysin dataset) as members of one or more PDS datasets. This functionality should help to facilitate loading the generated "Conversion Jobs" to various Job Scheduling packages as it will no longer be necessary to strip out the DD * data for PGMSETS, INFILE or NOTIFIES DD statements.

This new function is activated by editing the generated "Candidate Selection" job and manually adding a new parameter statement to the PGMSETS DD * input file. The parameter statement to be added is: CONVERSION-ALTERNATE-SYSIN-DATASET-PREFIX. The value specified for this parameter will be used as a prefix to generate names of the PDS's which will be used to hold the data in the pgmsets, infile and notifies DD * datasets. A unique member name will be generated for each "Conversion Job" generated and the resultant jcl will be updated to contain the pds dataset and member names associated with each job.

The pds names are generated by appending the CONVERSION-ALTERNATE-SYSIN-DATASET-PREFIX and either .PGMSET, .INFILE or .NOTIFY. At the start of each “Candidate Selection” job, the pds names for the alternate infile, pgmsets and notifies dd names will be deleted so caution must be exercised to ensure that all "Conversion" jobs generated by each "Candidate Selection" job are complete before running the next "Candidate Selection" job unless the prefix value specified by the parameter CONVERSION-ALTERNATE-SYSIN-DATASET-PREFIX is different for each "Candidate Selection" job.

If the value of the parameter:CONVERSION-ALTERNATE-SYSIN-DATASET-PREFIX is specified as NONE or if the parameter is omitted from the "Candidate Selection" job PGMSETS DD * file, then the datasets related to pgmsets, infile and notifies for the generated "Conversion Jobs" will be written to DD * datasets instead of PDS's.

Integration of Stack Group Processing into Candidate Selection Forecast

For the current release of TapeCopy, several new functions have been added. Among these new functions, the ability to add additional files to an existing VDR Backup volume set was added. This section deals with how the Stack Group processing has been integrated into the TapeCopy Candidate Selection Forecast process.

Several parameters control the use of Stack Group Processing during the Candidate Selection forecast process. These are:

- OUTPUT-FILE-FORMAT: Must be set to STACK
- STACKING-GROUP-NAME: Must be set to something other than NONE
- STACKED-OUTPUT-CUTOFF-UTILIZATION: Specifies the maximum output volume utilization. If this value is exceeded, then STACKING TO EXISTING VOLUMES for the current co-location ID will be suspended, and a new volume set will be created for the co-location ID.

- STACKED-OUTPUT-VOLUME-LIMIT: Specifies the maximum number of output volumes that can be created for the current co-location ID before STACKING TO EXISTING VOLUMES for the current co-location ID is suspended, and a new volume set will be created for the co-location ID.

During the Candidate Selection process, datasets are grouped by the co-location ID derived by matching the criteria in the Co-Location Rules table. This co-location ID is used to search entries STACK GROUP DATASET (the name of this dataset constructed by concatenating the <dynamic allocation prefix>.STACKGRP.<the value of the STACKING-GROUP-NAME parameter>). If the dataset does not exist, then the FORECAST processing functions in its normal mode; otherwise the Candidate Selection process reads the contents of the STACK GROUP DATASET, looking for an entry that matches the co-location ID of the files being processed and has a status of available. If no match is found, the processing continues on normally; otherwise, the volume count and megabytes currently in use for the volume set are accumulated and the forecast process is initialized with the accumulated values.

The Candidate Selection process then selects datasets based upon the parameters provided even when the user is using Stacking Groups, and a pre-existing volume has been selected for a specific job. For example, if the user has specified FILES-PER-CONVERSION-JOB: 100, a job that is adding files to a tape which already has 90 files will still select up to 100 more files to add to that tape. The only exceptions to this are the following parameters:

- STACKED-OUTPUT-CUTOFF-UTILIZATION
- STACKED-OUTPUT-MINIMUM-UTILIZATION
- STACKED-OUTPUT-VOLUME-LIMIT

For these parameters, the Forecast process takes into account the previous utilization of the tape and adds new files based on both the preexisting files and the new files. Therefore, if the Forecast processing is building a job and the user has specified a stacked output volume cutoff utilization of 90% and a volume-limit of 1, and that the job selected a previously used volume (from the stack group dataset) and the volume is already 80% full, only enough files are added to the volume set to bring it up to 90% (e.g. add 10% more) instead of adding 90% more. So in those terms, if the total capacity of the previously used tape is 100 GB, and it already contains 80 GB of data, the Conversion job generated should only contain up to 10 GB of additional data, so that the end result would be a tape that is 90% used. If the tape already has 90 GB of data (and therefore it already meets the cutoff-utilization/volume-limit setting), then the Forecast process would not create a conversion job to add any more files to this existing volume set, it would create a new stack group volume set for the co-location ID and leave the previously selected stack group volume set for the co-location ID selected, marked as being “available” in the case the user runs another job specifying a stacked output volume cutoff utilization of 95 percent.

10 Adjust Calculated Dataset Sizes

Topics Covered In This Chapter

Defining Uncompression Rules (page 10-2)

Decompression Rules Table Report (page 10-7)

Introduction

During the Candidate Selection process, in order to forecast the approximate number of output tapes required by a conversion function, Tape/Copy calculates the expected size of each dataset factoring in compression ratio. However, for dataset containing uncompressible data, this forecasted size may not be accurate.

Tape/Copy provides the user with a method for identifying such datasets and assigning them an “uncompression ratio”. This factor is multiplied by the calculated file size in order to modify what Tape/Copy expects the file size to be, and expand the logical size of a dataset containing uncompressible data to the compressed size actually used when the dataset is written to the output tape. This can greatly improve the accuracy of the forecast estimates and allow Tape/Copy conversion jobs to better fill output tapes to capacity when stacking.

Defining Uncompression Rules

The un-compression rules specified in PARMLIB MEMBER: UNCMPRUL permit the user to specify either a multiplying factor or a dividing factor, that will be used in file size calculations to permit the user to influence the utilization of output volumes to help in situations where a certain sets of files contain date that is either highly compressible or highly uncompressible.

The overall effect of the un-compression rules is to permit the forecasting and other functions that rely on file size to work in a more effective manner. Generally, the un-compression rules are not needed, but if an issue with excessive or poor compression of volumes with a set of files is encountered the UNCMPRUL member can be used to correct the problem.

Each line in a UNCMPRUL table may only specify one statement.

Each Uncompression Rule consists of:

- The rule logic modifier (IF, AND, OR) and command verbs (THEN, DEFAULT)
- The tape management system field compare code to be compared against.
- The comparison operator (EQ, NE, GT, etc.).
- The comparison data or table. Comparison data can be specific character strings or character pattern strings for matching fields like dataset name (DSN) and creating job name (CJOB). It can also be a numeric date, a relative date or a keyword date for matching datefield such as expiration date (EXPDT) and create date (CDATE).
- The uncompression multiplier/divisor (used with THEN and DEFAULT command verbs). The uncompression multiplier/divisor is the value multiplied or divided by the file size to modify the calculated file size when a true condition is set for the IF, AND, OR statement set. The valid values are a numeric value from 1 to 9999999. To cause a multiplication to take place prefix the numeric value with a blank or the character “*”, to cause a division to take place prefix thee numeric value with the character “/”.

It is also permissible to code the then/default value with a single decimal point (i.e. 25.3 or *11.2 or /45.8).

Note A DEFAULT statement must be coded as the last statement in any UNCMPRUL member.

Example

```
File Edit Confirm Menu Utilities Compilers Test Help
--------------------------------------------------------------------------------
EDIT OT.TAPECOPY.PARMLIB(UNCMPRUL) - 24.01 Columns 00001 00072
Command ===> Scroll ===> CSR
****** **************************** Top of Data ******************************
000001 * COMPARE COMPARE
000002 *RULE FIELD OP DATA
000003 *----+ +-----+ -- +-----------------------------------------+
000004 IF     DSN     EQ OT.APPLA./
000005 AND    CJOB    EQ >CLCJOB
000006 THEN 555                     * multiply file size by 555
000007 *
000008 IF     DSN     NE OT.APPLA./
000009 AND    CJOB EQ PAY/
000010 THEN *1348                    * multiply file size by 1348
000011 *
000012 IF     DSN     EQ OT.APPLB./
000013 AND    CJOB EQ GLM/
000014 THEN /1235                   * divide file size by 1235
000013 *
000014 IF     DSN     EQ OT.APPLB./
000015 AND    CJOB EQ GLY/
000016 THEN /12.2                   * divide file size by 12.2
000017 *
000018 DEFAULT 1                    * default multiply file size by 1
****** ******************************** Bottom of Data***************************
```

Rule Logic Modifiers

The rule logic modifier is used to specify how the Uncompression Rule statement is processed relative to the previous statement in the table.

IF, NEW, AND, OR Modifiers

If the rule logic modifier is IF, NEW, or not specified (blank), then the current statement becomes the first statement of a new Uncompression Rule entry.

If the rule logic modifier is AND, this indicates that the previous statement and the current statement are part of the same rule and both statements must be "true" for a candidate to be assigned to this Uncompression Rule entry.

If the rule logic modifier is OR, this indicates that the previous statement and the current statement are part of the same rule and either statement must be "true" for a candidate to be assigned to this Uncompression Rule entry.

THEN, DEFAULT Verbs

If the Uncompression Rule created using the entries in this table is found to be “true”, the THEN command verb can be used to specify the name of the desired uncompression value to use for datasets that match the “true” Uncompression Rule entry.

If a THEN command verb is not specified in association with the “true” Uncompression Rule, the uncompression multiplier value found in the DEFAULT command verb statement will be used. The default value is typically set to 1.

Tape Management System Field Compare Code

The tape management system field compare code is used to identify which tape management system field Tape/Copy should compare with the user-defined comparison data.

Field Compare Code	Description
ACCTNUM	Account number
ATLID	Automated tape library name
BKCRYPT	VDR Backup Encryption Flag (Y/N) (VDR CopyCrypt users only; used only during VDR Recovery)
CDATE	Creation date
CDDNAME	Creating DD name
CEXPDT	Calculated expiration date
CJOB	Creating job name
CPGM	Creating program name
CSTEP	Creating job step name
DSN	Dataset name
EXPDT	Expiration date
KBSIZE	Size of the file in kilo-bytes
LDATE	Last used date
LDDNAME	Last used DD name
LJOB	Last used job name
LPGM	Last used program name
LSTEP	Last used job step name
OUTCODE	Outcode / Vault ID / Location ID
VOLSER	First volser of file

Comparison Operators

The following table provides a list of the comparison operands supported for Uncompression Rule processing.

Comparison Operator	Description
EQ	Equal
NE	Not equal
GT	Greater than
LT	Less than
GE	Greater than or equal
LE	Less than or equal

Comparison Data

The valid formats for comparison data are character data, date values and Tape/Copy PARMLIB library members that contain character data or date values.

Character data can either be specific values or generic/pattern values (using valid OpenTech Systems wildcard standards - see Appendix A). Character data is the expected data type when comparing the following tape management system fields:

ACCTNUM	CSTEP	LSTEP
ATLID	DSN	OUTCODE
CDDNAME	LDDNAME	VOLSER
CJOB	LJOB	
CPGM	LPGM	

Date values can be either:

- **Specific dates** - provided in Julian (yyyy.ddd) or Gregorian (mm/dd/yyyy) format.
- **Relative dates** - specified by a single numeric value and are calculated as a number of days from the current date.
- **Keyword dates** - used to specify the expiration value used for candidates that use special expiration criteria. The valid keyword date values are:

PERMANENT	UNKNOWN
CYCLECNTL	DATECNTL
FOREIGN	MOVEIMMED
LDATE	USERDATE
ELAPSEDDAYS	STATSDATE
CATLGDATE	CATALOG

Note Internally, Tape/Copy stores all keyword dates as a Julian date (9900.001 or higher). Therefore, if the EXPDT field value is less than 9900.001 it is considered a specific date expiration value.

Using a Table as Comparison Data

Uncompression Rule processing will also accept the name of a Tape/Copy PARMLIB member as the comparison data. The PARMLIB member should contain a table of character data or date values (as defined on the previous page). The PARMLIB member name should be prefixed by a '>' symbol to distinguish it from standard comparison data.

For example:

```
>UNCPDATA
```

UNCPDATA would need to be a member in the Tape/Copy PARMLIB library (or the name of a ddname within the candidate selection job stream).

If used as the comparison data for an IF, AND or OR statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and any datasets that match any of the entries will be selected for that Uncompression Rule group. The entries in a member used for comparison data for IF, AND or OR should be in the form of a list. One entry per line, such as:

```
****** ***************************** Top of Data ******************************
000001 FILEA.PROD.LIST
000002 FILEB.PROD.LIST
000003 FILE*.WORK.LIST
****** **************************** Bottom of Data ****************************
```

Note Each entry in the PARMLIB member table will be part of the same Uncompression Rule (all will use the same uncompression multiplier value).

Decompression Rules Table Report

The Decompression Rules Table Report (a Rules Processor Report) is produced during the Candidate Selection process and written to DD RULESRPT. This report serves as a cross reference between the user-defined Uncompression Rules table and the Tape/Copy generated Rule ID's.

Note Rules Processor Reports are also generated for other “rules processing” features, such as Co-Location. A section will be printed for each rules processing function that is in effect when the Candidate Selection job runs.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DECOMPRESSION RULES TABLE REPORT FOR OPENTECH_SYSTEMS,_INC.          PAGE      1

 +  RULE   +          COMPARE
 +---ID----+          +FIELD+     +-----------------COMPARE DATA-----------------+

           1 IF       DSN      EQ OT.APPLA.SZ12.DATA0001./
             THEN                144
           2 IF       DSN      EQ OT.APPLA.SZ12.DATA0002./
             THEN                100
           3 IF       DSN      EQ OT.APPLA.SZ12.DATA0003./
             THEN                1000
           4 IF       DSN      EQ OT.APPLA.SZ12.DATA0004./
             THEN                900
           5 IF       DSN      EQ DOUG./
             OR       ATLID    NE ATLXXXXX
             OR       ATLID    NE ATLXXXX1
             THEN                50000
           6 IF       DSN      EQ *TA0002*
             OR       DSN      EQ *TA0003*
             THEN                2000
           7 IF       ACCTNUM  EQ *=00100*
           8 IF       ACCTNUM  EQ *=00101*
           9 IF       ACCTNUM  EQ *=00102*
          10 IF       ACCTNUM  EQ *=00000*
          11 IF       ACCTNUM  EQ *ACCT1*
          11 IF       ACCTNUM  EQ *ACCT1*
          12 IF       DSN      EQ OT./
             DEFAULT             1
```

11 Calculated Expiration Dates

Topics Covered In This Chapter

Calculating Expiration Dates with Tape/Copy (page 11-2)
Calculated Expiration Date File (page 11-3)
Special Considerations (page 11-4)
Calculated Expiration Date Report (page 11-6)
Bypassing the Calculated Expiration Date (page 11-9)

Introduction

Tape/Copy can calculate the expected expiration dates of the following expiration types:

- Generation data group (GDG) datasets
- Cycle controlled datasets
- Catalog controlled GDGs
- Last Used Date controlled datasets
- Expiration Date controlled datasets

Calculating the expiration date of datasets with these retention types is especially useful for stacking datasets that expire around the same time together so that the stacked volumes will expire on a more consistent basis.

The expected expiration dates can be calculated:

- During the Calculated Expiration Date Determination phase of Tape/Copy's Candidate Selection process.

  or

- Using the stand alone JCL located in the BLDCEXPF member of the Tape/Copy JCLLIB to create the Calculated Expiration Date file (which can then be used as input to the selection process).

Calculating Expiration Dates with Tape/Copy

The calculation of expiration dates during the Candidate Selection process is controlled by the absence or inclusion of the BYPSEXPD DD card and the settings of the following parameters:

GDG-EXPDT-DETERMINATION

- Set to **YES** to perform the calculation of expiration dates for Catalog controlled GDG datasets.
- Set to **NO** to bypass these calculations.

CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES

- Set to **YES** to perform the calculation of expiration dates for CYCLE, LDATE and expiration date controlled datasets.
- Set to **NO** to bypass these calculations.

Note The parameters above can be set independent of each other (the user can set one of them to NO and the other to YES, if desired).

Calculating CYCLE Controlled Expiration Dates

If the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter is set to **YES**, the calculation of expiration dates for CYCLE controlled datasets is further modified by the following parameters:

CALCULATE-CYCLE-CONTROL-CDAY-OPTION

- Set to **TAPE** if each individual creation of a dataset under CYCLE control is considered to be a single cycle.
- Set to **DAY** if all creations of a dataset on any given day are to be considered a single cycle.

CALCULATE-CYCLE-CONTROL-CJOB-OPTION

- Set to **JOB** if multiple job names creating the same dataset name are considered to be separate cycles.
- Set to **DSN** if the creating job name is not used in establishing cycles.

Calculated Expiration Date File

The Calculated Expiration Date file is used by Tape/Copy to track the calculated expiration dates of selected datasets. It contains the job names, dataset name patterns and calculated “LifeSpans” for CYCLE and/or CATLG (GDG) controlled datasets.

The Calculated Expiration Date file is created by the Tape/Copy Candidate Selection process when the user opts to use calculated expiration date processing. It can also be created using the stand alone JCL in the BLDCEXPF member of the Tape/Copy JCLLIB.

The Calculated Expiration Date file is created for CATLG (GDG) controlled datasets only if the GDG-EXPDT-DETERMINATION parameter is set to **YES**, and for CYCLE controlled datasets only if the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter is set to **YES**. In either case, the BYPSEXPD DD name must not be present if the user wants Tape/Copy to calculate expiration dates.

CATLG (GDG) LifeSpan Calculation

The LifeSpan of CATLG (GDG) controlled datasets is calculated as follows:

```
((G1 / G3) * G2 ) + 2  = LIFESPAN OF GDG IN DAYS BEFORE
EXPIRATION
```

- **G1** is the number of days between creation of newest GDG in the group (determined by the base GDG name in generation dataset group) and the oldest.
- **G2** is the GDG limit of GDG’s from the system catalog.
- **G3** is the number of generations between the first and last from which the creation frequency is derived.

CYCLE LifeSpan Calculation

The LifeSpan of CYCLE controlled datasets is calculated as follows:

```
(G1 * G2)  = LIFESPAN OF A CYCLE BEFORE EXPIRATION
```

- **G1** is the average cycle dataset creation frequency.
- **G2** is the maximum cycle value for the cycle dataset group.

Maintaining the Calculated Expiration Date File

The Calculated Expiration Date file is self maintaining in that it gets recreated by the Candidate Selection process. The user can also recreate the Calculated Expiration Date file by running the JCL in the BLDCEXPF member of the Tape/Copy JCLLIB.

Warning Tape/Copy's expiration date calculations may not be accurate if the Calculated Expiration Date file is not kept current of all updates and changes.

Special Considerations

1. Tape/Copy will skip the calculation of the CYCLE and CATLG (GDG) controlled datasets, but will continue to calculate the expiration of LDATE controlled datasets if any of the following conditions occur:
   - If Tape/Copy cannot allocate the Calculated Expiration Date file (@DSPREFIX.TAPECOPY.TMC.CEXPDT).
   - If the CALCULATE-CYCLE-CONTROL-CDAY-OPTION and/or the CALCULATE-CYCLE-CONTROL-CJOB-OPTION values in the Calculated Expiration Date file header section differ from the parameter values specified in the Candidate Selection job.
   - If Tape/Copy detects an invalid record in the Calculated Expiration Date file. When an invalid entry is detected, an attempt is made to diagnose the problem and a Calculated Expiration Date Errors report is generated to inform the user of the problem.

Example

```
RELEASE x.x.x   PTF LEVEL x                              T A P E / C O P Y          PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CALCULATED EXPIRATION DATE ERRORS FOR OPENTECH_SYSTEMS,_INC.PAGE  1

  STMT #                                STATEMENT IN ERROR                                  INFORMATIONAL MESSAGE
                 1         2         3         4         5         6         7         8
 +------+ 1...5....0....5....0....5....0....5....0....5....0....5....0....5....0....5....0 <----------------------->


       9 00         644OT.TCTEST.CALCEXDT.LIMIT05.FREQ0007.G????V?? 00037CATLG08418      STATMENT HAS BEEN ALTERED
       9 00         644OT.TCTEST.CALCEXDT.LIMIT05.FREQ0007.G????V?? 00037CATLG08418      ERROR IN STATEMENT
       9            *
      10 00         0030OT.TZTEST.TEST.CYCLCNTL.RECORD               00003CYCLE07372      STATMENT HAS BEEN ALTERED
```

2. Tape/Copy can also detect if any modifications have been made to the Calculated Expiration Date File and will issue a warning message to alert the user. Tape/Copy will continue to calculated the expiration dates for CYCLE, CATLG (GDG) and LDATE controlled datasets, provided that the entries pass internal validity checks.

3. Technical Support recommends that if using the Calculated Expiration Date feature, the Calculated Expiration Date file should be rebuilt each time the Candidate Selection process is performed by NOT bypassing the Calculated Expiration Date Determination phase.

   However, if running the Calculated Expiration Date Determination phase of Candidate Selection is hindering the performance and run-time of the selection jobs too much and the user wishes to bypass this phase (using the BYPSEXPD DD), a process should be implemented to rebuild the Calculated Expiration Date file on a periodic basis (daily or weekly depending on how often new dataset groups are added or how often dataset usage patterns change) using the stand alone job in the BLDCEXPF member of the Tape/Copy JCLLIB.

4. **Using the CDTENH option for the PRE-EDIT-REJECTIONS parameter (Pre-Filter Scratches: CDTENH on the ISPF panels) in the Tape/Copy Candidate Selection process will cause Tape/Copy to drop historical data that is used to calculate the expected expiration dates. This may affect the accuracy of the calculated dates**. If the CDTENH option is used during selection, a process should be implemented to rebuild the Calculated Expiration Date file on a periodic basis (daily or weekly depending on how often new dataset groups are added or how often dataset usage patterns change) using the stand alone job in the BLDCEXPF member of the Tape/Copy JCLLIB.

5. Under certain circumstances, it may be desirable or necessary to create the Calculated Expiration date file once and then reuse the preexisting version of the file in future Candidate Selection jobs.

   This is a supported option, albeit not one that is recommended by OpenTech Systems and is accomplished by including a DD statement in the Candidate Selection Jobs with the DDNAME equal to TMCEXPDT, and the DSN equal to that of a pre-existing Calculated Expiration Date dataset.

   This will cause the Candidate Selection job to skip the refresh and re-creation of the Calculated Expiration Date dataset and use the values contained in the dataset specified by the //TMCEXPDT DD statement instead.

   Also, the values specified for the following parameters are copied from the pre-existing calculated expiration dataset specified by the //TMCEXPDT DD statement:

   GDG-EXPDT-DETERMINATION

   CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES

   CALCULATE-CYCLE-CONTROL-CDAY-OPTION

   CALCULATE-CYCLE-CONTROL-CJOB-OPTION

   It should be noted that once a Candidate Selection job or the BLDCEXPF member contained in JCLLIB is run without a //TMCEXPDT DD statement, any dataset that has a dataset name in the format of <dynamic allocation prefix>.TMC.CEXPDT, will be scratched and recreated.

Calculated Expiration Date Report

The Calculated Expiration Date Report identifies the calculated expiration dates and any issues which precluded the calculation of expiration dates for a given dataset. The report can be generated stand alone using the JCL in the BLDCEXPF member of the JCLLIB library. It is also created by the Tape/Copy Candidate Selection process whenever the Expiration Date Determination phase is performed.

Example

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y                        PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CALCULATED EXPIRATION DATE REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE      1

CYCLE OPTIONS: CDAY_OPTION: DAY  CJOB_OPTION: DSN


RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y                        PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CALCULATED EXPIRATION DATE REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE      2

CYCLE OPTIONS: CDAY_OPTION: DAY  CJOB_OPTION: DSN

JOB NAME                DATASET NAME                FIRST  FILE     CREATE  LAST USED RETENTION   COMPUTED  INFORMATIONAL MESSAGES
+------+ +----------------------------------------+ VOLSER +SEQ +  +-DATE-+  +-DATE-+ +-TYPE--+  +EXPDATE+  +------------------
-+

TESTJOB2 OT.TCTEST.TEST.CYCLCNTL.RECORD              005310      1  2002.017  1999.121 CYCLE/ 03   2002.020 A   1 B   3 C   3
TESTJOB2 OT.TCTEST.TEST.CYCLCNTL.RECORD              005311      1  2002.017  1999.121 CYCLE/ 03   2002.020 A   1 B   3 C   3
TESTJOB1 OT.TCTEST.TEST.CYCLCNTL.RECORD              005312      1  2002.018  1999.121 CYCLE/ 03   2002.021 A   1 B   3 C   3
TESTJOB1 OT.TCTEST.TEST.CYCLCNTL.RECORD              005313      1  2002.018  1999.121 CYCLE/ 03   2002.021 A   1 B   3 C   3
TESTJOB2 OT.TCTEST.TEST.CYCLCNTL.RECORD              005314      1  2002.018  1999.121 CYCLE/ 03   2002.021 A   1 B   3 C   3
TESTJOB2 OT.TCTEST.TEST.CYCLCNTL.RECORD              005315      1  2002.018  1999.121 CYCLE/ 03   2002.021 A   1 B   3 C   3
_____________________________________________________________


RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y                         PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CALCULATED EXPIRATION DATE REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE      3

CYCLE OPTIONS: CDAY_OPTION: DAY  CJOB_OPTION: DSN


JOB NAME                DATASET NAME                FIRST  FILE     CREATE  LAST USED RETENTION   COMPUTED  INFORMATIONAL MESSAGES
+------+ +----------------------------------------+ VOLSER +SEQ +  +-DATE-+  +-DATE-+ +-TYPE--+  +EXPDATE+  +------------------
-+

TOTAL CATLG CTRL DATASETS ================>             21
TOTAL CYCLE CTRL DATASETS ================>             17
TOTAL LDATE CTRL DATASETS ================>              2
TOTAL OTHER CTRL DATASETS ================>            252
TOTAL RECORDS READ =======================>            292
TOTAL RECORDS WRITTEN ====================>            292
```

The following is an example of the Calculated Expiration Date Report when a pre-existing calculated expiration date dataset is specified by including a //TMCEXPDT DD statement, which specifies the dataset name of a pre-existing calculated expiration dataset name.

The title line, which normally displayed the CYCLE OPTIONS:, has been altered to include the date and time when the calculated expiration date file was created. These values are not displayed when a pre-existing calculated expiration date dataset has not been specified by the inclusion of a //TMCEXPDT DD DISP=SHR,DSN= < name of pre-existing calculated expiration date dataset> .

Example

```
REL X.X.X  PTF X                                        T A P E / C O P Y                                        OTTCCAND JOB03123


DATE:  MM/DD/YYYY   TIME:  HH:MM:SS     CALCULATED EXPIRATION DATE REPORT FOR NONE                                      PAGE      1

CYCLE OPTIONS: CDAY_OPTION: TAPE CJOB_OPTION: DSN    PRE-EXISTING CALCULATED EXPDT FILE CREATED ON: MM/DD/YYYY AT: HH:MM:SS

JOB NAME                DATASET NAME                FIRST  FILE     CREATE  LAST USED RETENTION  COMPUTED  INFORMATIONAL MESSAGES
+------+ +-----------------------------------------+ VOLSER +SEQ + +-DATE--+ +-DATE--+ +--TYPE--+ +EXPDATE+ +-------------------+

OINPTBA1 OT11.TESTGDG.G0013V00                       V00248      1  20XX.061  20XX.061 CYCLE/ 03   20XX.064 A   1 B   3 C   3
OINPTBA1 OT11.TESTGDG.G0014V00                       V00256      1  20XX.062  20XX.062 CYCLE/ 03   20XX.065 A   1 B   3 C   3
OINPTBA1 OT11.TESTGDG.G0015V00                       V00264      1  20XX.063  20XX.063 CYCLE/ 03   20XX.066 A   1 B   3 C   3
OINPTBA2 OT11.TESTGDG.G0016V00                       V00265      1  20XX.064  20XX.064 CYCLE/ 03   20XX.067 A   1 B   3 C   3
OINPTBA2 OT11.TESTGDG.G0017V00                       V00266      1  20XX.065  20XX.065 CYCLE/ 03   20XX.068 A   1 B   3 C   3
OINPTBA2 OT11.TESTGDG.G0018V00                       V00280      1  20XX.066  20XX.066 CYCLE/ 03   20XX.069 A   1 B   3 C   3
OINPTBA3 OT11.TESTGDG.G0019V00                       V00285      1  20XX.067  20XX.067 CYCLE/ 03   20XX.070 A   1 B   3 C   3
OINPTBA3 OT11.TESTGDG.G0020V00                       V00288      1  20XX.068  20XX.068 CYCLE/ 03   20XX.071 A   1 B   3 C   3
OINPTBA3 OT11.TESTGDG.G0021V00                       V00291      1  20XX.069  20XX.069 CYCLE/ 03   20XX.072 A   1 B   3 C   3
OINPTBA3 OT11.TESTGDG.G0022V00                       V00304      1  20XX.059  20XX.059 CYCLE/ 03   20XX.062 A   1 B   3 C   3
OINPTBA3 OT11.TESTGDG.G0023V00                       V00306      1  20XX.060  20XX.060 CYCLE/ 03   20XX.063 A   1 B   3 C   3
OINPTBA3 OT11.TESTGDG.G0024V00                       V00309      1  20XX.058  20XX.058 CYCLE/ 03   20XX.061 A   1 B   3 C   3
-------------------------------------------------------------------------------------------------------------------------------


REL X.X.X  PTF X                                        T A P E / C O P Y                                        OTTCCAND JOB03123


DATE:  MM/DD/YYYY   TIME:  HH:MM:SS     CALCULATED EXPIRATION DATE REPORT FOR NONE                                      PAGE      2

CYCLE OPTIONS: CDAY_OPTION: TAPE CJOB_OPTION: DSN    PRE-EXISTING CALCULATED EXPDT FILE CREATED ON: MM/DD/YYYY AT: HH:MM:SS

JOB NAME                DATASET NAME                FIRST  FILE     CREATE  LAST USED RETENTION  COMPUTED  INFORMATIONAL MESSAGES
+------+ +-----------------------------------------+ VOLSER +SEQ + +-DATE--+ +-DATE--+ +--TYPE--+ +EXPDATE+ +-------------------+

TOTAL CATLG CTRL DATASETS ================>              0
TOTAL CYCLE CTRL DATASETS ================>             12
TOTAL LDATE CTRL DATASETS ================>              0
TOTAL OTHER CTRL DATASETS ================>          3,638
TOTAL RECORDS READ =======================>          3,650
TOTAL RECORDS WRITTEN ====================>          3,650
```

Informational Messages

Under the INFORMATION MESSAGES report column, there are informational messages posted related to the actions and issues surrounding the calculation of expiration dates for a given dataset. The informational messages are as follows:

- **INSUFF CYCLES TO CALC** - This message is issued when there are an insufficient number of cycle controlled datasets for the identified dataset name to calculate the expiration date.
- **INSUFF GNRTNS TO CALC** - This message is issued when there are an insufficient number of GDG generations to develop the creation frequency.
- **LUSDT ZERO, BASIS CRTDT** - This message is issued when the Last Used Date for the dataset is zero, in this case the calculated expiration date is derived by adding the LDATE value to the dataset's Creation Date.
- **Axxxx Bxxxx Cxxx Dxxxx** - This message is issued when the expiration date has been calculated for a CATLG (GDG) dataset.

  The fields A, B, C, and D have the following meanings:

  - **A** - This is elapsed days between the creation of the newest generation and the oldest generation of the dataset.
  - **B** - This is GDG Limit from the system catalog.
  - **C** - This is number of generations between the newest GDG and the oldest GDG.
  - **D** - This is the calculated lifespan for the CATLG (GDG) dataset. This value will be rounded up by two (2) and added to the dataset's creation date to derive the expiration date for the dataset.
- **Axxxx Bxxxx Cxxxx** - This message is issued when the expiration date has been calculated for a 'CYCLE' controlled dataset.

  The fields A, B and C have the following meanings:

  - **A** - This is the average creation frequency for this dataset group.
  - **B** - This is the highest cycle value found for this dataset group.
  - **C** - This is the calculated lifespan for the dataset group. This value will be added to the dataset's creation date to derive the calculated expiration date.

Bypassing the Calculated Expiration Date

Determination Phase

Tape/Copy, by default, does not perform expiration date calculations so the Calculated Expiration Date Determination phase is not performed unless the user chooses to run it. However, if this feature has been in use in the past and the user wishes to discontinue use of the feature (or just modify which expiration types are calculated) the user can:

- Specify **NO** as the value for the GDG-EXPDT-DETERMINATION parameter will cause Tape/Copy to bypass the calculation of the expiration dates of CATLG (GDG) controlled datasets.
- Specifying **NO** as the value for the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter will cause Tape/Copy to bypass the calculation of the expiration dates of CYCLE and LDATE controlled datasets.
- Use the **BYPSEXPD DD** card (i.e. - //BYPSEXPD DD DUMMY) and/or set both the GDG-EXPDT-DETERMINATION parameter and the CALCULATE-CYCLE-CONTROLLED-EXPIRATION-DATES parameter to **NO** to cause Tape/Copy to bypass all expiration date calculations.

12 Tape/Copy Conversion Process

Topics Covered In This Chapter

Introduction (page 12-2)

Ejecting Tapes (page 12-2)

Tapes Currently Already In Use (page 12-2)

Using More Than One Input Device (page 12-2)

Erasing Previously Written Data the Output Tape (page 12-3)

Reports Created by the Conversion Process (page 12-3)

Generic EDM Update (page 12-9)

How Tape/Copy Handles Failed Conversions (page 12-10)

Tape/Copy/Advanced Recall Interface (page 12-13)

Setting VTS Advanced/Outboard Policy Management Values (page 12-15)

Bulk Volume Information Retrieval (BVIR) Support (page 12-15)

Introduction

The term “conversion” when relating to Tape/Copy, means the copying or moving of tape data from one tape (real or virtual) to another.

- When performing a MOVE, Tape/Copy will copy all of the data from the input tape to a new output tape and volser. Then the input tape will be expired based on the setting of the MOVED-DATASET-RETENTION-PERIOD parameter, and subsequently flagged for scratch.
- When performing a COPY, Tape/Copy will copy all of the data from the input tape to a new output tape and volser. The input tape will remain unchanged.

The PROPRIET member of the Tape/Copy PARMLIB, which is configured during installation, is used to determine which copy engine should be used to perform the conversion or if databases (other than the TMS and ICF catalog) need to be updated. By default, Tape/Copy uses its own internal EXCP copy engine.

Ejecting Tapes

Tape/Copy provides a parameter called EJECT-TAPES that allows the user to control whether the conversion process will eject ATL resident tapes after it has processed them, and also controls which tapes will be ejected (the input tapes, the output tapes, both or neither). In addition, users that have STK devices can use the EJECT-TAPES-FROM parameter to specify a location (such as a specific CAP door) where the tapes should be directed when being ejected. The Tape/Copy EJECT-TAPES option will cause the tapes to be ejected at the end of the conversion job.

Tapes Currently Already In Use

If the Tape/Copy conversion job finds that one of its requested input tapes is already in use by another job, it will skip that volume and continue on with the next volume (or volume set) in the conversion job after issuing a rejection message indicating the volume was not copied because it was already in use. The MINUTES-TO-WAIT-FOR-VOLSERS-TO-FREE-UP parameter allows users to specify that they would like the conversion job to wait the specified number of minutes for the volume to become available before rejecting it because it is already in use.

Using More Than One Input Device

By default, Tape/Copy will allocate one tape drive for the input tapes and one tape drive for the output tapes, and retain those same drives for the duration of the conversion job. However when using the Tape/Copy INTERNAL EXCP copy engine, the CONVERSION-JOB-MAX-INPUT-DEVICES parameter can be used to allow input tapes requiring more than one input device type to go into a single conversion job. When the parameter value is set to more than one, Tape/Copy will allow up to that number of input devices in a single conversion job, building a separate input DD statement for each required tape device.

Erasing Previously Written Data the Output Tape

Tape/Copy conversion jobs can (optionally) use the Data Security Erase (DSE) channel command to erase previous data on the output tape, that is past the end of the last written output dataset written by the conversion job. This feature can be used to make any data previously written to the tape unreadable. The feature is controlled by the ERASE-DATA-AT-END-OF-LAST-OUTPUT-TAPE parameter. This parameter is set to NO (do not erase data) by default but can be set to YES in the USERSETS member if the user wants to use the DSE feature to erase the data on the tape.

The erase process occurs only when Tape/Copy has finished writing the very last dataset that will go on that output tape. If stacking is used, that will be the very last output volume in the job. If stacking is not used, then it will be the last output volume of a volset. If no stacking it will be at the end of each output dataset.

Warning Different tape drive models may implement the Data Security Erase (DSE) channel command differently, and there may be differences between models from different vendors. It is possible that on some models the tape drive will not actually overwrite data, but may take another action to make it unreadable, at least under most conditions. On models that physically overwrite data on the tape, a significant amount of elapsed time may be taken to perform the erase. The conversion job will continue to run until the erase operation completes. The amount of elapsed time taken by the erase process is reported on the EXCP Analysis and Performance Reports.

Warning Users who plan to utilize this feature should verify how the DSE feature performs on their tape hardware before using this feature.

Reports Created by the Conversion Process

The following reports are generated by the conversion job, or copy operation, process unless the user chooses not to produce them by using a user parameter or by changing the ISPF panel field for that report to NO. Technical Support recommends generating all of the reports, as they are helpful to post conversion analysis of the conversion processing and for problem determination. (Not listed here, but produced by every Tape/Copy job is the Parameter Summary Report described in Chapter 8.)

- Conversion Report
- Open/Mount Information Report
- DMS/CA-Disk Update Report (produced only when processing DMS datasets)
- DFSMShsm Update Report (produced only when processing DFSMShsm datasets)
- EXCP Analysis and Performance Reports – See Chapter 13 for report sample and more information.
- Conversion Job Reblocking Report
- – See Chapter 13 for report sample and more information.
- Dataset Rejection Report
- Dataset Rejection Summary Report

- Generic EDM Update Report

Conversion Report

The Conversion Report is generated by each conversion job. This report lists all datasets that were successfully converted by Tape/Copy. The input and output tapes are listed for each converted dataset.

The STAT. (Status) fields are interpreted as follows:

abcde	*a*	Catalog status of the tape before processing	C	Cataloged	U	Uncataloged
	b	Catalog status of the tape after processing	C	Cataloged	U	Uncataloged
	c	Compression status of the tape	C	Compressed	U	Uncompressed
	d	Label status of the tape	0	Standard label (SL)	5	Leading tape mark (LTM)
			1	No label (NL)	6	ANSI label type 1 (AL1)
			2	Non-standard label (NSL)	7	ANSI user type 1 (AU1)
			3	Standard user label (SUL)	8	ANSI label type 3 (AL3)
			4	Bypass label processing (BLP)	9	ANSI user type 3 (AU3)
	e	Media type of the tape	0	3420	2	3490
			1	3480	3	3590

```
REL x.x.x  PTF x                                   T A P E / C O P Y                                    PROGRAM OTTC0003

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION REPORT FOR OPENTECH_SYSTEMS,INC.                                PAGE      1

                                                                   INPUT FILE(S)-----------+ OUTPUT FILE(S)----------+
 DATASET NAME-----------------------------+ LRECL  BLKSZE RETENTION TYPE VOLSER  SEQ STAT. BLK CNT VOLSER  SEQ STAT. BLK CNT

 OT.STACK.CNTL.CA11605V.D2002311.T145301       STACK RETENTION CONTROL DATASET REQUESTED            001098    1  C          0

 OT.APPLA.DATA0006.MFMV.FILE01                  100    1000 2008.112       001029    1 UUC02    2000 001098    2 UUC02    2000
                                                                           001030    1
 OT.APPLA.DATA0006.MFMV.FILE02                  100    1000 2008.112       001030    2 UUC02    2000 001098    3 UUC02    2000
                                                                           001031    2
 OT.APPLA.DATA0006.MFMV.FILE03                  100    1000 2008.112       001031    3 UUC02    2000 001098    4 UUC02    2000
                                                                           001032    3
 OT.APPLA.DATA0006.MFMV.FILE04                  100    1000 2008.112       001032    4 UUC02    2000 001098    5 UUC02    2000
                                                                           001033    4
 OT.APPLA.DATA0006.MFMV.FILE05                  100    1000 2008.112       001033    5 UUC02    2000 001098    6 UUC02    2000
                                                                           001034    5
 OT.APPLA.DATA0006.MFMV.FILE06                  100    1000 2008.112       001034    6 UUC02     600 001098    7 UUC02     600
                                                                           001035    6
                                                                           001036    6
 OT.APPLA.DATA0005.MFMV.FILE01                  100    1000 2005.285       001090    1 UUC02    1000 001098    8 UUC02    1000

TAPES SUCCESSFULLY CONVERTED:  READ:      9     WRITTEN:       1     TOTAL FILES CONVERTED:      7
```

Open/Mount Information Report

The conversion job Open/Mount Information Report provides performance information on all input tape and output tape(s) tape mounts and dataset Opens that did not result in a tape mount (dataset was stacked onto a tape that was already mounted). It lists each tape mount and dataset Open and gives the elapsed time it took to complete. This allows the customer to see how much time in a conversion job was spent waiting for a tape mount or dataset Open. It can help identify types of mounts that may be causing a problem: specific tape libraries, VTSs or tape devices, and can show the benefits that could be realized by pre-staging datasets into VTS cache.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                          PROGRAM OTTC0003

DATE:  xx/xx/xxxx    TIME:  xx:xx:xx     OPEN/MOUNT INFORMATION REPORT FOR OPENTECH_SYSTEMS,_INC.                      PAGE      1

  THE OPEN/MOUNT REPORT DISPLAYS INFORMATION ABOUT EACH DATASET OPEN (WHETHER IT CAUSED A TAPE MOUNT OR NOT)
  AND EACH EOV, FOR THE INPUT AND OUTPUT TAPES IN THE CONVERSION JOB. THE REASON FIELD INDICATES THE TYPE OF
  EVENT: OPN/MNT INDICATES AN OPEN THAT CAUSED A MOUNT, OPN/NO IS AN OPEN THAT DID NOT CAUSE A MOUNT (THE
  TAPE WAS ALREADY MOUNTED), AND EOV/MNT MEANS AN EOV    THAT CAUSED THE NEXT VOLUME TO BE MOUNTED

 DATASET NAME-----------------------------+ DDNAME   VOLSER  REASON  VOLSEQ   OPEN/MOUNT TIME

 OT.RELTEST.SZ14.FDR.SFSV.DATASET            TAPEIN   001398  OPN/MNT      1   HOURS 00 MINS 02.968 SECS
 OT.RELTEST.SZ14.FDR.SFSV.DATASET            TAPEOUT  001176  OPN/MNT      1   HOURS 00 MINS 03.748 SECS
   **** DATASET NUMBER     1   ACTUAL MOUNTS:     2                               HOURS 00 MINS 06.716 SECS

 OT.RELTEST.SZ14.DFDSS.DATASET               TAPEIN   001399  OPN/MNT      1   HOURS 00 MINS 04.142 SECS
 OT.RELTEST.SZ14.DFDSS.DATASET               TAPEOUT  001177  OPN/MNT      1   HOURS 00 MINS 04.595 SECS
   **** DATASET NUMBER     2   ACTUAL MOUNTS:     2                               HOURS 00 MINS 08.737 SECS

 JOB END OPEN AND MOUNT TIME SUMMARY

 TOTALS FOR PHYSICAL MOUNTS
 DDNAME   OPNS/MNTS TOTAL OPEN MOUNT TIME          AVG OPEN MOUNT TIME

 TAPEIN       2 00 HOURS 00 MINS 07.110 SECS    00 HOURS 00 MINS 03.555 SECS
 TAPEOUT      2 00 HOURS 00 MINS 08.343 SECS    00 HOURS 00 MINS 04.171 SECS
 TOTALS       4 00 HOURS 00 MINS 15.453 SECS    00 HOURS 00 MINS 03.863 SECS

 TOTALS FOR OPENS WITHOUT PHYSICAL MOUNTS
 DDNAME   OPNS/MNTS TOTAL OPEN MOUNT TIME          AVG OPEN MOUNT TIME

 TAPEIN       0 00 HOURS 00 MINS 00.000 SECS    00 HOURS 00 MINS 00.000 SECS
 TAPEOUT      0 00 HOURS 00 MINS 00.000 SECS    00 HOURS 00 MINS 00.000 SECS
 TOTALS       0 00 HOURS 00 MINS 00.000 SECS    00 HOURS 00 MINS 00.000 SECS

 TOTALS FOR PHYSICAL MOUNTS AND OPENS WITHOUT MOUNTS
 DDNAME   OPNS/MNTS TOTAL OPEN MOUNT TIME          AVG OPEN MOUNT TIME

 TAPEIN       2 00 HOURS 00 MINS 07.110 SECS    00 HOURS 00 MINS 03.555 SECS
 TAPEOUT      2 00 HOURS 00 MINS 08.343 SECS    00 HOURS 00 MINS 04.171 SECS
 TOTALS       4 00 HOURS 00 MINS 15.453 SECS    00 HOURS 00 MINS 03.863 SECS
```

DMS/CA-Disk Update Report

The DMS/CA-Disk Update Report is produced by Tape/Copy conversions jobs when DMS/CA-View datasets are processed. This report details the changes that were made to the DMS Files dataset. Also, if some type of failure occurs during the conversion and "reset" occurs, this report will also contain the changes that were made as part of the recovery process.

Warning See Chapter 4 for general and cautionary information regarding the conversion of DSM/CA-View datasets.

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTC0003

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DMS/CA-DISK UPDATE REPORT FOR OPENTECH_SYSTEMS,INC                              PAGE      1

                                        FROM    TO
 ---------------------------------      ------ ------   ---------------------------------------------------------------

 DMS/CA-DISK TAPE FILE COPIED           000024 000026   DSN=DMS.ARCHPRIM.DMSN.S2004190.T083031

 -CREATING TARGET ARCHVOLS RECORD       000024 000026

 -SEARCHING FOR CHAINED ARCHVOLS

 -SEARCHING FOR DSNARKEY MATCH
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.ATLNMWK1
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.ATLNMWK2
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.DVRECS
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.EDGHSKP.MESSAGE
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP.FILTERED
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP.SORTED
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP.SORTED2
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP.SUMMED
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP.VOLCHAIN
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.TMCDUMP.VOLFILE
 -UPDATING DSNINDEX DSNARKEY VALUE      000024 000026   DSNX=OT02.VTARB2.VOLCHAIN

 -DELETING SOURCE ARCHVOLS RECORD       000024

 ---------------------------------      ------ ------   ---------------------------------------------------------------

 DMS/CA-DISK TAPE FILE COPIED           000058 000065   DSN=DMS.ARCHPRIM.DMSN.S2004189.T112830

 -CREATING TARGET ARCHVOLS RECORD       000058 000065

 -SEARCHING FOR CHAINED ARCHVOLS
 -UPDATING ARCHVOLS ARCKEYCH VALUE      000058 000065   ARCV=000056

 -SEARCHING FOR DSNARKEY MATCH

 -DELETING SOURCE ARCHVOLS RECORD       000058

 ---------------------------------      ------ ------   ---------------------------------------------------------------

 DMS/CA-DISK TAPE FILE COPIED           000022 000028   DSN=DMS.ARCHCOPY.DMSN.S2004190.T075547

 -CREATING TARGET ARCHVOLS RECORD       000022 000028

 -SEARCHING FOR CHAINED ARCHVOLS
 -UPDATING ARCHVOLS ARCCPYKY VALUE      000022 000028   ARCV=000021

 -DELETING SOURCE ARCHVOLS RECORD       000022

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

DFSMShsm Update Report

The DFSMShsm Update Report is produced by Tape/Copy conversion jobs when DFSMShsm datasets are processed. This report shows the input and output data sets (and, in the case of a Dual Copy Recovery, the Dual Copy backup dataset). The report also shows the results of HSM LIST TTOC commands issued against the input tape volume before the HSM update and the output tape volume after the HSM update.

Warning See Chapter 4 for general and cautionary information regarding the conversion of DFSMShsm datasets.

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTC0003

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DFSMSHSM UPDATE REPORT FOR OPENTECH_SYSTEMS,_INC.                                PAGE      1

                DATA SET NAME                                    VOLSER
                +----------------------------------------+ +----+
  INPUT:        HSM.BACKTAPE.DATASET                             000051
  OUTPUT:       HSM.BACKTAPE.DATASET                             000053

 --- LIST TTOC ORIGINAL VOLUME BEFORE HSM UPDATE -------------------

 LIST TTOC(000051) NODSI ODS(OT10.OTSCLMTC.JOB02469.DFHSMODS             )

 - DFSMSHSM CONTROL DATASET - TAPE VOLUME TTOC - LISTING - AT 18:32:31 ON 03/11/23 FOR SYSTEM=ZO12

 VOLSER    UNIT    VOL      REUSE     VALID   PCT    VOL    RACF  PREV    SUCC    NUM  ONE   ALT     LIB       STORAGE
           NAME    TYPE   CAPACITY    BLKS    VALID  STATUS       VOL     VOL     REC  FILE  VOL                GROUP
 000051    3490    D(01)  00020400  00025213  100    FULL    NO   *NONE*  000052  001  YES   *NONE*  *NO LIB*  **NO SG*
 ----- END OF - TAPE VOLUME TTOC   - LISTING -----

 --- LIST TTOC ALTERNATE VOLUME AFTER HSM UPDATE -------------------

 LIST TTOC(000053) NODSI ODS(OT10.OTSCLMTC.JOB02469.DFHSMODS             )

 - DFSMSHSM CONTROL DATASET - TAPE VOLUME TTOC - LISTING - AT 18:32:37 ON 03/11/23 FOR SYSTEM=ZO12

 VOLSER    UNIT    VOL      REUSE     VALID   PCT    VOL    RACF  PREV    SUCC    NUM  ONE   ALT     LIB       STORAGE
           NAME    TYPE   CAPACITY    BLKS    VALID  STATUS       VOL     VOL     REC  FILE  VOL                GROUP
 000053    3490    D(01)  00020400  00025213  100    FULL    NO   *NONE*  000052  001  YES   *NONE*  *NO LIB*  **NO SG*
 ----- END OF - TAPE VOLUME TTOC   - LISTING -----

REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM XDCCALLA

0DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DFSMSHSM UPDATE REPORT FOR OPENTECH_SYSTEMS,_INC.                                PAGE      2

                DATA SET NAME                                    VOLSER
                +----------------------------------------+ +----+
  INPUT:        HSM.BACKTAPE.DATASET                             000052
  OUTPUT:       HSM.BACKTAPE.DATASET                             000054

 --- LIST TTOC ORIGINAL VOLUME BEFORE HSM UPDATE -------------------

 LIST TTOC(000052) NODSI ODS(OT10.OTSCLMTC.JOB02469.DFHSMODS             )

 - DFSMSHSM CONTROL DATASET - TAPE VOLUME TTOC - LISTING - AT 18:35:15 ON 03/11/23 FOR SYSTEM=ZO12

 VOLSER    UNIT    VOL      REUSE     VALID   PCT    VOL    RACF  PREV    SUCC    NUM  ONE   ALT     LIB       STORAGE
           NAME    TYPE   CAPACITY    BLKS    VALID  STATUS       VOL     VOL     REC  FILE  VOL                GROUP
 000052    3490    D(01)  00020400  00015586  077    PART    NO   000053  *NONE*  001  YES   *NONE*  *NO LIB*  **NO SG*
 ----- END OF - TAPE VOLUME TTOC   - LISTING -----

 --- LIST TTOC ALTERNATE VOLUME AFTER HSM UPDATE -------------------

 LIST TTOC(000054) NODSI ODS(OT10.OTSCLMTC.JOB02469.DFHSMODS             )

 - DFSMSHSM CONTROL DATASET - TAPE VOLUME TTOC - LISTING - AT 18:35:21 ON 03/11/23 FOR SYSTEM=ZO12

 VOLSER    UNIT    VOL      REUSE     VALID   PCT    VOL    RACF  PREV    SUCC    NUM  ONE   ALT     LIB       STORAGE
           NAME    TYPE   CAPACITY    BLKS    VALID  STATUS       VOL     VOL     REC  FILE  VOL                GROUP
 000054    3490    D(01)  00020400  00015586  077    PART    NO   000053  *NONE*  001  YES   *NONE*  *NO LIB*  **NO SG*
 ----- END OF - TAPE VOLUME TTOC   - LISTING -----
                         END OF REPORT
```

Conversion Job Reblocking Report

The Conversion Job Reblock Report is produced by the Tape/Copy conversion job when the OUTPUT-FILE-REBLOCKING parameter is set to a value other than NONE. This report shows the blocksize values and limits that were in effect at the time the conversion job's reblocking functions are performed. It will also list a reason code for datasets that have not been reblocked during conversion.

Note See Chapter 16 for more information on Output File Reblocking.

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION JOB REBLOCK REPORT FOR OPENTECH_SYSTEMS,_INC.                        PAGE      1


   BLKSIZE VALUES AND LIMITS USED IN DETERMINING THE MAXIMUM BLKSIZE ALLOWED

 ALLOW-REBLOCKING-OF-UNBLOCKED-FILES:       NO
       REBLOCK-MAX-BLKSIZE USER PARM:    44500
      DISKOUT DEVICE OPTIMUM BLKSIZE:    27998   MAXIMUM BLKSIZE:    32760
  ------> CONVERSION JOB MAX BLKSIZE:    27998


 ***************************************************************************************************************************
 *  RCDE (REASON CODE): WHETHER DATASET WAS REBLOCKED OR IF NOT, WHY NOT
 *   Y - THE DATASET WAS REBLOCKED AS REQUESTED
 *   1 - DATASET NOT REBLOCKED, PER USER SELECTION CRITERIA
 *   2 - DATASET NOT REBLOCKED, INPUT BLKSIZE = 0
 *   3 - DATASET NOT REBLOCKED, RECFM=U
 *   4 - DATASET NOT REBLOCKED, LRECL=0
 *   5 - DATASET NOT REBLOCKED, INPUT BLKSIZE >= REBLK MAX BLKSIZE
 *   6 - DATASET NOT REBLOCKED, INPUT BLKSIZE > USER VALUE
 *   7 - DATASET NOT REBLOCKED, NEW BLKSIZE = OLD (REFCM=F)
 *   8 - DATASET NOT REBLOCKED, RECFM IS UNKNOWN
 *   9 - DATASET NOT REBLOCKED, NEW BLKSIZE < LRECL
 *   A - DATASET NOT REBLOCKED, INPUT NOT BLOCKED, ALLOW-REBLOCKING WAS SET TO NO
 ***************************************************************************************************************************


 INPUT DATASET NAME (TAPE) ----------------+   BLKSZE RECFM RCDE  CANDSEL OUTPUT DATASET NAME (DISK) ----------------+  BLKSZE RECFM

 OT.VDRLA.V000026.F0001.A0004.MFSV.FILE01        32000   FB    Y     22000 OT.APPLA.SZ12.DATA0004.MFSV.FILE01             22000   FB
 OT.VDRLA.V000026.F0002.A0004.MFSV.FILE02        32000   FB    Y   6018000 OT.APPLA.SZ12.DATA0004.MFSV.FILE02             27000   FB
 OT.VDRLA.V000026.F0003.A0004.MFSV.FILE03        32000   FB    Y   OPTIMUM OT.APPLA.SZ12.DATA0004.MFSV.FILE03             27000   FB
 OT.VDRLA.V000026.F0004.A0004.MFSV.FILE04        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE04             32000   FB
 OT.VDRLA.V000026.F0005.A0004.MFSV.FILE05        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE05             32000   FB
 OT.VDRLA.V000026.F0006.A0004.MFSV.FILE06        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE06             32000   FB
 OT.VDRLA.V000026.F0007.A0004.MFSV.FILE07        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE07             32000   FB


 JOB END SUMMARY FOR DATASETS REBLOCKED


                 DATASETS REBLOCKED:        3

   AVERAGE BLKSIZE BEFORE REBLOCKING:    32000

    AVERAGE BLKSIZE AFTER REBLOCKING:    25333
```

Dataset Rejection Report

The Data Set Rejection Report for the conversion process has the same format as the rejection report generated by Candidate Selection (See Chapter 9). This report lists any datasets that the conversion job was unable to successfully process and is a very useful tool for problem determination. This report provides a listing of files that were not copied successfully by the copy operation, and provides the reason that they were not converted.

```
RELEASE x.x.x  PTF LEVEL x                                T A P E / C O P Y                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx  TIME:  xx:xx:xx    DATA SET REJECTION REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE   1

MSGID  DATASET NAME                                  VOLSER  REJECTION REASON

M0211  OT01.DZ1.TEST                                 032003  TAPE ABENDED DURING CONVERSION - SEE JOB LOG FOR SPECIFIC DETAILS
M0203  OT01.DZ1.TEST                                 020001  ABEND RECOVERY - OUTPUT TAPE DATASET IS NOT OPEN
M0205  OT01.DZ1.TEST                                 032003  ABEND RECOVERY - INPUT TAPE DATASET IS CLOSED
M0206  OT01.DZ1.TEST                                 032003  ABEND RECOVERY - INPUT TAPE DATASET IS RESTORED TO ORIGINAL SYSTEM
M0207  OT01.DZ1.TEST                                 032003    CATALOG STATUS
M0208  OT01.DZ1.TEST                                 032003  ABEND RECOVERY - INPUT TAPE DATASET IS RESTORED TO ORIGINAL TAPE
M0209  OT01.DZ1.TEST                                 032003    MANAGEMENT CATALOG STATUS
M0210  OT01.DZ1.TEST                                 032003  ABEND RECOVERY - AUDIT FILE UPDATED
M0090  OT01.DZ1.TEST                                 032003  SUCCESSFULLY RECOVERED CATALOGED INPUT TAPE DATASET
```

Dataset Rejection Summary Report

The Data Set Rejection Summary Report provides a summary of the rejection reasons produced by the Data Set Rejection Report and shows how many times each rejection message was issued.

```
REL x.x.x  PTF x                                          T A P E / C O P Y                                PROGRAM OTTC0003

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DATASET REJECTION SUMMARY REPORT FOR OPENTECH_SYSTEMS,_INC.PAGE      1

MSGID  MESSAGE COUNT  REJECTION REASON

M0090            2    SUCCESSFULLY RECOVERED CATALOGED INPUT TAPE DATASET
M0203            1    ABEND RECOVERY - OUTPUT TAPE DATASET IS NOT OPEN
M0206            1    ABEND RECOVERY - INPUT TAPE DATASET IS RESTORED TO ORIGINAL SYSTEM
M0207            1      CATALOG STATUS
M0208            1    ABEND RECOVERY - INPUT TAPE DATASET IS RESTORED TO ORIGINAL TAPE
M0209            1      MANAGEMENT CATALOG STATUS
M0210            1    ABEND RECOVERY - AUDIT FILE UPDATED
M0211            1    TAPE ABENDED DURING CONVERSION - SEE JOB LOG FOR SPECIFIC DETAILS
M0212            1    ABEND RECOVERY - INPUT TAPE DATASET IS NOT OPEN
```

Note Explanations of the Tape/Copy rejection message codes can be found in the Tape/Copy "Messages & Codes Guide".

Generic EDM Update

The Generic EDM Update functions will produce a report at the end of the Tape/Copy/VDR Conversion functions, showing all of the Generic EDM tapes recovered. The EDM flags/fields supported by the customers TMS are copied from the GDM Input Volume(s) to the GDM Output Volume(s). Once the EDM flags/fields have been propagated from the input to the output volumes successfully, the EDM related data is removed from the Input Volumes TMC records and the expiration date of the Input Volume is set to Permanent.

```
REL X.X.X  PTF X                                      T A P E / C O P Y                                OTTC0003 JOBXXXXX
DATE:  MM/DD/YYYY   TIME:  HH:MM:SS     GENERIC EDM UPDATE REPORT FOR                                       PAGE NNNNNN

                DATA SET NAME                                    VOLSER
                +----------------------------------------+ +----+
 GDM INPUT:     OT.XXXXX.DATA0001.SFSV.DATASET                   V00124
 DUAL COPY:     VDR1.XXXXX.VV00124.F0001.A0001.SFSV.DATASET      V00157
 GDM OUTPUT:    OT.XXXXX.DATA0001.SFSV.DATASET                   V00251

                DATA SET NAME                                    VOLSER
                +----------------------------------------+ +----+
 GDM INPUT:     OT.XXXXX.DATA0002.SFMV.DATASET                   V00129
 DUAL COPY:     VDR1.XXXXX.VV00129.F0001.A0002.SFMV.DATASET      V00157
 GDM OUTPUT:    OT.XXXXX.DATA0002.SFMV.DATASET                   V00259

                DATA SET NAME                                    VOLSER
                +----------------------------------------+ +----+
 GDM INPUT:     OT.BEDM1.DATA0003.SFMV.DATASET                   V00134
 DUAL COPY:     VDR1.BEDM1.VV00134.F0001.A0003.SFMV.DATASET      V00157
 GDM OUTPUT:    OT.BEDM1.DATA0003.SFMV.DATASET                   V00292
```

How Tape/Copy Handles Failed Conversions

During the conversion process, errors or undesirable conditions may occur that can prevent the successful conversion of a tape file. The errors encountered by the conversion job can be either logical/environmental errors detected through validity checks or return codes, or abends intercepted by the ESTAE routine. In either case, a clean up routine is called to correct tape management catalog (and system catalog, if necessary) and back off the conversion to maintain the input tape's integrity.

When errors or unusual conditions are detected during a conversion job, Tape/Copy:

1. notifies the user by issuing WTOs to the system console and/or generates a Data Set Rejection Report.
2. attempts to clean up and recover from the condition.
3. determines whether or not the conversion job can continue processing with the volume set after the volume set that encountered the error. (If clean up was successful and the error condition does not prevent the conversion job from continuing, Tape/Copy will continue copying with the next volset.).

Canceling Tape/Copy Conversion Jobs

OpenTech Systems does not recommend canceling Tape/Copy conversion jobs unless absolutely necessary. A Console Command interface is provided that allows user's to issue halt commands to Tape/Copy conversion jobs to stop them rather than canceling them. See Chapter 15 for more information on the Console Command interface feature.

By default, Tape/Copy does not attempt recovery for conversion jobs that are canceled by an operator (S122 or S222). The CNV-JOB-RESET-AFTER-OPERATOR-CANCEL can be modified (set to YES) to cause Tape/Copy to attempt to recover when a conversion job is canceled and the ESTAE routine is active. This parameter is set to NO by default.

ESTAE Routine for Handling Abends

An ESTAE routine is an MVS facility which allows a program to get control when an abend occurs, so that it can handle that condition. Tape/Copy conversion jobs use an ESTAE routine for that purpose.

The following is a brief overview of the actions the Tape/Copy ESTAE routine performs when an abend occurs.

1. Tape/Copy issues a WTO to indicate the ESTAE routine was entered. This WTO provides the abend code and reason code of the abend.
2. Diagnostic data is gathered about the abend and the state of the conversion job at the time of the abend.
3. A small SNAP dump (DD=OTSNAP1) is generated giving the state of the conversion job at the time of the error. This dump will often contain everything needed by Technical Support to diagnose the problem, and it is easy to transmit.
4. A full SNAP dump (DD=OTSNAP2) is generated, with added MVS data, or an entire SYSUDUMP is generated, depending on the abend type and the user setting for obtaining a full dump. This dump may be needed by Technical Support to diagnose the problem.
5. Tape/Copy decides whether the failing volser should be added to the BADMEDIA member of the Tape/Copy PARMLIB library. (See the “Bad Media” section for conditions that cause a tape to be placed into the BADMEDIA member.) If Tape/Copy determines that the volser should be added to BADMEDIA, it will be added to BADMEDIA later by the RESET routine.
6. Tape/Copy calls the RESET routine to do clean up processing. (See the “RESET Routine” section for more information.)
7. The ESTAE routine determines whether the conversion job can continue processing with the next volume set. If any of the follow conditions are met, the Tape/Copy conversion job **will not** continue:
   - The process abended with a x22 abend (i.e. - S222, S522, etc.). In some x22 abends, the operating system prohibits the job from continuing. Their is a parameter (CNV-JOB-RESET-AFTER-OPERATOR-CANCEL) available that can be used to tell Tape/Copy to attempt recovery in cases where the job is operator cancelled. See parameter description for details.
   - The process abended with a S0Cx abend (except for a S0C7).
   - The process abending was the second consecutive OPEN abend on an input file.
   - The process abended with a S913 abend, security access or authorization failure.
   - The Tape/Copy conversion job is performing a stack/move function (OUTPUT-FILE-FORMAT: STACK and DATA-COPY-FUNCTION: MOVE)
8. If the ESTAE routine determines that the Tape/Copy conversion job can continue processing with the next volume set, a WTO is issued to alert the user that Tape/Copy will attempt to continue processing with the first tape of the next volume set.

RESET Routine for Cleaning Up Failures

Whether called by the ESTAE routine or outside of ESTAE, the RESET routine performs clean up functions to reset the input tapes of a failed copy operation to there original status (the way they were before the copy began).

The following is a brief description off the RESET routine processing.

1. Tape/Copy issues a WTO (OT000133E) to indicate that the RESET routine has been entered.
2. If the Reset routine was not entered by the ESTAE routine (which produces its own snap dump), a snap dump will be taken to assist in diagnosing any problems.
3. If the ESTAE routine had determined that the failing volser needs to be added to the BADMEDIA member, the RESET routine adds the volser to the member and issues a WTO to notify the user. (See the “Bad Media” section for conditions that cause a tape to be placed into the BADMEDIA member.)
4. The Input and Output tapes are both closed (if open).
5. The Input tape datasets are restored to their original system catalog status.
6. Tape/Copy updates the tape management system resetting the input records back to their original status.
7. If the DATA-COPY-FUNCTION parameter was set to MOVE, then the Tape/Copy Audit Log File is updated with the output tape audit records.
8. If the OUTPUT-ABEND-SCRATCH-DAYS parameter was set to a value other than “NONE”, the output volume set’s retention will be reset to allow the output tape from the failed conversion to be scratched by the tape management systems’ scratch process.

Note If any error is encountered during Tape/Copy’s attempt to recover and clean up, a WTO is issued and the conversion job is terminated.

“Bad Media”

In order to prevent Tape/Copy from re-selecting tapes that have caused a previous conversion failure, Tape/Copy maintains a list of “bad media” in the BADMEDIA member of the Tape/Copy PARMLIB library. The volser, abend code, reason code date and time of the media error are all recorded.

The following conditions cause a tape volser to be added to the BADMEDIA member:

- The EXCP engine encountered an I/O error (Data Check) on an input tape.
- A non-EXCP engine appears to have encountered an I/O error on the input tape.
- Any Open abend on the input tape (except a S413-04).
- An S013-10 abend on the input tape.
- The volser field in the trailer label of the first file of a volume set does not match the volser the copy was started from (unless the ALLOW-MISSING-INPUT-DATASET-VOLUME parameter was set to YES). **This condition is only detectable by Tape/Copy when using the EXCP copy engine**.
- The trailer label at the end of the last volume Tape/Copy was aware of has “EOV” and not “EOF”, suggesting that there might be another volume (unless the ALLOW-MISSING-INPUT-DATASET-VOLUME parameter was set to YES). **This condition is only detectable by Tape/Copy when using the EXCP copy engine**.
- There were not two tapemarks after the end of the last dataset in the volume set (unless the BYPASS-END-OF-VOLSET-TEST parameter was set to YES). **This condition is only detectable by Tape/Copy when using the EXCP copy engine**.

- A block encountered on the input tape exceeded the maximum length: Greater than 64K if LBI is not supported on the system and 256K if LBI is supported. **This condition is only detectable by Tape/Copy when using the EXCP copy engine**.
- Any BDW (Block Descriptor Word) error was encountered while reading an input tape with RECFM=V/VB (unless the EXCP-BYPASS-SPECIAL-RECFMVB-HANDLING parameter was set to YES). **This condition is only detectable by Tape/Copy when using the EXCP copy engine**.

Tape/Copy/Advanced Recall Interface

The feature outlined in this section is only available to users who have installed and licensed the Advanced Recall product (a separately priced OpenTech Systems, Inc. product).

The Advanced Recall interface is the method by which Tape/Copy conversion jobs produce a list of the input virtual tape volsers and pass that list to Advanced Recall. Advanced Recall can then recall those volumes that are not already in the virtual tape cache, so that the volumes are readily available to be processed by the Tape/Copy conversion job. This interface will allow the Tape/Copy conversion job to avoid many of the delays caused by recall processing.

The Advanced Recall interface can be used with any conversion job that will be processing virtual tape volumes, including standard Tape/Copy conversion jobs, VDR conversion jobs creating Dual Copy backups, and Newname conversion jobs.

The Advanced Recall Candidate file that is created by the Tape/Copy conversion job contains a record for the first volume of each multi-volume set to be processed by the conversion job. The Advanced Recall Candidate file record contains the volser, blanks in the dataset name field and the conversion jobname in the requesting job field. The requested date/time fields are populated based on the current date/time plus 30 seconds for each volser to be processed. The conversion job will pass the generated Advanced Recall Candidate file to the Advanced Recall task via the Advanced Recall LOADQFILE command.

Note For more information about the Advanced Recall Candidate file, see the Advanced Recall User Guide.

Configuring the Tape/Copy/Advanced Recall Interface

Since not all Tape/Copy users are also licensed to use the Advanced Recall product, the Advanced Recall interface is turned “off” by default. In order for this feature to be used, two Tape/Copy parameters must be configured.

USE-ADVR-INTERFACE

The USE-ADVR-INTERFACE parameter specifies whether or not Tape/Copy should use the Advanced Recall interface. If this parameter is set to YES, the ADVR-ROUTING-FILE-NAME parameter discussed below must be set to a valid routing file value. If this parameter is set to NO, the Advanced Recall interface is not used and the virtual volumes required by the Tape/Copy conversion job will not be recalled in advance if they are not in virtual cache. The volumes will need to be recalled when requested by the conversion job.

The USE-ADVR-INTERFACE parameter is set to NO by default, but it can be added to the USERSETS member of the Tape/Copy PARMLIB to set the value to YES and override the DEFAULTS value. The parameter can also be set using the “Use Advanced Recall:” field on the Conversion Job Parameters panel.

The Conversion Job Parameters panel is accessed through the following Tape/Copy and VDR options:

- Mass Copy Panel Option
- ACS Copy
- Dual Copy Creation ISPF Panel Option (VDR users only)
- Mass Newname Creation ISPF Panel Option (VDR users only)

ADVR-ROUTING-FILE-NAME

The ADVR-ROUTING-FILE-NAME parameter should be set to the user’s Advanced Recall dynamic allocation prefix value (from the DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX parameter in the Advanced Recall libraries NOT the parameter value in Tape/Copy), “.ROUTING.INFO” in the USERSETS member of the Tape/Copy PARMLIB.

For example: If the Advanced Recall DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX parameter is set to “OT.ADVR”, then the ADVR-ROUTING-FILE-NAME **parameter should be set to “OT.ADVR.ROUTING.INFO” in the Tape/Copy USERSETS member.**

If the ADVR-ROUTING-FILE-NAME is set to NONE, the Advanced Recall interface is not used (and the ISPF panel option for the USE-ADVR-INTERFACE parameter will not be available).

Note When using the Advanced Recall interface, Advanced Recall may have a volume allocated for a brief period of time when the conversion job is requesting it. The MINUTES-TO-WAIT-FOR-VOLSERS-TO-FREE-UP parameter should be set to a value other than 0 (the default) to allow the conversion job to wait for Advanced Recall to release its “hold” on the volume.

Setting VTS Advanced/Outboard Policy Management Values

The VTS Outboard Policy Management (OPM) classes are used to tell the VTS how each virtual volume should be managed (should the volume be dual copied, deleted from tape cache, retained using the LRU algorithm, etc.) Tape/Copy provides a method for allowing the user to set the OPM class of the input tape as part of the conversion process using the following parameters:

- SET-IBM-VTS-OPM-DATACLAS
- SET-IBM-VTS-OPM-MGMTCLAS
- SET-IBM-VTS-OPM-STORCLAS
- SET-IBM-VTS-OPM-STORGRP

When any of these parameters are set to a value other than NONE, the Tape/Copy conversion engine will set the associated VTS OPM class to the specified value for input tapes just before the datasets on those tapes are opened. (The VTS OPM class for Tape/Copy output tapes should be set using SMS constructs as would be done for any other output files.)

Note This feature is only available for users of IBM LCS z1.3 and up.

One specific application for this feature is to use the SET-IBM-VTS-OPM-STORCLAS parameter to set the VDR input tapes to a PG0 OPM storage class so that they can be migrated immediately after the VDR Dual Copy backup has been created, rather than keeping the PG1 OPM storage class originally assigned to keep the data in virtual tape cache.

Using the “set OPM class” parameters, the OPM value is set prior to actual Tape/Copy conversion processing, therefore a failure during processing does not cause the value to be returned to its original value. The original OPM values are not “reset” by failed conversion recovery.

Bulk Volume Information Retrieval (BVIR) Support

Tape/Copy is able to use Bulk Volume Information Retrieval (BVIR) to gather IBM and STK virtual tape volume information and sort the conversion job's control records (generated by the candidate selection process) by physical volser, and group the backend volumes together. This feature can reduce the mount times when processing many tapes from a virtual tape system (such as, during a migration project) by allowing the Tape/Copy job to process datasets in backend volume order.

During installation, if Tape/Copy detects the presence of an IBM and/or STK virtual tape library, the SETUP Utility will update the BVIRBASE member of the Tape/Copy PARMLIB with the VTS information. The BVIRBASE member is updated regardless of whether or not the BVIR support will be used.

In order to utilize this feature, the user needs to customize and submit JCL to dump, build, and update the BVIR database. There are two jobs available: BLDBVIRD for IBM virtual tape users, and BVIRBLDS for STK virtual tape users.

IBM Virtual Tape Users

For IBM virtual tape users, the JCL is located in the BLDBVIRD member of the Tape/Copy JCLLIB. The BLDBVIRD job will read the VTS information in the BVIRBASE PARMLIB member and generate a job to invoke the BVIR retrieval function that captures the Volume Map data for each VTS listed. The job generated by the BLDBVIRD JCL is a two-step process.

- The first step will write the required BVIR control statements to a scratch tape and dump the BVIR data. The output dataset allocated by this step of the dump process will be named so that the last node of the dataset is the name of the VTS being dumped. This step must contain the following BVIR control statements in the BVIRCNTL DD:

  ```
  VTS BULK VOLUME DATA REQUEST

  VOLUME MAP
  ```

- The second step will read the Volume Map data from the first step and load it into a Tape/Copy VSAM database for reference by Tape/Copy jobs. The dataset name for the VSAM database is set using the DYNAMIC-ALLOCATION-BVIRVSAM-DATASET-NAME-PREFIX parameter. This step verifies that the logical volsers on each dump tape exist in the VTS identified by the dataset name created in the first step.

Note When running on JES2, the job generated by BLDBVIRD will be a single job with two job steps. When running on JES3 the job steps described above are submitted as two separate jobs (rather than one job with two steps). Both jobs will use the same job name and job cards to ensure serialization.

STK Virtual Tape Users

For STK virtual tape users, the BVIR build/update JCL is located in the BVIRBLDS member of the Tape/Copy JCLLIB. The BVIRBLDS job includes a sample STK utility program, SWSADMIN, which executes the MVCRPT utility function with its output directed to a disk dataset (of which the last node must be STKVSM). The report generated by MVCRPT is then parsed and the extracted data is loaded into the BVIR database, identified by the DYNAMIC-ALLOCATION-BVIRVSAM-DATASET-NAME-PREFIX parameter.

Scheduling Frequency

The volume information obtained from the dump function of the BVIR facility is a snapshot taken at a point in time and is not "real time" data. Therefore, the data in the VSAM database(s) created by Tape/Copy may not be 100% accurate. Running the BLDBVIRD and/or BVIRBLDS job regularly will update the database and improve the accuracy of the information. The frequency of which the job is run is up to the user. For most environments, running the update job once a day is sufficient.

In order to insure the validity of the data contained within the Tape/Copy BVIR database, Tape/Copy tracks the age of the BVIR database (based on the dump date contained in the data returned with the BVIR data). The Tape/Copy BVIR interface will capture this date and when called upon by the Tape/Copy programs, the interface will check to ensure that the data contained within the BVIR database is no more than the number of days old as

specified by the MAXIMUM-ACCEPTABLE-BVIR-DB-AGE-IN-DAYS parameter (this parameter is set to “1” by default). If the data contained in the database is too old then one or more informational messages will be issued and the Tape/Copy programs will continue execution with out the benefit of the BVIR interface.

BVIR Related Tape/Copy Parameters

Review the use of the following parameters related to BVIR processing, located in the Tape/Copy Parameter Reference Guide.

- BVIR-JOB-NAME
- BVIR-JOB-NAME-SCROLLING
- BVIR-JOB-NAME-SCROLLING-LIMIT
- DYNAMIC-ALLOCATION-BVIRVSAM-DATASET-NAME-PREFIX
- DYNAMIC-ALLOCATION-BVIRVSAM-DATA-VOLSER
- DYNAMIC-ALLOCATION-BVIRVSAM-INDEX-VOLSER
- MAXIMUM-ACCEPTABLE-BVIR-DB-AGE-IN-DAYS

Usage Considerations

When using this feature to sort the conversion job control records into a volume processing order, stacking should not be used (OUTPUT-FILE-FORMAT set to a value other than STACK). If stacking must be used, then the STACKED-OUTPUT-SORT-FIELD should be set to NONE so that the volume processing order is not changed by the other sort options.

13 Conversion Job Performance

Topics Covered In This Chapter

Tape/Copy “Copy Engines” (page 13-2)

Performance Related User Parameters (page 13-4)

SIO Appendage Module Installation Instructions (page 13-5)

Standard EXCP vs. EXCPVR (page 13-7)

Choosing Conversion Job Performance Options (page 13-9)

“Tuning” Conversion Job Performance (page 13-10)

Job Performance Reports (page 13-13)

Introduction

This chapter provides an overview discussion of the performance of Tape/Copy conversion jobs. It discusses the options and parameters that affect copy performance. Information is provided to help select the most appropriate performance options for a given purpose.

In the past, tape to tape copying was generally considered a background activity, and performance was not a major concern. With the multitude of changes in tape technology over the last few years and with the corresponding changes in how tapes are used at data centers, this is no longer the case.

The following are some of the most popular changes that have created the need for fast tape copy performance:

- Virtual tape systems implementation
- More stringent recovery and availability requirements
- Large data center consolidations
- The need to move tapes quickly from outdated equipment and technologies to newer technology

More and more companies view the ability to copy tapes at a high rate of speed as an essential requirement to meet processing windows, disaster recovery requirements and limited tape migration schedules.

Tape/Copy "Copy Engines"

History

Tape/Copy has always offered a number of different copy engines, such as SORT and IEBGENER, to be used to perform the physical tape to tape copy during conversion jobs. Originally, these "external" copy engines were used because the earliest versions of Tape/Copy did not have a proprietary, internally-developed copy engine. A number of different engines were used because no single copy engine was able to copy all types of data.

The initial version of the Tape/Copy EXCP engine came out in late 2000. The EXCP copy engine was designed specifically to handle almost every type of tape record format, and also to provide a higher level of control and recovery during the copy operation. It did away with most of the reasons one would ever have to use any of the other engines, except for when the maximum copy performance was needed. Programs such as SORT and ICEGENER (which uses DFSORT as the data mover) had been optimized to move data as fast as possible and offered a higher level of tape copying performance if they were compatible with the format of data on the tape.

While Tape/Copy's EXCP copy engine was able to move almost any data type, its performance was lower compared to other copy engines.

Current Tape/Copy EXCP Processing

Many enhancements have been made since the initial release of Tape/Copy EXCP copy engine. The Tape/Copy EXCP engine has a number of performance improvements available which allow it to meet or exceed the performance of SORT and ICEGENER. Also, the EXCP engine provides much greater control, improved error recovery and integration with Tape/Copy.

Some of the key features of the Tape/Copy EXCP copy engine are:

- Uses a larger I/O buffer (up to 6MB) in order to read and write many more blocks at a time
- Multiple channel programs using a number of techniques to maximize performance
- Can make the Tape/Copy address space non-swappable during the copy operation portion of the conversion job, allowing it to complete quickly
- Supports the IBM A60- 3590 performance enhancements, including the use of buffered tapemarks, for large reductions in elapsed time when stacking datasets
- Supports OS/390 R2.10 and z/OS Large Block Interface (LBI) which supports tape block sizes up to 256 K bytes
- Supports user-controlled skipping of unreadable input blocks during a copy operation (see Chapter 17 for more information on skipping unreadable blocks)
- Produces reports with performance data showing the options used, key factors, and MB/Sec of each copy operation
- Provides simple performance parameters, which allow a site to tailor conversion jobs to meet the needs of the data center
- Overlapping I/O balanced to achieve lowest elapsed time
- Optimizations for certain file formats and proprietary data types
- Offers a data copy engine that uses EXCPVR channel programming to the minimum. It is generally recommended that this engine be used, especially if the elapsed time of copy jobs is critical.

Warning To use the EXCPVR engine an additional installation step is required. (See SIO Appendage Module Installation Instructions.)

Performance Related User Parameters

There are a few simple performance options that control how fast a conversion will potentially run and how much system resources the conversion job will get. These parameters can be set just like all the other Tape/Copy parameters, using the USERSETS member of the Tape/Copy PARMLIB.

Warning These parameters are only applied to the conversion jobs that are using Tape/Copy EXCP copy engine, not SORT, IEBGENER or other copy engines.

EXCPVR-MODE

This parameter allows the user to specify whether the Tape/Copy EXCP copy engine will use standard EXCP or EXCPVR. By default this parameter is set to **NO**, which tells Tape/Copy to use standard EXCP copying. If set to **YES**, Tape/Copy will use the EXCPVR option.

When using EXCPVR, Tape/Copy page-fixes certain I/O areas in real storage before the copy operation begins and keeps them page-fixed for the duration of the entire physical copy operation. This page-fixing process allows Tape/Copy to complete the copy operation most efficiently. However, on memory-constrained systems page-fixing can lead to memory contention with other running jobs and possibly with the operating system itself. In almost all cases, the size of the area page fixed will be between 1 and 2 MB, and it is in storage that is above the 16 MB real and virtual lines.

Note See the “Standard EXCP vs. EXCPVR” section later in this chapter for a full discussion of EXCPVR, why it is faster than standard EXCP and for a warning of EXCPVR’s possible negative consequences.

EXCPVR mode is appropriate when the system is not memory-constrained, and/or when Tape/Copy speed is especially important, such as the following situations:

- in data recovery
- when loading a virtual tape library during a limited time window
- when tape drives are at a premium

Warning If EXCPVR-MODE is set to YES, the EXCPVR-IO-APPENDAGE-SUFFIX parameter discussed later in this chapter must also be set.

EXCPVR-NONSWAPPABLE

If EXCPVR is used, this parameter allows users to make the Tape/Copy address space non-swappable while the conversion job is running. (This would be accomplished by setting this parameter to **YES**. The parameter is set to **NO** by default.)

This option prevents the operating system from swapping the address space out once the physical copy operation has begun and will allow the job to complete in the shortest amount of time.

EXCPVR-IO-APPENDAGE-SUFFIX

If EXCPVR is used, this parameter must be set to define the SIO appendage that MVS will call when processing Tape/Copy EXCPVR requests. The appendage must be put into either the LPA or SVC library. The name of the appendage must be IGG019xx (where xx is a value from WA to Z9). This parameter tells Tape/Copy what suffix was chosen by the user for the I/O appendage we provide. The default value is ZA.

Warning Appendages must be located in the system Link Pack Area (LPA). Updates to the LPA are generally the responsibility of the site's OS/390 or Z/OS systems programmer. Please engage the cooperation of the person or group responsible for making updates to LPA for assistance with this installation step.

SIO Appendage Module Installation Instructions

To use the EXCPVR engine an additional installation step is required. This step places the Tape/Copy EXCP Start I/O (SIO) appendage into LPA and makes it available to Tape/Copy. An appendage is a module that provides additional control over I/O operations.

There are 3 steps to setting up the SIO appendage:

1. Choose a name for the appendage.
2. Copy the OTUT0490 module from the Tape/Copy LOADLIB to a library that is in the LPA concatenation, renaming the module to the chosen module name.
3. Dynamically add the appendage module to LPA, if desired (this will allow it to be available before the next IPL).

These steps are detailed on the next few pages.

Step 1 - Name the appendage module

The IBM standard for naming appendage routines is IGG019xx, where xx is anything in the range of WA to Z9. Examine the existing LPA concatenation and SYS1.SVCLIB to find a suitable appendage module name that is not already in use. Any name between IGG019WA and IGG019Z9, inclusive, that is not already in use may be used. Once you have selected a module name to use, verify that module name is available by issuing a display command. The format of the display command is:

```
D PROG,LPA,MODNAME=modname
```

If the response to the D PROG command is **CSV550I modname WAS NOT FOUND IN THE LPA**, then modname is available. If the module name is found in the LPA, then that module name is already in use and you must choose a different name.

Step 2 - Copy OTUT0490 to an LPA library and rename it

The Tape/Copy load module OTUT0490 must be copied into a load library that is in the LPA list. The LPA list is identified in member LPALSTxx of the operating system PARMLIB. There may be an existing LPA library into which the Tape/Copy SIO appendage module can be copied, or a library may have to be created and added to the LPA list. This is a site-specific procedure.

Warning Consult with the person or group responsible for making updates to LPA before updating an LPA library.

After a library to contain the SIO appendage module has been chosen, copy OTUT0490 from the Tape/Copy LOADLIB and rename it to the IGG019xx name chosen in Step 1.

Step 3 - Dynamically add the appendage module to LPA

Updates to the LPA list and to LPA datasets become effective when the system is IPL'd with the CLPA (create link pack area).

The SETPROG command can be used to dynamically add a module to LPA. The format of the SETPROG command is

```
SETPROG LPA,ADD,MODNAME=(modname),DSNAME=data.set.name
```

Where modname is the name of the module (IGG019xx) to be added to LPA, and data.set.name is the dataset name that contains the module.

Warning The effects of the SETPROG LPA,ADD command is only temporary. The next IPL will erase the effects of any previous SETPROG LPA,ADD commands. However, the next IPL with CLPA will rebuild LPA from the LPALSTxx and IEALPAxx PARMLIB members.

Standard EXCP vs. EXCPVR

This section briefly describes how EXCPVR differs from EXCP. It provides information on the benefits of EXCPVR and also the “consequences” of using it instead of EXCP.

What is EXCPVR?

The “**VR**” in EXCPVR stands for “**V**irtual addresses have already been translated to **R**eal addresses”. This means that the program itself has both locked down (page-fixed) all main storage the channel hardware will access (I/O buffers, the channel program itself and IDAWs) and has translated the addresses in all channel programs and IDAWs from virtual to real addresses. These actions are necessary because the channel hardware deals only with real storage addresses (not virtual addresses) and it fetches and stores data blindly from and into those addresses without regard for MVS paging actions (page in, page out, page steal, etc.) that can switch the use of a real storage page, giving it to another program.

Processing with Standard EXCP

When using standard EXCP, the program builds the channel program in virtual storage and then issues EXCP. On each I/O call, the MVS EXCP processor:

1. Copies the user’s channel program to another location in storage
2. Page-fixes the copied channel program storage
3. Translates the channel program addresses from virtual addresses to real addresses
4. Builds IDAWs (Indirect Data Address Words that point to the real storage addresses of buffer segments) in page-fixed storage. These are needed because the I/O buffer is in virtual storage and will be backed by noncontagious real storage pages. Each 2K buffer segment requires an IDAW.
5. Page-fixes the programmer’s I/O buffer(s)

   Because EXCP knows nothing in advance about the program’s channel program, it must translate it one CCW at a time, discovering what storage needs to be page-fixed and constantly getting more internal EXCP storage as it goes along. As soon as the I/O completes all storage is page-freed, EXCP storage is then released and the translated channel programs and IDAWs are discarded.

Note This process is very inefficient as it will need to be repeated on the very next I/O, but is unavoidable with regular EXCP.

Processing with EXCPVR

When using EXCPVR for processing, the program itself does all the necessary page-fixing of storage and translates all virtual addresses to real addresses, instead of EXCP. By far the biggest gain from this is that the program can page-fix all I/O storage once (before the very first I/O is done) then page-free that storage once (when all I/O is done).

Example

If copying a file requires 5000 read EXCPs and 5000 write EXCPs, then with EXCPVR one page-fix and one page-free can be done, instead of 10,000 of each (5000 for reads and 5000 for writes), saving 9998 page-fixes and 9998 page-frees.

Another benefit of using EXCPVR is that the program does not have to copy its channel program to other storage as EXCP must and the program can translate its own channel programs much more efficiently than EXCP can because it knows what they contain.

Note Because of the huge reduction of page-fix and page-free operations, a job using EXCPVR takes much less CPU time, is much more efficient and also reduces its elapsed time.

The downside of using EXCPVR is that it holds onto page-fixed storage continuously (except when swapped out) which reduces the amount of real storage available to other jobs during that interval. This can negatively impact other jobs running at the same time if there is a shortage of real storage. This issue can be a factor in some data centers, however most will benefit using EXCPVR because the jobs run much quicker, freeing resources like tapes and tape drives much sooner.

Impact of EXCPVR on System Resources

The impact of using EXCPVR, instead of EXCP, depends on:

- the amount of real storage in the machine/LPAR
- how many jobs are active
- what the real storage needs are for those active jobs

The following is a general warning from IBM (taken from the IBM DFSORT manual) on the use of EXCPVR. The same principles can also be applied to using EXCPVR with Tape/Copy.

Warning IBM DFSORT: warning on Using DFSORT with its EXCPVR option

The use of EXCPVR may result in increased paging rates and cause other programs to be swapped out, especially when using larger storage areas or on heavily loaded systems. This phenomenon is less likely to occur on systems with large amounts of central storage.

IBM Recommendation:

Use EXCPVR to reduce CPU time if your system has sufficient central storage and low paging activity. When too much storage is page-fixed by all of the applications (both DFSORT and other applications) that are running concurrently, system throughput can be degraded as excessive paging and swapping activity can result due to contention for the remaining unfixed pages.

Choosing Conversion Job Performance Options

Deciding which performance options to use for Tape/Copy's conversion jobs depends on a few factors such as:

- How critical the speed of the conversion job(s) is
- How much real storage is available and if there is contention for it
- Whether there are higher priority jobs using the same I/O resources

The decision on how to customize Tape/Copy performance related parameters must be made on a data center by data center basis. **There is no concrete solution or method**. However, in order to assist users in making this decision, OpenTech has provided a table of suggestions.

Resource Situation	Suggestion
If a large number of tapes need to be copied and elapsed time is important...	- EXCPVR should most likely be used
If real memory is not constrained (or will not be constrained at the time the conversion job runs)...	- EXCPVR should most likely be used (as it will allow the job to complete in the least amount of time and use the least amount of resources)
If real memory is constrained...	- do not use EXCPVR; use standard EXCP (EXCPVR-MODE: NO)
If conversion job performance is not very critical and/or higher priority work requires machine resources...	- use standard EXCP mode (EXCPVR-MODE: NO)
To get the *absolute fastest* Tape/Copy conversion performance possible*****... *** Be sure to read all warnings in this chapter thoroughly!**	- run the conversion job in a high-priority performance group - use EXCPVR in non-swappable mode (using the parameters as listed below): EXCPVR-MODE: YES EXCPVR-NONSWAPPABLE: YES

“Tuning” Conversion Job Performance

Tape/Copy uses proprietary tuning algorithms to optimize data transfer on a per-dataset basis during a conversion. These algorithms generally allow Tape/Copy to achieve the best combination of read/write device efficiency while also minimizing elapsed job times. Except in unusual cases, the user will not need to change any parameters or do any manual tuning in order to get optimum performance.

Though the product is self-tuning, Tape/Copy does provide a means to adjust some of the values through user parameters and provides detailed performance data (the EXCP Analysis and Performance Report discussed later in this chapter) for the user to review when trying to determine how to set the performance tuning related values. This performance data can also be helpful when reporting any suspected performance problems during conversion to Technical Support.

To allow Tape/Copy to achieve the best performance set **EXCPVR-MODE** to YES (after proper installation steps are taken).

Major Factors Affecting Performance

The major factors that affect performance in a tape copy operation are:

- Total number of I/Os (EXCPs)
- Job elapsed time
- Job CPU time

Note Another useful measurement (that combines two of the above factors) is megabytes of data copied per second (MB/SEC).

I/Os (or EXCPs)

The smaller the number of I/Os used to copy a given amount of data the better. There is a fixed overhead in the operating system's IOS code to initiate a new I/O operation and to handle the resulting I/O interrupt.

The fewer the I/Os issued; the smaller the total CPU overhead.

The number of I/Os required to read a dataset is generally the total number of blocks in the dataset divided by the number of blocks that can be read in one I/O operation (i.e. in one channel program). If there were 30,000 blocks in an input tape dataset and each I/O operation read 30 of them, it would take 1,000 I/Os (or 1,000 EXCPs) to read the file. The same is true with writes.

The Tape/Copy conversion engine will attempt to read/write as many blocks at a time as will fit in its I/O buffer up to an amount that would negatively effect read/write overlapping, as the goal is to achieve the minimum elapsed time.

The larger the buffer; the more blocks processed in one I/O and the fewer total I/Os.

The EXCP Analysis and Performance Report contains the total amount of read and write I/Os issued during the dataset copy, and also the maximum number of blocks per I/O that was used.

Warning RECFM=U: Due to the way S/390 channel programs are designed, even when a channel program attempts to read multiple blocks by chaining Read commands together (as Tape/Copy's EXCP engine does), it can sometimes end up reading just one block, or a few blocks, at a time. This is because the channel program is terminated the first time the number of bytes a Read command is prepared to read (usually set to the maximum block size of the dataset) does not exactly match the size of a the actual block read. This is usually the case with RECFM=U blocks. RECFM=FB datasets are not affected by this limitation and Tape/Copy uses special channel programming, combined with BDW use, to get around it for RECFM=V/VB datasets.

Job Elapsed Time

The elapsed time of the job is an important factor that measures how long it takes to copy a set of datasets. It also determines how long the input and output tape drives will remain allocated to the job, which can also be an important consideration if tape drives are minimal or highly utilized.

Warning Long mount times (waits for tape mounts) will affect elapsed time.

CPU Time

CPU time is a component of elapsed time, but more importantly it indicates how much of the CPU resource a job took. The more CPU time a job takes the less CPU is available for other jobs in the system. Tape/Copy has been designed to minimize the amount of CPU time taken during the physical copy portion of the conversion.

The portion of the CPU time used during the physical copy portion of the copy operation is measured and appears on the EXCP Analysis and Performance Report. This can be of some value when comparing runs with different parameter settings, even though it does not capture all of the CPU processing. It cannot be used to compare EXCP with EXCPVR as much of the work needed by EXCP, but avoided by EXCPVR, is not captured. However, the CPU time required for the entire job is not measured, but is available in the job log and other sources. CPU time for the entire job includes the non-copy portion of a conversion caused by tape management system overhead, catalog overhead, etc. which is somewhat outside of Tape/Copy control.

MB/SEC

MB/SEC is a calculated figure that has two purposes. First it is a measure that can be used for tuning purposes, and second it can be used to estimate and project how long it will take to copy large amounts of tapes (how long tape migrations will take). The EXCP Analysis and Performance Report has two different MB/SEC numbers.

- **Physical Copy MB/SEC** gives the rate at which data was copied during the physical copy portion of the conversion. This rate does not include conversion job time before and after the copy portion of the conversion. This rate is directly affected by the conversion job performance parameters previously described.
- **Total Job MB/SEC** gives the rate at which data was copied over the entire elapsed time of the job (including the non-copy-operation portions of the job). This rate can be used to help project the amount of time it will take to copy large amounts of tapes.

There are three important things to remember about both MB/SEC rates:

1. **Time waiting for tape mounts is included, so large mount time delays can cause a very low rate. The Open/Mount Information Report provides the amount of time each Open and Mount took and can be used to see the impact of tape mounts on conversion job performance.**
2. **Very small datasets can produce skewed, less meaningful numbers.**
3. **MB/SEC numbers are for the amount of data copied. So, 10MB read and then written would show up as 10 MB copied, even though it actually required reading 10 MB and then writing 10 MB.**

The following factors can greatly reduce the rate of which data can be copied:

- **Small block sizes** - It can take 40% longer to copy the same amount of data blocked at 10,000 bytes as compared to 30,000 bytes. It can take about 95% longer to copy data blocked at 1000 bytes as compared to 30,000 bytes. The reason for this is channel/device communication protocol. There are block begin and block end communication sequences, and even when data transfer begins for a new block it takes a while (due to cable distance) for it to get to the other side, causing the maximum transfer rate not to be achieved immediately. As a result, with smaller blocks there is both block begin and block end delay, and also more transfer time when the maximum transfer rate is not in effect., causing greatly elongated elapsed times. Software cannot make the

transfer faster, though having new datasets use larger block sizes (including the new MVS Large Block Interface tape blocksizes of 64K – 256K), and re-blocking existing datasets can help significantly.

- **Record format RECFM=U** - Due to the way S/390 channel programs are designed, even when a channel program attempts to read multiple blocks by chaining Read commands together (as Tape/Copy's EXCP engine does), it will end up reading just one block at a time. This is because the channel program is terminated the first time the number of bytes a Read command is prepared to read (usually set to the maximum block size of the dataset) does not exactly match the size of a the actual block read. This is usually the case with RECFM=U blocks. RECFM=VB/FB datasets are not affected by this limitation.

Job Performance Reports

EXCP Analysis and Performance Reports

The EXCP Analysis and Performance Report consists of two reports; a detail report and a job-end summary report.

The detail report consists of data reported from the output file's perspective; that is, each detail line is reported by output dataset name and first output tape volume. The detail consists of two lines. The first line is performance information and the second line is the corresponding output dataset name. The detail report is 256 bytes wide; the most significant information is reported in the first 133 columns, and less important information to the right of column 133. To view additional data, SPF must be scrolled to the right.

The EXCP Analysis and Performance Detail Report:

- Gives a quick view of a number of key helpful factors whenever a conversion job is run
- Provides performance data that can be used in tuning and to help decide how to set the conversion performance parameters
- Can be used to help project how long it will take to copy large amounts of tapes, or do tape migrations

Example: First 133 columns

```
REL v.r.m  PTF xx                                   T A P E / C O P Y                                                OTTC0003 JOBnnnnn
DATE:  MM/DD/YYYY   TIME:  HH:MM:SS      EXCP ANALYSIS AND PERFORMANCE DETAIL REPORT FOR OTS_LPAR6_QA_TESTING            PAGE      1
                                                                  MAX     MIN
                                                                 READ    READ
   1ST                            BLOCKS                        BLOCK   BLOCK          COPY         COPY   IN  OUT        READ       WRITE
VOLSER   SEQ  MB/SEC RECFM      COPIED      BYTES COPIED  LENGTH  LENGTH ELAPSED TIME     CPU TIME VOLS VOLS       EXCPS       EXCPS
+----+ +---+ +-----+ +---+ +---------+ +---------------+ +-----+ +-----+ +----------+ +----------+ +--+ +--+ +---------+ +--------+
VVVVVV     2 999.999   U   999,999,999 9,999,999,999,999 9999999 9999999 HH:MM:SS.001 HH:MM:SS.001  999  999 999,999,999 999,999,999
DSNAME: OUTPUT.DATASET.NAME.ONE

VVVVVV     3 999.999   U   999,999,999 9,999,999,999,999 9999999 9999999 HH:MM:SS.001 HH:MM:SS.001  999  999 999,999,999 999,999,999
DSNAME: OUTPUT.DATASET.NAME.TWO

VVVVVV     3 999.999   U   999,999,999 9,999,999,999,999   99999   99999 HH:MM:SS.001 HH:MM:SS.001  999  999 999,999,999 999,999,999
DSNAME: OUTPUT.DATASET.NAME.THREE
```

Example: Next 123 columns

```
                            MAX      MIN
                           WRITE   WRITE
     DUPLEX      BLOCKS   BLOCK   BLOCK -----COMPRESSION----- -----ENCRYPTION------ ------ENCRYPTION BYTES COPIED------
      EXCPS     WRITTEN  LENGTH  LENGTH         TIME     RATE         TIME     RATE              READ             WRITE
+---------+ +---------+ +-----+ +-----+ +----------+ +------+ +----------+ +------+ +---------------+ +---------------+
999,999,999 999,999,999 9999999 9999999 HH:MM:SS.001 9999.999 HH:MM:SS.001 9999.999 9,999,999,999,999 9,999,999,999,999

999,999,999 999,999,999 9999999 9999999 HH:MM:SS.001 9999.999 HH:MM:SS.001 9999.999 9,999,999,999,999 9,999,999,999,999

999,999,999 999,999,999 9999999 9999999 HH:MM:SS.001 9999.999 HH:MM:SS.001 9999.999 9,999,999,999,999 9,999,999,999,999
```

Field	Description
DSNAME	Contains the output dataset name. If renaming was performed using newname/Dual Copy functions, this dataset name will be different from the input dataset name.
1ST VOLSER	Contains the volume serial number for the first tape upon which the output dataset resides.
RECFM	Contains the file's record format represented by a single character F, V, or U.
SEQ	Contains the output file sequence number.
MB/SEC	Contains the number of megabytes per second copied during the copy operation portion of the conversion. This value is calculated by the number of megabytes copied divided by the elapsed time. The elapsed time is specifically for the copy operation; it does not include Open, Close, or other conversion job overhead (i.e.; the mount time for the original input and output volumes is included in this rate, but the mount time for additional volumes is not included).
BLOCKS COPIED	Contains the number of blocks copied in the copy operation.
BYTES COPIED	Contains the number of bytes copied by the copy operation.
MAX READ BLOCK LENGTH	The size of the largest block read during the copy operation.
MIN READ BLOCK LENGTH	The size of the smallest block read during the copy operation.
COPY ELAPSED TIME	The amount of time measured from the beginning of the physical copy operation through the last write to the output dataset. Events such as Open and Close, Catalog and Tape Management System interfacing are not included since they happen before the first and after the last write have completed.
COPY CPU TIME	The amount of CPU time for the dataset to be copied.
IN VOLS	Contains the number of input volumes mounted during the dataset copy process.

Field	Description
OUT VOLS	Contains the number of output volumes mounted during the dataset copy process.
READ EXCPS	Contains the number of channel programs started in order to read the input tape. (This number can be much higher than the number of Write EXCPs if the RECFM=U.)
WRITE EXCPS	Contains the number of channel programs started in order to write the output tape.
DUPLEX EXCPS	Contains the number of channel programs started in order to write to the duplex output tape. This field will be zero if the job is not creating duplex output tapes.
BLOCKS WRITTEN	Contains the number of blocks read and written during the copy operation.
MAX WRITE BLOCK LENGTH	The size of the largest block written during the copy operation. This report field is reported only if the output file is reblocked (and is otherwise blank).
MIN WRITE BLOCK LENGTH	The size of the smallest block written during the copy operation. This report field is reported only if the output file is reblocked (and is otherwise blank).
COMPRESSION TIME	The amount of time spent compressing or expanding data related to encryption processing. This field is displayed only when encryption processing with compression is used.
COMPRESSION RATE	The rate, in megabytes per second, that data is compressed (or expanded). This field, like compression time, is displayed only when encryption processing with compression is used.
ENCRYPTION TIME	The amount of time spent encrypting or decrypting data. This field is only displayed when using encryption processing.
ENCRYPTION RATE	The rate, in megabytes per seconds, that data is encrypted (or decrypted). This field, like encryption time, is displayed only when encryption processing is used.
ENCRYPTION BYTES COPIED READ	The number of bytes encrypted/decrypted during an encryption operation.
ENCRYPTION BYTES COPIED WRITE	Contains the number of bytes encrypted/decrypted during an encryption operation.

EXCP ANALYSIS JOB-END SUMMARY

```
EXCP ANALYSIS AND PERFORMANCE JOB END SUMMARY

       NUMBER OF BYTES COPIED:            9,999,999,999,999
  TIME SPENT COMPRESSING DATA: 00 HOURS 00 MINS 99.999 SECS
    TIME SPENT EXPANDING DATA: 00 HOURS 00 MINS 99.999 SECS
   TIME SPENT ENCRYPTING DATA: 00 HOURS 00 MINS 99.999 SECS
   TIME SPENT DECRYPTING DATA: 00 HOURS 00 MINS 99.999 SECS
   PHYSICAL COPY ELAPSED TIME: 00 HOURS 00 MINS 99.999 SECS
       PHYSICAL COPY CPU TIME: 00 HOURS 00 MINS 99.999 SECS
       TOTAL JOB ELAPSED TIME: 00 HOURS 00 MINS 99.999 SECS
             TOTAL JOB MB/SEC:              9999.999 MB/SEC
 EXCLUDE MOUNT: TOTJOB MB/SEC:              9999.999 MB/SEC
```

Field	Description
ENCRYPTION RATE	The rate, in megabytes per seconds, that data is encrypted (or decrypted). This field, like encryption time, is displayed only when encryption processing is used.
NUMBER OF BYTES COPIED	Contains the total number of bytes copied by this conversion job.
TIME SPENT COMPRESSING DATA	Contains the total amount of time spent compressing data prior to encryption. This line is normally missing from the summary report, but is displayed when compression is used with encryption processing.
TIME SPENT EXPANDING DATA	Contains the total amount of time spent expanding data after decryption. This line is normally missing from the summary report, but is displayed when the input file was compressed with encryption processing.
TIME SPENT ENCRYPTING DATA	Contains the total amount of time spent encrypting data for the given conversion job. This line is normally missing from the summary report, but is displayed when encryption processing is used.
TIME SPENT DECRYPTING DATA	Contains the total amount of time spent decrypting data for the given conversion job. This summary line is normally missing from the summary report, but is displayed when decryption processing is used.
PHYSICAL COPY ELAPSED TIME	Contains the accumulated COPY ELAPSED TIME from reported in each detail line entry (individual copy operation). Thus, this value is the sum of all elapsed times from the beginning from each physical copy operation through the completion of the last write to each output dataset. Events such as Open and Close, Catalog and Tape Management System interfacing are not included in this value since they happen before the first and after the last write for each copy.
PHYSICAL COPY CPU TIME	Contains the accumulated amount of CPU time for each dataset copy operation.
TOTAL JOB ELAPSED TIME	Contains the total amount of time measured from the beginning of the physical copy operation to the completion of the last write to the output dataset.

Field	Description
TOTAL JOB MB/SEC	Contains the total number of megabytes copied per second during the entire job, including overhead. The number is computed using the number of megabytes copied divided by the job's elapsed time. The value is skewed in cases where one or a few small tape files are copied because the value includes non-copy overhead; e.g., tape management product activity and intervening tape mounts. This number is probably the most realistic number to use for planning how long it will take to copy a large collection of tape files.
EXCLUDE MOUNT:TOTJOB MB/SEC	This line prints when processing multivolume datasets. The value is similar to TOTAL JOB MB/SEC; except the time waiting for intervening tape mounts (i.e., the time waiting between EOV and accessing the next volume) is removed from the MB/sec calculation. This value gives a more accurate value of tape copy work; likewise, the difference between this value and TOTAL JOB MB/SEC shows how the mount times effect the job runtime.

14 Conversion Job Triggering

TOPICS COVERED IN THIS CHAPTER

Using Conversion Job Triggering (page 14-3)

Conversion Job Trigger Reporting Function (page 14-5)

Introduction

The Conversion Job Triggering function provides a means for Tape/Copy to take a predetermined action when all jobs related to the current conversion job set have been completed. This allows users to automate Tape/Copy operations within their environment.

Based on the parameters set by the user, Tape/Copy can:

- Issue a WTO message, **or**
- Submit a job, **or**
- Create a dataset

upon successful completion of all jobs in a conversion job set.

Note A conversion job set is defined as all conversion jobs created by a single candidate selection job.

This function may also make scheduling Tape/Copy processing through a data center's job scheduling package much easier, or assist in auto-scheduling a process after the job set has successfully completed.

Process Overview

Conversion Job Triggering utilizes a control dataset. During the Candidate Selection process a control member is dynamically created in the control dataset to keep track of the status of the conversion jobs in a conversion job set, and a token set is then dynamically assigned to each conversion job to identify which member within the control dataset is to be updated to reflect the processing status of that conversion job. When Tape/Copy detects that the current conversion job is the last in the conversion job set, the action requested by the user is performed and a status report is generated.

Using Conversion Job Triggering

Several options are available to fully customize the Conversion Job Triggering process. (The full parameter descriptions are found in the Tape/Copy "Parameter Reference Guide".) The Conversion Job Triggering parameters and their desired values can be added to the USERSETS member of the Tape/Copy PARMLIB library in order to override their default values.

In order to tell Tape/Copy that you wish to use Conversion Job Triggering, the CNV-JOB-TRIGR-FUNCTIONS parameter should be set to YES.

Identify a Partitioned Datasets Extended (PDSE) dataset that has an LRECL of 80 and a RECFM of FB or F to be used as the conversion job triggering control dataset (the repository for the conversion job set status). This dataset can be specified using the CNV-JOB-TRIGR-CTRL-DSN. (If the dataset specified by this parameter does not already exist, Tape/Copy will create it with the appropriate specifications).

Note If no dataset is specified (i.e. - the CNV-JOB-TRIGR-CTRL-DSN parameter is set to NONE), Tape/Copy will create a PDSE named using the value specified for the DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX parameter and using the suffix TCCONV.CONTROL).

Warning The Conversion Job Triggering functions will not work using a standard PDS for the control dataset! The control dataset MUST be a PDSE to allow the control dataset to expand dynamically.

During the Candidate Selection process Tape/Copy will create control members (named CJ000001, CJ000002, etc.) within the control PDSE dataset which will contain "tokens" for tracking the status of the conversion jobs.

The Conversion Job Triggering Control Member (CNV-JOB-TRIGR-CONTROL-MEMBER) and the Token Set (CNV-JOB-TRIGR-TOKEN-SET) parameters are given values by the Candidate Selection process. **These parameters must not be manually modified by the user.**

Using the CNV-JOB-TRIGR-MAXIMUM-MEMBER-COUNT and the CNV-JOB-TRIGR-MEMBER-WRAP parameters, the user can control how many members can exist in the control dataset (default value=1000) and define a coarse of action to be taken when that limit has been reached. Setting the CNV-JOB-TRIGR-MEMBER-WRAP parameter to NO (default value) will cause Tape/Copy to abend when the maximum number of control members in the control dataset has been reached. Setting CNV-JOB-TRIGR-MEMBER-WRAP to YES will allow Tape/Copy to overlay members starting with the first duplicate member name it encounters.

Note If the CNV-JOB-TRIGR-MEMBER-WRAP parameter is set to YES, any historical information contained in the conversion job triggering PDSE control dataset will be destroyed when the member wrapping occurs.

The CNV-JOB-TRIGR-ACTIONS parameter is used to specify what action Tape/Copy should take once the conversion jobs in the conversion job set have completed. The following options are available:

- **ISSUEWTO** - Issues a WTO message to the MVS console.
- **SUBMITJOB** - Submits a job from a user-defined dataset/member into the MVS Internal Reader.
- **CREATEDSN** - Creates a dataset (using a dataset name supplied by the user).

These options and their uses are explained further in this chapter.

ISSUEWTO Option

When using Conversion Job Triggering with the CNV-JOB-TRIGR-ACTIONS parameter set to ISSUEWTO, Tape/Copy will issue a WTO message to the MVS console.

The text of the WTO message is user-defined in the dataset specified by the CNV-JOB-TRIGR-WTO-DSN parameter. If the dataset specified by the CNV-JOB-TRIGR-WTO-DSN parameter is a PDS, the member name must also be specified using the CNV-JOB-TRIGR-WTO-MEMBER parameter.

The WTO message that the user provides must adhere to the following statement coding rules to be considered valid:

- WTO text can be defined using a minimum of 1 and a maximum of 2 records.
- All records must begin in column 1 with the 'LEN=nn,' parameter. The LEN parameter value (nn) is the number of characters, starting in column 8, that contain the actual WTO text.
- WTO text can be no more than a maximum of 125 characters long total.
- Each record can contain no more than 73 characters of WTO text. Therefore, if the WTO text in one record is 73 characters long (LEN=73,), the WTO text of second record cannot be more than 52 characters in length (LEN=52,).
- Anything in the record listed to the right of the area defined by the LEN parameter as the WTO text area will be considered comments.

Example WTO message text member (in BROWSE mode with COLUMNS on):

```
 ------------------------------------------------------------------------------
 BROWSE    OT.WTO.MESSAGE(WTOTEXT) - 01.01            Line 00000000 Col 001 080
 Command ===>                                                 Scroll ===> CSR
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
******************************** Top of Data *********************************
LEN=37,This is the first part of the message      COMMENTS ABOUT THE
LEN=27, this is the remaining text                WTO MESSAGE GO HERE
****************************** Bottom of Data ********************************
```

The resulting WTO issued will be:

```
   This is the first part of the message this is the remaining text
```

SUBMITJOB Option

When using Conversion Job Triggering with the CNV-JOB-TRIGR-ACTIONS parameter set to SUBMITJOB, Tape/Copy submits a user-selected job into the MVS Internal Reader.

The CNV-JOB-TRIGR-SUBMIT-DSN parameter is used to tell Tape/Copy which dataset contains the job it should submit upon completion of the conversion job set. If the dataset specified by the CNV-JOB-TRIGR-SUBMIT-DSN parameter is a PDS, the member name that contains the job to submit must also be specified using the CNV-JOB-TRIGR-SUBMIT-MEMBER parameter.

CREATEDSN Option

When using Conversion Job Triggering with the CNV-JOB-TRIGR-ACTIONS parameter set to CREATEDSN, Tape/Copy creates a dataset using the dataset name provided by the user.

The CNV-JOB-TRIGR-CREATE-DSN parameter is used to tell Tape/Copy what to name the dataset it is to create once all of the jobs in the conversion job set have completed.

The dataset created will be a fixed block, cataloged sequential file allocated with 1 track of DASD space. The DASD unit and volser used are based on the setting of the DYNAMIC-ALLOCATION-UNIT and DYNAMIC-ALLOCATION-VOLSER parameters in the USERSETS member.

Conversion Job Trigger Reporting Function

The Conversion Job Triggering function provides the ability to print the status of one or more control members within the Conversion Job Triggering control dataset. When the CNV-JOB-TRIGR-FUNCTIONS parameter is set to YES, the Conversion Job Trigger Member Activity Report is created during the Candidate Selection process. The reporting functions are determined by the value of the CNV-JOB-TRIGR-REPORT-CRITERIA parameter.

The CNV-JOB-TRIGR-REPORT-CRITERIA parameter format is as follows:

- CJnnnnnn - produce a Conversion Job Trigger Member Activity Report for the specified member of the control dataset (nnnnnn is the numeric value that the Candidate Selection job had assigned to this control member).
- CJnnnnnn-CJnnnnnn - produce Conversion Job Trigger Member Activity Reports for each control dataset member in the specified range (nnnnnn is the numeric value that the Candidate Selection job had assigned to this control member).

Warning If the CNV-JOB-TRIGR-REPORT-CRITERIA parameter is set to NONE (the default value), Conversion Job Trigger Member Reports will be created for all members in the control dataset.

Conversion Job Trigger Member Activity Report

When the CNV-JOB-TRIGR-FUNCTIONS parameter is set to YES, the Conversion Job Trigger Member Activity Report is created during the Candidate Selection process.

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y       PROGRAM OTTC0044

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION JOB TRIGGER MEMBER ACTIVITY FOR OPENTECH_SYSTEMS,_INC. PAGE      1

USING CONVERSION JOB TRIGGER CTRL DATASET: OT.TAPECOPY.TCCONV.CTRL                    ON VOLSER: WORK10

CONVERSION JOB TRIGGER MEMBER: CJ000009 HAS BEEN CREATED

JOBSET JOB NAME

 <ID>  <------>

-----------------------------------------------------------------------------------------------------------

 0001  OT110001

 0002  OT110002

 0003  OT110003

 0004  OT110004

 0005  OT110005

 0006  OT110006
```

The report example above shows that six conversion jobs were created during the Candidate Selection process.

- The Conversion Job Trigger Member id corresponds to the CNV-JOB-TRIGR-CONTROL-MEMBER.
- The CNV-JOB-TRIGR-CONTROL-MEMBER did not exist in the OT.TAPECOPY.TCCONV.CTRL dataset so it was CREATED. (Had the member already existed in the OT.TAPECOPY.TCCONV.CTRL dataset and if the CNV-JOB-TRIGR-MEMBER-WRAP parameter was set to YES, the status of the CONVERSION JOB TRIGGER MEMBER would have been REPLACED - rather than CREATED - on this report.)
- The JOBSET ID’S correspond to the CNV-JOB-TRIGR-TOKEN-SET parameter.

Conversion Job Trigger Member Status Report

The Conversion Job Trigger Member Status Report is produced as a result of the completion of the final job in a conversion job set OR by running the stand-alone JCL in the CNVJBTGR member of the Tape/Copy JCLLIB.

Examples of reports generated by both methods are provided later in this chapter.

The Conversion Job Trigger Member Status Report consists of the following:

- The Conversion Job Trigger Member id corresponds to the CNV-JOB-TRIGR-CONTROL-MEMBER.
- The Conversion Job Trigger Member (or range of members) being reported on is listed.
- The JOBSET ID'S correspond to the CNV-JOB-TRIGR-TOKEN-SET parameter.
- The COMP CODE provides the completion code for jobs that have completed.
- The STATUS field reports the completion status of the conversion job. The following are the possible values listed in the STATUS field:
- COMPLETE - completed successfully
- HALTED,I - was halted with a HALT,I (halt immediately) command using the Tape/Copy Console Communications feature and has ended
- HALTED - was halted with a HALT command using the Tape/Copy Console Communications feature and has ended
- FAILED - ended with a failure
- NOT-RUN - has not yet run
- The UPDATE TIME--DATE that the control dataset was updated with the reported status.
- The reports lists (at the bottom) what action was taken after the completion of the conversion job set (based on the value given to the CNV-JOB-TRIGR-ACTIONS parameter) and any information pertinent to that action.

Report Generated Upon Conversion Job Set Completion

During the completion process of each conversion job, the JOBSET ID for that job is updated within the Conversion Job Trigger Member. If Tape/Copy detects that the current conversion job is the last in the conversion job set, the action requested by the CNV-JOB-TRIGR-ACTIONS parameter is performed and a Conversion Job Trigger Member Status Report is generated.

Example

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y          PROGRAM OTTC0044


DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION JOB TRIGGER MEMBER STATUS FOR OPENTECH_SYSTEMS,_INC.    PAGE      1

USING CONVERSION JOB TRIGGER CTRL DATASET: OT.TAPECOPY.TCCONV.CTRL                                ON VOLSER: WORK07

CONVERSION JOB TRIGGER MEMBER: CJ000007 HAS BEEN UPDATED

JOBSET JOB NAME COMP  STATUS  UPDATE TIME—DATE
 <ID>  <------> CODE <------> <--------------->
-------------------------------------------------------------------------------------------------------------------------

 0001  UA110329 0000 COMPLETE 08.22.49 2002.020
 0002  UA110329 0000 COMPLETE 08.22.58 2002.020
 0003  OT110329 0000 COMPLETE 08.37.26 2002.020

*ACTION TAKEN:ISSUEWTO  AT:08.37.26 ON:2002.051
*DSN:OT11.ASM.CNTL                            MEM:X
*TEXT 001 - 063: TEST OTUT0329 IS COMPLETE,AND THIS THE TEST WTO MSG

*TEXT 064 - 126:
```

The report example above indicates that all jobs in the conversion job set completed successfully and a WTO was issued to the MVS console.

Report Generated Using the CNVJBTGR JCL

The JCL in the CNVJBTGR member of the Tape/Copy JCLLIB can be used to run a “stand-alone” job that produces a Conversion Job Trigger Status Report. In the PGMSETS DD of the JCL, the CNV-JOB-TRIGR-FUNCTIONS parameter should be set to YES and the CNV-JOB-TRIGR-REPORT-CRITERIA can be set to either a specific member or a range of members that you wish to report on within the control dataset. To list all members in the control dataset, specify a range of members on the CNV-JOB-TRIGR-REPORT-CRITERA: CJ000001-CJ522236.

Each member will be reported on a new page of the Conversion Job Trigger Member Status Report.

Example

```
RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y       PROGRAM OTTC0044


DATE:  xx/xx/xxxx  TIME:  xx:xx:xx   CONVERSION JOB TRIGGER MEMBER STATUS FOR OPENTECH_SYSTEMS,_INC.   PAGE      1

USING CONVERSION JOB TRIGGER CTRL DATASET: OT.TAPECOPY.TCCONV.CTRL                      ON VOLSER: WORK07

CONVERSION JOB TRIGGER MEMBER: CJ000006 HAS BEEN REPORTED ON

JOBSET JOB NAME COMP  STATUS  UPDATE TIME—DATE
 <ID>  <------> CODE <------> <---------------->
-------------------------------------------------------------------------------------------------------------

 0001  JOB00001 —— NOT-RUN
 0002  JOB00002 —— NOT-RUN


RELEASE x.x.x   PTF LEVEL x                                T A P E / C O P Y       PROGRAM OTTC0044


DATE:  xx/xx/xxxx   TIME:xx:xx:xx    CONVERSION JOB TRIGGER MEMBER STATUS FOR OPENTECH_SYSTEMS,_INC    PAGE      2

USING CONVERSION JOB TRIGGER CTRL DATASET: OT.TAPECOPY.TCCONV.CTRL                      ON VOLSER: WORK07

CONVERSION JOB TRIGGER MEMBER: CJ000007 HAS BEEN REPORTED ON

JOBSET JOB NAME COMP  STATUS  UPDATE TIME—DATE
 <ID>  <------> CODE <------> <---------------->
-------------------------------------------------------------------------------------------------------------

 0001  UA110329 0000 COMPLETE 08.22.49 2002.020
 0002  UA110329 0000 COMPLETE 08.22.58 2002.020
 0003  OT110329 0000 COMPLETE 08.37.26 2002.020

*ACTION TAKEN:ISSUEWTO  AT:08.37.26 ON:2002.051
*DSN:OT11.ASM.CNTL                              MEM:X
*TEXT 001 - 063: TEST OTUT0329 IS COMPLETE,AND THIS THE TEST WTO MSG
*TEXT 064 - 126:
```

The report example above was generated by setting the CNV-JOB-TRIGR-FUNCTIONS parameter YES and the CNV-JOB-TRIGR-REPORT-CRITERIA parameter to CJ000006-CJ000007 in the PGMSETS DD of the CNVJBTGR JCL.

15 Console Command Interface

TOPICS COVERED IN THIS CHAPTER

Supported Console Commands (page 15-2)

Introduction

In order to provide means of communicating with Tape/Copy conversion jobs, Tape/Copy offers an MVS console command interface.

The Tape/Copy console command interface allows users to interrupt the conversion process during copy operations, or terminate a copy conversion program without causing a S222 abend. This allows the termination to complete more “cleanly” and allows Tape/Copy’s ESTAE routine to remain in control as needed.

Warning The Console Command Interface should be used in lieu of issuing an operator cancel to end a conversion job whenever possible. However, there are situations (such as when a conversion job is waiting for a reply to a WTOR issued by the system) where the Tape/Copy console commands may not be able to halt the job. In those cases where canceling the job is the only option, please make sure you verify that the input tape catalog entries and such have been recovered. See parameter description for CNV-JOB-RESET-AFTER-OPERATOR-CANCEL for more information about attempting recovering after operator cancel is issued.

Supported Console Commands

The Tape/Copy console command interface works with the use of the MVS MODIFY command (F jobname, command - where jobname is the name of the conversion job). A WTO message is issued when the Tape/Copy conversion job is eligible to accept operator commands.

The following commands are supported:

- F jobname,STATUS
- F jobname,HALT
- F jobname,HALT,I

STATUS Command

```
F jobname,STATUS
```

The STATUS command allows the user to request the status of the Tape/Copy conversion job. It will list the total number of copy operations the job is scheduled to perform and which of those copies the job is currently performing.

The results of the STATUS command request will be issued as a WTO message in the MVS log, and in the Tape/Copy conversion job log.

HALT Command

```
F jobname,HALT
```

The HALT command allows the user to request that the conversion job terminate upon completion of the current copy operation. (Tape/Copy will finish processing the current volume set before ending the job.)

The status (as in the STATUS command) is also provided when this command is issued.

HALT,I Command

```
F jobname,HALT,I
```

The HALT,I command allows the user to request that the conversion job terminate as soon as possible by interrupting the current copy operation. The dataset being processed when the HALT,I command is issued will be copied, then the conversion job will reset the tape management catalog and system catalog entry for the input tape and end the conversion. The output tape for that conversion will not be a successful copy, so the input tape would need to be processed over again to get a good copy.

The status (as in the STATUS command) is also provided when this command is issued.

16 Output File Reblocking

TOPICS COVERED IN THIS CHAPTER

Reblocking Usage Considerations/Warning (page 16-2)

Datasets Not Eligible for Conversion Reblocking (page 16-2)

Maximum New Blocksize Limits (page 16-3)

Selecting the Reblocking Option (page 16-4)

Defining Reblocking Rules (page 16-5)

Rules Processor Report (page 16-10)

Reblocking Status Report (page 16-10)

Conversion Job Reblock Report (page 16-11)

Introduction

Tape/Copy includes a reblocking option that can reblock the dataset on the output tape as part of the conversion process. Reblocking the output dataset can increase I/O performance when the output dataset is used later by production jobs. Datasets also can be reblocked to use an efficient disk blocksize (for VDR users recovering from tape to disk). The Candidate Selection process uses parameter values to allow the user to specify which datasets are to be reblocked and request either a specific new blocksize to be used on a per dataset basis, or request that the optimum blocksize be used.

Note Tape/Copy users can reblock when converting from tape to another tape, using only blocksizes larger than the input blocksize.

Note Tape/Copy VDR users can either reblock during conversion from tape to another tape, or also have the option of reblocking during Dual Copy recovery from tape to disk. In the case of datasets being restored from tape directly to disk in a recovery environment (VDR-COPYRCVY-OUTPUT: DISK), reblocking allows a dataset's blocksize to be reduced so that it is not greater than the allowable maximum blocksize on disk (generally 32760), or so that it can more efficiently use the track space (closest to but not over the optimum half-track blocksize). For tape to disk recovery blocksizes larger or smaller than the input's blocksize are permitted.

Reblocking Usage Considerations / Warning

Output Dataset Reblocking should not be used if there are applications that will use the output dataset which may not be able to process the dataset with a new blocksize. This generally only applies to applications that have the dataset's blocksize hard-coded into the programs, or if a non-IBM access method is used to read the dataset.

When using CopyCrypt for file encryption, the encryption process does its own reblocking and therefore takes precedence over the standard reblocking rules.

Datasets Not Eligible for Conversion Reblocking

If any of the following are true, the dataset will not be reblocked (the input dataset will be copied to the output dataset using the input dataset's blocksize):

- Input dataset has a BLKSIZE=0
- Input dataset has an LRECL=0
- Input dataset has a RECFM=U (or unknown RECFM)
- The requested output blocksize is greater than one of the blocksize limits in effect **(see Maximum New Blocksize Limits)**
- The requested output blocksize is less than the logical record length **(see Variable Blocked Spanned (VBS) Consideration)**
- Input dataset is not blocked (RECFM=F/V, but not FB/VB), and the user parameter ALLOW-REBLOCKING-OF-UNBLOCKED-FILES is set to NO.

Maximum New Blocksize Limits

Tape/Copy uses the following limit values when determining the reblocked output dataset blocksize. **The lowest of these values will be used as the maximum blocksize by Tape/Copy for the output dataset.**

- *When using reblocking from tape to tape*, the optimum blocksize returned from the output tape device. If duplexing is being used to copy the input dataset to 2 output tapes simultaneously (DUPLEX-MEDIA-TYPE set to a value other than NONE) the lesser optimum blocksize from either of the two tape devices is used as the limit.
- *When using reblocking from tape to disk*, during Dual Copy Recovery (VDR users only), the maximum blocksize returned from the output disk device is used as the limit.
- REBLOCK-MAX-BLKSIZE parameter value (defaults to 0 but may be overridden by the user)
- 256K
- User specified new blocksize for that dataset (if OUTPUT-FILE-REBLOCKING: OPTIMUM was not requested)

Note When using the reblocking feature to go from a larger to a smaller block size, there is a restriction that the new block size cannot be 13 or more times smaller than the original block size.

How RECFM Effects Output Dataset Blocksize

- When RECFM=F or RECFM=FB, the new blocksize will be the largest blocksize not exceeding the above limit, that is an even multiple of the LRECL
- When RECFM=V or RECFM=VB, the new blocksize will be figured using the limits stated in the **Maximum New Blocksize Limits** section.

Variable Blocked Spanned (VBS) Consideration

VBS datasets may be created with an LRECL that is larger than the BLKSIZE. This implementation of reblocking allows these datasets to be reblocked to a larger blocksize. However, it does not support reblocking these datasets to a blocksize smaller than the LRECL. Before using the reblocking feature to reblock to a larger blocksize, **the user must ensure that application using the REFCM=VBS dataset will process the larger blocksize.**

Reblocking Errors Caused by RECFM Issues

Because reblocking requires that Tape/Copy use the dataset's logical records; not just the physical blocks, the actual blocks and records Tape/Copy reads from the input tape must conform exactly to the specification for RECFM=F, FB, V, VB, VS, or VBS. If Tape/Copy encounters records or blocks that do not strictly conform to these specifications it will terminate the copy operation for that dataset and issue a WTO message indicating the error.

Tape/Copy checks for these inconsistencies and possibly others:

- RECFM=FB but blocksize not a multiple of LRECL
- RECFM=VB with invalid BDWs or RDWs

- RECFM=VBS with invalid segments or segment descriptor words

Selecting the Reblocking Option

In the Candidate Selection process, the user is given a number of ways to specify whether or not an individual dataset is to be reblocked, and if so, the desired blocksize for each individual dataset that will be copied during the conversion job. The result of that process is that each dataset to be copied during a conversion job will have one of three settings when the conversion job begins:

1. don't reblock this dataset
2. reblock this dataset using a supplied blocksize
3. reblock this dataset using the calculated optimum blocksize.

The reblocking feature is controlled by the OUTPUT-FILE-REBLOCKING parameter, which can also be set on the Tape/Copy ISPF Conversion Job Parameters panel using the “Output File Reblocking” field. This parameter is used to tell Tape/Copy whether or not it should reblock the output files resulting from a Tape/Copy conversion job and define the method(s) of reblocking.

If the OUTPUT-FILE-REBLOCKING parameter is set to NONE (default), then no reblocking takes place and all of the candidates selected by the Candidate Selection process will be copied without reblocking the output dataset. However, if OUTPUT-FILE-REBLOCKING is set to OPTIMUM, Tape/Copy will attempt to reblock the output datasets using the calculated optimum block size for the output device type. OUTPUT-FILE-REBLOCKING can also be “hard coded” to a number that represents the acceptable blocksize value for the output device type.

Since the user may wish to use a different method of reblocking or different blocksize based on the dataset that is being copied, the OUTPUT-FILE-REBLOCKING parameter also supports referral to a Tape/Copy PARMLIB member (prefixed in the parameter value by a “>” - such as OUTPUT-FILE-REBLOCKING: >RBLKRULE). When using a PARMLIB member as the OUTPUT-FILE-REBLOCKING parameter value, the user can define multiple reblocking rules in an “IF-AND-OR-THEN-DEFAULT” format to tell Tape/Copy which datasets to reblock and what reblocking method to use (NONE, OPTIMUM, or a specific number for the blocksize).

Note The RBLKRULE member of the Tape/Copy PARMLIB is provided as an example and contains comments regarding the format of the reblocking rule entries, also described in this chapter.

Reblocking Unblocked Files

The ALLOW-REBLOCKING-OF-UNBLOCKED-FILES parameter can be used if the OUTPUT-FILE-REBLOCKING is set to a value other than NONE. The ALLOW-REBLOCKING-OF-UNBLOCKED-FILES parameter can be set to YES to allow the user to tell Tape/Copy that RECFM=F and RECFM=V datasets should be reblocked as they are copied.

The ALLOW-REBLOCKING-OF-UNBLOCKED-FILES parameter is set to NO by default so that RECFM=F and RECFM=V datasets are NOT reblocked, as reblocking unblocked datasets may cause problems with some program products.

Defining Reblocking Rules

The Reblocking Rules table is used to identify the datasets for reblocking when specified by the OUTPUT-FILE-REBLOCKING parameter or on the Output File Reblocking field of the Conversion Job Parameters ISPF panel. The Reblocking Rules table uses a simple IF - AND - OR - THEN - DEFAULT logic making the rules easy to define. Each line in a Reblocking Rule table may only specify one statement.

Each Reblocking Rule consists of:

- The **rule logic modifier** (IF, AND, OR), which may be sub-modified with the BY modifier, and **command verbs** (THEN, DEFAULT)
- The tape management system field **compare code** to be compared against.
- The **comparison operator** (EQ, NE, GT, etc.).
- The **comparison data or table name**. Comparison data can be specific character strings or character pattern strings for matching fields like dataset name (DSN) and creating job name (CJOB). It can also be a numeric date, a relative date or a keyword date for matching date field such as expiration date (EXPDT) and create date (CDATE).
- The **reblock value** (used with THEN and DEFAULT command verbs). Reblock value is used to identify the reblocking to be performed on the dataset when a true condition is set for the IF, AND, OR statement set. The valid reblock values are:
  - **NONE** - The blocksize will be taken from the input file and will be used as the output file blocksize. This is the default reblocking selection.
  - **OPTIMUM** - The blocksize to be used for the file being copied to will be calculated as the optimum for the output device.
  - ***nnnnnn*** - A numeric value up to the maximum blocksize supported for the output device.

Rule Logic Modifiers Example

```
  File Edit Confirm Menu Utilities Compilers Test Help
  ------------------------------------------------------------------------------
-
  EDIT OT.TAPECOPY.PARMLIB(RBLKRULE) - 24.01 Columns 00001 00072
  Command ===> Scroll ===> CSR
  ****** ***************************** Top of Data
******************************
  000001 *      COMPARE COMPARE
  000002 *RULE   FIELD  OP    DATA
  000003 *----+ +-----+ -- +----------------------------------------+
  000004 IF     DSN     EQ OT.APPLA./
  000005 AND    CJOB    EQ >RBLKJOB
  000006 THEN   NONE
  000007 IF     DSN     NE OT.APPLA./
  000008 AND    CJOB    EQ PAY/
  000009 THEN   OPTIMUM
  000010 DEFAULT NONE
  ****** **************************** Bottom of Data
****************************
```

The rule logic modifier is used to specify how the Reblocking Rule statement is processed relative to the previous statement in the table.

IF, NEW, AND, OR Modifiers

If the rule logic modifier is **IF**, **NEW**, or not specified (blank), then the current statement becomes the first statement of a new Reblocking Rule entry.

If the rule logic modifier is **AND**, this indicates that the previous statement and the current statement are part of the same rule and both statements must be "true" for a candidate to be assigned to this Reblocking Rule entry.

If the rule logic modifier is **OR**, this indicates that the previous statement and the current statement are part of the same rule and either statement must be "true" for a candidate to be assigned to this Reblocking Rule entry.

BY Sub-Modifier

The **BY** rule logic sub-modifier can be used with any of the rule logic modifiers or by itself (which is the same as when it is specified with **IF** or **NEW**). The **BY** sub-modifier is helpful in reducing the number of statements that must be coded in the Reblocking Rules table to create separate Reblocking groups because the user can provide a list of comparison criteria in the form of a table, as in the example below.

The **BY** sub-modifier requires that the comparison data is a table name (a member within the Tape/Copy PARMLIB library) and it causes a different Reblocking group to be created for each entry in the table.

If the rule logic sub-modifier of **BY** is specified, any statements that follow the **BY** statement must begin a new Reblocking group. Specifying a rule logic modifier of **OR** or **AND** on the statement following a **BY** statement will result in a warning messages and the **OR** or **AND** statement will be ignored.

THEN, DEFAULT Verbs

If the reblocking rule created using the entries in this table is found to be “true”, the **THEN** command verb can be used to specify the name of the desired reblocking value (“NONE”, “OPTIMUM” or a numeric value up to the maximum blocksize supported for the output device) to use for datasets that match the “true” reblocking rule entry.

If a THEN command verb is not specified in association with the “true” reblocking rule, the reblocking value found in the **DEFAULT** command verb statement will be used (if any). Otherwise, no reblocking is performed for the datasets matching that reblocking rule.

Tape Management System Field Compare Code

The tape management system field compare code is used to identify which tape management system field Tape/Copy should compare with the user-defined comparison data.

Field Compare Code	Description
ACCTNUM	Account number
ATLID	Automated tape library name
BKCRYPT	VDR Backup Encryption Flag (Y/N) (VDR CopyCrypt users only; used only during VDR Recovery)
CDATE	Creation date
CDDNAME	Creating DD name
CEXPDT	Calculated expiration date
CJOB	Creating job name
CPGM	Creating program name
CSTEP	Creating job step name
DSN	Dataset name
EXPDT	Expiration date
KBSIZE	Size of the file in kilo-bytes
LDATE	Last used date
LDDNAME	Last used DD name
LJOB	Last used job name
LPGM	Last used program name
LSTEP	Last used job step name
OUTCODE	Outcode / Vault ID / Location ID
VOLSER	First volser of file

Comparison Operators

The following table provides a list of the comparison operands supported for reblocking rule processing.

Comparison Operator	Description
EQ	Equal
NE	Not equal
GT	Greater than
LT	Less than

Comparison Operator	Description
GE	Greater than or equal
LE	Less than or equal

Comparison Data

The valid formats for comparison data are character data, date values and Tape/Copy PARMLIB library members that contain character data or date values.

Character data can either be specific values or generic/pattern values (using valid OpenTech Systems wildcard standards - see Appendix A). Character data is the expected data type when comparing the following tape management system fields:

ACCTNUM	CSTEP	LSTEP
ATLID	DSN	OUTCODE
CDDNAME	LDDNAME	VOLSER
CJOB	LJOB	
CPGM	LPGM	

Date values can be either:

- **Specific dates** - provided in Julian (yyyy.ddd) or Gregorian (mm/dd/yyyy) format.
- **Relative dates** - specified by a single numeric value and are calculated as a number of days from the current date.
- **Keyword dates** - used to specify the expiration value used for candidates that use special expiration criteria. The valid keyword date values are:

PERMANENT	UNKNOWN
CYCLECNTL	DATECNTL
FOREIGN	MOVEIMMED
LDATE	USERDATE
ELAPSEDDAYS	STATSDATE
CATLGDATE	CATALOG

Note Internally, Tape/Copy stores all keyword dates as a Julian date (9900.001 or higher). Therefore, if the EXPDT field value is less than 9900.001 it is considered a specific date expiration value.

Using a Table as Comparison Data

Reblocking Rule processing will also accept the name of a Tape/Copy PARMLIB member as the comparison data. The PARMLIB member should contain a table of character data or date values (as defined on the previous page). The PARMLIB member name should be prefixed by a '>' symbol to distinguish it from standard comparison data.

For example:

```
>RBLKDATA
```

RBLKDATA would need to be a member in the Tape/Copy PARMLIB library (or the name of a ddname within the candidate selection job stream).

If used as the comparison data for an IF, AND or OR statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and any datasets that match any of the entries will be selected for that Reblocking Rule group. The entries in a member used for comparison data for IF, AND or OR should be in the form of a list. One entry per line, such as:

```
****** ***************************** Top of Data ******************************
000001 FILEA.PROD.LIST
000002 FILEB.PROD.LIST
000003 FILE*.WORK.LIST
****** **************************** Bottom of Data ****************************
```

Note Each entry in the PARMLIB member table will be part of the same Reblocking Rule (all will receive the same output blocksize).

If used as the comparison data for a BY statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and each entry in the member will generate a separate Reblocking group. The entries in a member used for comparison data for BY sub-statements should be in the form of “comparison data1 THEN value1”, such as

```
****** ***************************** Top of Data ******************************
000001 FILEA.PROD.LIST  THEN  OPTIMUM
000002 FILEB.PROD.LIST  THEN  56664
000003 FILE*.WORK.LIST  THEN  32760
****** **************************** Bottom of Data ****************************
```

Note Each entry in the PARMLIB member table will create a new Reblocking ID (each will receive the individually specified blocksizes).

Rules Processor Report

The Rules Processor Report is produced during the Candidate Selection process and written to DD RULESRPT. This report serves as a cross reference between the user-defined Reblocking Rules table and the Tape/Copy generated Rule ID's.

Note The Rules Processor Report is also generated for other “rules processing” features, such as Co-Location. A section will be printed for each rules processing function that is in effect when the Candidate Selection job runs.

Warning The Rules Processor Report will not list the statement specified by a BY rule logic sub-modifier. It will list the rules that were generated based on the BY statement and the contents of the table it specified.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                          PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     RULES PROCESSOR REPORT FOR TABLE: RBLKRULE FOR OPENTECH_SYSTEMS,_INC.          PAGE      1

 +  RULE   +          COMPARE
 +---ID----+          +FIELD+     +-----------------COMPARE DATA-----------------+

           1  IF      DSN      EQ OT.APPLA./

              THEN    OPTIMUM

           2  IF      DSN      EQ >APPLTBL
                                    OT.RELTEST./
                                 OR OT.CSTEST./

              DEFAULT NONE
```

Reblocking Status Report

If the OUTPUT-FILE-REBLOCKING parameter value is set to a Tape/Copy PARMLIB member (such as, >RBLKRULE) which contains user-defined reblocking rules, a Reblocking Status Report is produced to show each dataset and the reblocking rule that applies to it.

```
REL x.x.x  PTF x                          T A P E / C O P Y                          PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME: xx:xx:xx   REBLOCKING STATUS REPORT FOR OPENTECH_SYSTEMS        PAGE      1

+  RULE  +
+---ID---+ DATASET NAME                                  VOLSER +--------------STATUS MSG--------------+

           OT11.STACK.OT110000.D2004126.T104733          000044 RBLK OF UNBLKED DATASET: N AND RECFM: F
         2 OT.APPLA.SZ12.DATA0001.SFSV.DATASET           000044 RBLKMEM: RBLKRUL1, RBLK OPTION: 0717273
         0 OT.APPLA.SZ12.DATA0008.SFSV.GDG.G0003V00      000044 RBLKMEM: RBLKRUL1, RBLK OPTION: NONE
         0 OT.APPLA.SZ12.DATA0008.SFSV.GDG.G0001V00      000038 RBLKMEM: RBLKRUL1, RBLK OPTION: NONE
           OT.RELTEST.SZ12.FDR.SFSV.DATASET              000042 NO REBLOCK, RECFM OF DATASET: U
         4 OT.APPLA.SZ12.DATA0003.SFMV.DATASET           000003 RBLKMEM: RBLKRUL1, RBLK OPTION: 0008888
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE01            000027 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE02            000027 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE03            000027 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE04            000028 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
         6 OT.APPLA.SZ12.DATA0005.MFMV.FILE05            000028 RBLKMEM: RBLKRUL1, RBLK OPTION: 0123456
```

Note If a dataset matched a reblocking rule but was selected for encryption by CopyCrypt, it is no longer eligible for reblocking (since the data is already reblock by the encryption process). If this occurs, the dataset will be listed on the Reblocking Status Report with a status of “NO REBLOCK WITH ENCRYPTION, USING: NONE”. See the CopyCrypt User Guide for more information on CopyCrypt.

Conversion Job Reblock Report

The Conversion Job Reblock Report is produced by the Tape/Copy conversion job when the OUTPUT-FILE-REBLOCKING parameter is set to a value other than NONE. This report shows the blocksize values and limits that were in effect at the time the conversion job's reblocking functions are performed. It will also list a reason code for datasets that have not been reblocked during conversion.

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION JOB REBLOCK REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE      1


   BLKSIZE VALUES AND LIMITS USED IN DETERMINING THE MAXIMUM BLKSIZE ALLOWED

 ALLOW-REBLOCKING-OF-UNBLOCKED-FILES:       NO
       REBLOCK-MAX-BLKSIZE USER PARM:    44500
      DISKOUT DEVICE OPTIMUM BLKSIZE:    27998   MAXIMUM BLKSIZE:    32760
  ------> CONVERSION JOB MAX BLKSIZE:    27998


 ************************************************************************************************************************
 *  RCDE (REASON CODE): WHETHER DATASET WAS REBLOCKED OR IF NOT, WHY NOT
 *   Y - THE DATASET WAS REBLOCKED AS REQUESTED
 *   1 - DATASET NOT REBLOCKED, PER USER SELECTION CRITERIA
 *   2 - DATASET NOT REBLOCKED, INPUT BLKSIZE = 0
 *   3 - DATASET NOT REBLOCKED, RECFM=U
 *   4 - DATASET NOT REBLOCKED, LRECL=0
 *   5 - DATASET NOT REBLOCKED, INPUT BLKSIZE >= REBLK MAX BLKSIZE
 *   6 - DATASET NOT REBLOCKED, INPUT BLKSIZE > USER VALUE
 *   7 - DATASET NOT REBLOCKED, NEW BLKSIZE = OLD (REFCM=F)
 *   8 - DATASET NOT REBLOCKED, RECFM IS UNKNOWN
 *   9 - DATASET NOT REBLOCKED, NEW BLKSIZE < LRECL
 *   A - DATASET NOT REBLOCKED, INPUT NOT BLOCKED, ALLOW-REBLOCKING WAS SET TO NO
 ************************************************************************************************************************


 INPUT DATASET NAME (TAPE) ----------------+   BLKSZE RECFM RCDE  CANDSEL OUTPUT DATASET NAME (DISK) ----------------+  BLKSZE RECFM

 OT.VDRLA.V000026.F0001.A0004.MFSV.FILE01        32000   FB    Y     22000 OT.APPLA.SZ12.DATA0004.MFSV.FILE01             22000   FB
 OT.VDRLA.V000026.F0002.A0004.MFSV.FILE02        32000   FB    Y   6018000 OT.APPLA.SZ12.DATA0004.MFSV.FILE02             27000   FB
 OT.VDRLA.V000026.F0003.A0004.MFSV.FILE03        32000   FB    Y   OPTIMUM OT.APPLA.SZ12.DATA0004.MFSV.FILE03             27000   FB
 OT.VDRLA.V000026.F0004.A0004.MFSV.FILE04        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE04             32000   FB
 OT.VDRLA.V000026.F0005.A0004.MFSV.FILE05        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE05             32000   FB
 OT.VDRLA.V000026.F0006.A0004.MFSV.FILE06        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE06             32000   FB
 OT.VDRLA.V000026.F0007.A0004.MFSV.FILE07        32000   FB    1      NONE OT.APPLA.SZ12.DATA0004.MFSV.FILE07             32000   FB


 JOB END SUMMARY FOR DATASETS REBLOCKED


                  DATASETS REBLOCKED:        3

   AVERAGE BLKSIZE BEFORE REBLOCKING:    32000

    AVERAGE BLKSIZE AFTER REBLOCKING:    25333
```

17 Handling Bad Blocks

Topics Covered In This Chapter

When Tape/Copy Skips Bad Blocks (page 17-2)
Skipped Block Report (page 17-3)

Introduction

Occasionally, Tape/Copy may encounter datasets that have unreadable blocks of data. A block is considered unreadable after any and all error recovery actions (performed by either the tape drive itself and/or MVS Error Recovery Procedures (ERPs)) have completed and the block is still bad, with sense data indicating it has received a Data Check. The recovery actions may include internal tape drive procedures, read retries and a system initiated swap to another drive.

By default Tape/Copy will terminate the copy operation when bad blocks are encountered. However, since some users may wish to process the datasets with bad blocks anyway so that some of the data on the tape can be used, Tape/Copy offers a user parameter called EXCP-SKIP-UNREADABLE-BLOCKS.

Warning Tape/Copy's ability to skip bad blocks is only available when using Tape/Copy's EXCP copy engine, as Tape/Copy cannot cause another copy utility (IEBGENER, SORT, etc.) to skip bad blocks of data.

The EXCP-SKIP-UNREADABLE-BLOCKS parameter has three available settings:

NO - the default setting that tells Tape/Copy to terminate the copy operation if any bad blocks are encountered.

YES - tells Tape/Copy to skip up to the first 100 bad blocks of the dataset before terminating the copy operation.

PROMPT - tells Tape/Copy to produce a WTOR to prompt user when a bad block is detected. The user can then make the decision whether they wish is terminate the copy operation immediately or if they wish to skip up to the first 100 bad blocks of the dataset before terminating the copy operation.

Warning If the bad blocks are skipped the output tape will not have all of the blocks that were on the input tape. If this cannot be tolerated the user should not use Tape/Copy's block skipping feature. The user should instead try to recreate the data, if possible, or use another software utility that is intended for reading bad blocks.

When Tape/Copy Skips Bad Blocks

- When Tape/Copy (at the user's request) skips bad blocks, the following occurs:
- The input tape is placed in the BADMEDIA member of the Tape/Copy PARMLIB library so that it excluded from future selection by Tape/Copy processes.
- The conversion job will end with a condition code of four (CC=4) as a warning to the user.
- The following line will appear on the Conversion Report above the dataset that has skipped blocks to alert the user that the bad blocks were skipped.

  ```
  THE FOLLOWING COPY OPERATION SKIPPED UNREADABLE INPUT BLOCKS.
  SEE THE SKIPPED BLOCK REPORT
  ```

- A Skipped Block Report will be produced that lists all skipped blocks by dataset.

Skipped Block Report

This report is produced by the Conversion job whenever blocks are skipped. The report has an entry for each bad input block that was skipped over during a Tape/Copy EXCP copy operation, and gives a total of the number of blocks skipped for each dataset. The volser the bad block was on is also listed along with the datasets position on that volser and its position within the dataset as a whole (if the dataset spans more than one volume).

Example

```
DATASET:  OT08.FB.P3000

VOLSER BAD BLOCK WAS ON: 001040
BLOCK NUMBER ON VOLSER :         174
BLOCK NUMBER IN DATASET:         174

VOLSER BAD BLOCK WAS ON: 001040
BLOCK NUMBER ON VOLSER :         348
BLOCK NUMBER IN DATASET:         348

DATASET:  OT08.FB.P3000
TOTAL BLOCKS SKIPPED IN ENTIRE DATASET:           2
```

18 Stacking Tapes with Tape/Copy

Topics Covered In This Chapter

Benefits of Stacking with Tape/Copy (page 18-2)

Stacking Options and Procedure (page 18-3)

Additional Stacking Features Available (page 18-5)

Stacking Groups (page 18-6)

Stacking Limitations (page 18-10)

Restart Management (page 18-10)

Introduction

One of Tape/Copy's key features is stacking tape datasets. Stacking is an invaluable tool that can be used to reduce off-site storage costs and save floor space. Tape/Copy can move single datasets together to create new stacked tapes and also select previously stacked datasets and move them to new, better utilized tapes.

Using the Stacking options available through Tape/Copy's ISPF panels, as well as the many available user parameters, the user can customize the stacking of their Tape/Copy output tapes to meet the data center's needs.

Tape/Copy offers the user the ability to control the capacity to which each output tape is filled when stacking tape datasets. This process limits the amount of tape datasets that the conversion jobs need to process while still assuring that high density media, such as 3590, is utilized efficiently.

Tape/Copy can calculate the size of each input dataset (by multiplying the block size by the block count) and then select the proper number of datasets to fill the output tape to the capacity specified by the user. Tape/Copy determines the logical capacity of the output tape by using the specified output media type along with the industry standard capacity information for the device type (as listed in the TAPENAME member of the Tape/Copy PARMLIB).

Benefits of Stacking with Tape/Copy

Tape dataset stacking with Tape/Copy offers several benefits that may be exploited for more effective tape library management. Some of these benefits would be:

- C**onsolidation of long term storage tape datasets**. Some tape datasets may need to be kept for many years for legal reasons but they may never be read again. Stacking these long term tape datasets together reduces the number of tapes that need to be used.
- **Reduction of off site vault storage costs**. Stacking tape datasets that are being sent to an off site storage vault will reduce the number of vault storage slots needed, thereby reducing the expense of off site storage space costs.
- **Creating duplicate copies of tape datasets for disaster recovery**. Creating duplicate copies of single tape datasets for disaster recovery processes can potentially double the expense of managing a tape library. Stacking disaster recovery tape dataset duplicates will reduce the number of tapes needed for disaster recovery, reduce the amount of physical tape handling by tape library personnel, reduce the amount of on site and off site storage space needed, reduce the cost of shipping tapes for disaster recovery tests and maintain the overall expense of disaster recovery to more reasonable levels.
- **Place more tape datasets under automation control**. Automated tape libraries (ATLs) and virtual tape libraries (VTLs) are expensive and have a limited number of slots available. Stacking multiple datasets into each slot will allow the device's automation process to handle more datasets, more efficiently.

Stacking Options and Procedure

In order to generate stacking conversion jobs, the user should utilize one of Tape/Copy's "mass selection" options, such as the Mass Copy option. Stacking is not available through the Copy on Demand option. Use the Candidate Selection panel to specify the criteria by which the input tape datasets should be selected. Then complete the Candidate Job Parameters panel, which is used to specify the reports Tape/Copy should generate from the Candidate Selection process.

After the first two panels have been completed, the Conversion Job parameters panel will be displayed. This panel is where the user specifies the characteristics for the conversion jobs and output tapes, which includes stacking options. Complete the other fields on the Conversion Job Parameters panel as desired, then to tell Tape/Copy that the output datasets should be stacked onto the output tapes, set the Output File Stacking field to **STACK**.

When the Output File Stacking field is set to **STACK**, it enables the user to access the "pop-up" panel for setting stacking options. This panel is called the Stacked Output Options panel. Place **YES** in the Set STACK Options field to display the panel (see example below). Once these stacking options (discussed on the next page) are completed along with the rest of the Conversion Job Parameters panel, Tape/Copy will submit the Candidate Selection job to select the datasets meeting the user's criteria and will create conversion job JCL that will stack those candidate datasets according to the values set on the Stacked Output Options panel.

```
------------  OpenTech Tape/Copy System RX.X.X  -----------
-----------------  Stacked Output Options  ----------------
COMMAND ===> ____________________________________________
Candidate Sort Field: __________ None,Crtdt,Expdt,Cxpdt,DSN
Stack Control DSN Prefix: ____________________________________
Output Tape Limit:       _____     None,1-999
   Minimum Percent Used: _____
   Percent Used Cutoff:  _____
Co-Location Table:       ________  Edit: ___
Stacking-Group-Name:     ________
Press ENTER to continue.
```

The Stacked Output Options panel allows the user to specify:

- How the candidates should be sorted (or not sorted at all), as the conversion job JCL is being created. (*Candidate Sort Field*)
- What the name of the Stack Management Control dataset should be. (*Stack Control DSN Prefix field*)
- How many output tapes should be created by each conversion job. (*Output Tape Limit field*)
- To what percentage should each stacked output tape be filled, at minimum. (*Minimum Percent Used field*)
- How much data (specified as a percentage) should be put onto each conversion job to create a stacked output tape before Tape/Copy closes the conversion job and starts creating another. (*Percent Used Cutoff field*)
- The name of the co-location table to be used when stacking to pre-existing volumes.

- The group name suffix is appended to the <dynamic allocation prefix>.stackgrp prefix to identify the name of the control file to be used to manage stacking to pre-existing volumes. Specifying this value as NONE signifies that stacking to pre-existing volumes is not being used.

Note The main purpose of the Percent Used Cutoff field is to supply a “buffer” size. If Tape/Copy selected enough data to fill the logical capacity of a tape 100% and the data gets less than the average compression then the data would actually overflow to two tapes. Specifying a Percent Used Cutoff of 90 allows a 10% buffer to absorb those potential overflow cases.

The average compression ratios that Tape/Copy uses are detailed in the TAPENAME member of the Tape/Copy PARMLIB library. If your average compression ratio is less than the industry standard, or if you notice that Conversion jobs are consistently overflowing you should reduce the percentage specified in the Percent Used Cutoff field.

STACKED-OUTPUT-VOLUME-FITTING

Another parameter to be considered when stacking is the STACKED-OUTPUT-VOLUME-FITTING parameter. This parameter controls the algorithm used to add volume sets to the conversion jobs as they are being built by the Candidate Selection process. This parameter cannot be set using the ISPF panels. To change its default value the user must add the parameter and value to the USERSETS member of the Tape/Copy PARMLIB, or to the PGMSETS DD of the Candidate Selection job.

The default value for the STACKED-OUTPUT-VOLUME-FITTING parameter is **FIRST**. This setting causes Tape/Copy to add volume sets to the conversion jobs as they are read from the Tape/Copy work files. As each volume set is read its total size is checked against the current total amount of data on the conversion job. If the volume set being read would cause the conversion job to exceed the percent specified by the user as the Cutoff Percentage, the current conversion job is “closed” and a new one is begun.

The other option available for the STACKED-OUTPUT-VOLUME-FITTING parameter is **BEST**. Using the **BEST** setting, rather than close off the current conversion job if the volume set being read would cause the tape to exceed the requested capacity, Tape/Copy will write the volume set to a temporary file and then check the next input volume set to see if that would fit on the tape without exceeding the Cutoff Percentage the user specified. Tape/Copy will keep checking for the “best” volume sets for that tape to fill it. After the conversion jobs have been built to produce as many full output tapes as possible, a conversion job will be built to copy the overflow datasets that were placed in the temporary file.

As its name indicates, the **BEST** allows Tape/Copy to do the best possible job of meeting the target Cutoff Percentage volume capacity, but to do that it must process the datasets in the candidate file many more times than if **FIRST** had been used. Therefore, **BEST** should only be used when the number of candidate datasets is not very large (less than 100,000, for example). If selecting a large number of candidate datasets, setting STACKED-OUTPUT-VOLUME-FITTING: **BEST** could cause the Candidate Selection job to run for several hours longer than usual.

Additional Stacking Features Available

To further customize Tape/Copy's stacking processes, the following additional features are available.

Stack Management Control

Since some tape management systems will expire the entire stacked volume based on the expiration of the first file on the stack, Tape/Copy offers the Stack Management Control feature. Using this feature, Tape/Copy will add a control dataset as the first file on the stack, giving that control dataset permanent retention. Once all of the files on that volume set have expired, the Stack Management Control clean-up utility will update the control dataset's retention so that the volume will be flagged for scratch and expired by the tape management system's scratch job.

Note See Chapter 19 for more information on Stack Management Control.

Stacking Conflict Avoidance

To minimize the occurrence of dataset contention resulting from two or more datasets that need to be used by the same job step being stacked onto the same tape, Tape/Copy provides a Stacking Conflict Avoidance feature. Stacking Conflict Avoidance uses SMF history to determine which datasets may need to be used at the same time, and will not stack these datasets on the same tape.

Note See Chapter 20 for more information on Stacking Conflict Avoidance.

Stacking Co-Location

Tape/Copy also provides a Co-Location feature that allows the user to create tables defining which datasets should be stacked together and which should be stacked onto different tapes. The Co-Location feature allows the user to separate datasets into Co-Location "groups", with each group of datasets being processed by a separate conversion job. Datasets can be divided using many criteria, including dataset name, retention date/type, creating job name and more.

Note See Chapter 21 for more information on the Co-Location feature.

Stacking Groups

Tape/Copy and VDR have the ability to stack datasets being copied to a pre-existing Tape/Copy or VDR volume. This function uses several new parameters to control the usage of this new feature and uses a co-location member to group datasets for copying.

The new parameters are:

- STACKING-GROUP-NAME:

  This parameter identifies the final node name of the Stacking Groups Control dataset. It is appended to the dataset name which is comprised of <dynamic allocation prefix>.STACKGRP.<STACKING GROUPNAME>. If this parameter is specified as NONE, then the Stacking Groups function is not used.

- STACKING-GROUP-CO-LOCATION-VALUE:

  This parameter specifies the Co-Location rules member name in the Tape/Copy Parameter Library that contains the co-location rules to be used with the Stacking Groups function.

To implement the Stacking Groups function, it is necessary to create a co-location rules member in the Tape/Copy parameter library using any name that meets your needs and conforms to Z/OS PDS member naming standards. The contents of the co-location member define the rules that the Tape/Copy functions will use to group the datasets and permit stacking to pre-existing volumes.

The following example of a co-location rules member which could be used for stacking datasets on pre-existing volumes:

```
*
* COMPARE         COMPARE
*RULE  FIELD   OP DATA
*----+ +-----+ -- +-------------------------------------------+
IF     DSN     EQ OT11AZ.VTSO0/
THEN   DSID1111
IF     DSN     EQ OT11AZ.VTSO1/
THEN   DSID2222
IF     DSN     EQ OT11AZ.VTSO2/
THEN   DSID3333
DEFAULT DSID9999
```

In the above example, for each of the IF statements, the dataset is compared to the COMPARE DATA and if equal the THEN statement sets the co-location rules value or Dataset ID (DSID) to the value specified.

In the above example, if a dataset named OT11AZ.VTS01.TEST.FILE001 were to be matched against the compare rules, a match would occur on the compare rule if DSN EQ OT11AZ.VTSO1/ and the co-location DSID of DSID1111 would be assigned.

If a dataset name fails to match any of the compare rules, the default co-location DSID of DSID9999 would be assigned.

Note For more information on Co-Location rules processing, refer to Chapter 21, “Co-Location Facility”.

Execution Flow

Candidate Selection Process

During the CANDIDATE SELECTION process, if the STACK-GROUP-NAME is anything other than NONE, the volumes that were initially selected as candidates are further grouped by using the values in the Co-Location rules member name specified in either the USERSETS or PGMSETS member in the Tape/Copy parameter library. For each unique group of candidates, the co-location rule value assigned will be used to find a corresponding entry in the Stacking Groups Control dataset.

If a match occurs, a check is made to ensure that the selected entries status is AVAILABLE, if not the volume selected is rejected. If no match is made for the co-location rule value, then processing will continue as if the Stacking Groups function were not in use.

Otherwise, the CANDIDATE SELECTION process will determine the file sequence number of the last dataset on the pre-existing output volume identified by the entry selected from the Stacking Groups Control dataset, and will add 1 to that value to develop the next file sequence number to be used and generate the execution JCL with the appropriate information. The entry in the Stacking Groups Control dataset is updated to reflect that a conversion is PENDING and the Candidate Selection process will continue with the selection process.

Conversion Process

During the CONVERSION process, if the Stacking Groups function is in effect the CONVERSION process will first check the dataset volume serial number currently being processed against the entries in the Stacking Groups Control dataset. If a match occurs, the status of the matched entry in the Stacking Groups Control dataset is PENDING. When PENDING, the status of the record will be changed to IN-USE and the CONVERSION process will begin. At the completion of the CONVERSION process, the status of the entry in the Stacking Groups Control dataset will be changed back to AVAILABLE.

If the Stacking Groups function is in effect and no volumes in the control dataset match the selected volume and the value of the STACKING-GROUP-CO-LOCATION-VALUE parameter, then at the completion of the CONVERSION process a new entry will be created in the control dataset for the output volser/file sequence number with a status of AVAILABLE.

Maintenance of the Stacking Groups Control Dataset

To manage the contents of the Stacking Groups Control dataset, the utility program OTTC0048 is provided. This function provides four distinct functions as described below:

1	LIST	List the contents of the Stacking Groups Control dataset.
2	DELETEINACT	Delete all inactive records in the Stacking Groups Control dataset.

3	DELETEALL	Delete all records from the Stacking Groups Control dataset except for those considered to be comments, that is, with a "*" in byte 1 of the record.
4	SETNOTINUSE	Occasionally, it may be desirable to stop stacking to an existing volume and to begin stacking to a new volume. To accomplish this, the SETNOTINUSE function will take the volume serial number supplied on SETNOTINUSE statement and flag the entry in the Stacking Groups Control dataset to have a status of NOTINUSE. This will stop stacking to the associated Dataset ID (as specified in the related co-location rules) and specified volume serial number, and begin stacking to a new volume when the next CANDIDATE SELECTION/ CONVERSION PROCESS is executed and entries for the associated Dataset ID are selected.

EXECUTION

A JCL member exists in the Tape/Copy JCL library named PRESTKCF. This member contains the sample JCL to run the above utility functions.

The contents of the JCL member is also shown here:

```
//PRESTKCF JOB (ACCT1,ACCT2),'PROG.NAME',REGION=0M,
// CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),NOTIFY=&SYSUID
//*-------------------------------------------------------------*//
//* OPENTECH SYSTEMS - STACKING GROUPS CONTROL FILE MAINT          *//
//*                                                                *//
//* THIS JOB IS USED TO MAINTAIN THE STACK TO PREEXISTING          *//
//* VOLUME CONTROL FILE, IT SUPPORTS THE DELETION OF ALL           *//
//* RECORDS OR SELECTED RECORDS THROUGH THE USES OF CONTROL        *//
//* CARDS.                                                         *//
//*                                                                *//
//* BEFORE YOU RUN THIS JOB, DO THE FOLLOWING:                     *//
//* 1) ENSURE THAT THE JOBCARD IS VALID FOR YOUR                   *//
//* ENVIRONMENT                                                    *//
//* 2) SUBSTITUTE YOUR DATASET PREFIX FOR @DSPREFIX                *//
//* 3) UPDATE THE PARAMETERS IN THE PGMSETS DD                     *//
//* IF NECESSARY                                                   *//
//* 4) THERE SHOULD BE NO '@' (AT SIGNS) IN THE JOB STREAM         *//
//* WHEN YOU SUBMIT IT.                                            *//
//* 5) THERE ARE TWO PARMLIB STATEMENTS WHICH MUST BE              *//
//* SPECIFIED (SEE THE DOC BELOW)                                  *//
//* 6) SYSIN IS THE DDNAME WHICH WILL USED TO READ THE             *//
//* EXECUTION CONTROL STATEMENTS.                                  *//
//* 7) OPTIONAL - TO RUN THE JOB IN SIMULATION MODE,               *//
//* PUT A COMMA AFTER PGM= STATEMENT AND REMOVE THE                *//
//* ASTERISK FROM COLUMN 3 IN THE PARM='SIM' LINE                  *//
//*                                                                *//
//*-------------------------------------------------------------*//
//*
//S010 EXEC PGM=OTTC0048
//* PARM='SIM' <-BYPASS CONTROL FILE UPDATES
//*
//STEPLIB DD DISP=SHR,DSN=@DSPREFIX.TAPECOPY.LOADLIB
//OTPRMLIB DD DISP=SHR,DSN=@DSPREFIX.TAPECOPY.PARMLIB
//*
//PGMSETS DD *
*
* THE STACKING-GROUP-NAME PARAMETER IS CONCATINATED WITH THE
* <DYNAMIC-ALLOCATION-PREFIX>.STACKGRP. STRING TO SPECIFIY THE
* NAME OF THE STACK GROUPS CONTROL FILE.
*
STACKING-GROUP-NAME: ???????? <NAME OF STACK GROUP TO BE MAINTAINED>
/*
//*
//SYSIN DD *
*
* THERE ARE FOUR FORMS OF THE CONTROL STATEMENTS WHICH MAY BE USED
* LIST, DELETEALL, DELETEINACT and SETNOTINUSE:
*
* THE DELETEALL STATEMENT MUST BEGIN IN POSTION 1 OF THE CONTROL
* STATEMENT AND IF PRESENT WILL CAUSE ALL NON-COMMENT RECORDS IN
* THE CONTROL FILE TO BE DELETED.
*
* THE DELETEINACT STATEMENT MUST BEGIN IN POSITION 1 AND WILL DELETE
* ALL INACTIVE RECORDS IN CONTROL FILE
*
* THE LIST STATEMENT WILL LIST ALL CONTROL RECORDS IN THE SPECIFIED
* STACK GROUP CONTROL FILE
*
* THE SETNOTINUSE: STATEMENT HAS ONE OPERAND, IT'S THE PRIMARY VOLUME
* SERIAL NUMBER OF THE ENTRY TO BE SET TO NOTINUSE STATUS. THE SELECTED
* RECORD MUST HAVE POSTION 1 OF ITS RECORD SET TO BLANK AND THE STATUS
* OF THE SELECTED RECORD MUST BE AVAILABLE. THE OPERAND/VOLUME SERIAL
* NUMBER STARTS SOMEWHERE AFTER POSITION 12 OF THE STATEMENT AND
* SPECIFIES THAT A NON-COMMENT ENTRY WHOSE VOLSER MATCHES THE ONE
* SPECIFIED IN THE SETNOTINUSE: CONTROL STATEMENT WILL HAVE ITS STATUS
* CHANGED FROM AVAILABLE TO NOTINUSE.
*
* EXAMPLES:
* 1        1 2
* 1...5....0....5....0
*
* DELETEALL
*
* DELETEINACT
*
* LIST
*
* SETNOTINUSE:XXXXXX
*
//
```

Stacking Limitations

TapeCopy cannot stack onto active tape volumes. The tape copy conversion job will always request a scratch mount as the output tape.

Unless stacking to pre-existing volumes is being used, in which case the Candidate selection job will select the proper volume based on the values in the co-location parmlib member in use.

Restart Management

TapeCopy has the ability to resume a MOVE or COPY conversion job to a stacked tape after the original conversion is interrupted (by abend or cancellation). Restarting occurs on an input VOLSET boundary, so restarting is appropriate for stacked tapes only.

In most instances, TapeCopy will not require any special handling to perform a restart. The conversion job is resubmitted and TapeCopy will resume writing to the end of the same output volume.

TapeCopy has parameters that can disable the Restart Manager on a system-wide or a job boundary.

The following are considerations for the Restart Manager operation:

1. The output tape must be stacked. If the Candidate Selection is for ASIS or UNSTACKED, no RESTART-MANAGEMENT-IDENTIFIER is generated. The Restart Manager operates only if a RESTART-MANAGEMENT-IDENTIFIER exists.
2. The original RESTART-MANAGEMENT-IDENTIFIER assigned to the conversion job must be in the PGMSETS input stream. This identifier links the interrupted job to the resumed or restarted job.
3. The control statements in INFILE should be the same for all instances of the job (that is, the input for the failed job and the restarted job must be consistent as far as the INFILE control statements).
4. A restarted job resumes at the end of the same output volume that was being used before the conversion job was interrupted.
5. The Restart Manager uses a VSAM dataset known as the RESTART dataset. This dataset contains a list of active RESTART-MANAGEMENT-IDENTIFIERs. Each one is an entry representing a footprint for the most recently completed input VOLSET finished by a conversion job.
6. If a RESTART dataset does not exist, the Restart Manager will create one automatically.
7. During a restart, the Restart Manager bypasses all work up through and including the VOLSET recorded in its RESTART file. Prior to the restart point, entries are reported in the reject report with reject codes M0074. After the VOLSET in the checkpoint is encountered, COPY or MOVE operations begin on the next input VOLSET.
8. When a conversion job ends without interruption at the end of the job, the current restart management identifier is removed from the RESTART dataset.

9. If you change the name of the Restarted Job, it will have a minor effect on the final line on the Audit Log Report. It causes “Tape Successully Converted” to have an incorrect value for the “Written” value.

If the customer tries to resubmit a completed job, the following items can happen:

a. If the resubmitted job is a COPY job, it is a rerun as opposed to a restart; and the COPY creates a new output volume.

b. If the resubmitted job is a MOVE, the input no longer exists and all MOVE requests are rejected.

Turning off Restart Management

1. If RESTART-MANAGEMENT-IDENTIFIER is removed from PGMSETS, the Restart Manager logic is bypassed. This provides a mechanism to disable Restart Management for the duration of one job.
2. Setting RESTART-MANAGEMENT-DATASET-PREFIX to NONE in USERSETS will disable the Restart Manager.

Reporting by Restart Manager

1. RESTARTU, a utility job found in TapeCopy’s JCLLIB, provides reporting for the RESTART dataset’s content and deletes entries over 14 days old. If PARM=SIM is added on the JCL EXEC-statement, the utility program reports the RESTART dataset’s content without deleting any entries.
2. The customer may add //$RESTART DD SYSOUT=* to any conversion job and the conversion job will produce the same restart content report as RESTARTU.

The following reports are from the RESTARTU job and they depict successive executions of an interrupted conversion job.

In the test scenario below, an interrupted job was copying ten VOLSETs to volume V00344. The chosen input consisted of ten generations of three GDG files. The GDG bases were OT.GDGFILE1, OT.GDGFILE2, and OT.GDGFILE3. There were exactly ten VOLSETs; each VOLSET contained three files that were single generations from each GDG. The example test job tried to copy the ten VOLSETs, but the job was intentionally cancelled midway through its execution.

The job with JESID JOB00648 was the original job and it failed after it completely copied VOLSET V00357. OT.GDGFILE3.G0005V00 happened to be the third and last dataset on V00357. The job was cancelled while the VOLSET for G0006V00 was in progress. The report was from RESTARTU which executes OTTC0018.

The restarted job was JOB00667 as depicted by the second detail line in the second report. The second report was actually produced by the conversion job JOB00667 with a // $RESTART dd-card added to the JCL. The input and output dataset names were OT.GDGFILE3.G0010V00. The status became “FINISH” and the reported entry was deleted from the RESTART dataset when JOB000667 completed.

The first line in both reports contains input information and information about the first conversion job. The second line contains output information and information about the most recent job containing restart identifier OT170000.20100708.092030. Before a restart,

the second line contains the interrupted job; later it contains restarted instances of the conversion job.

```
REL 2.7.1  PTF 2                                    T A P E / C O P Y                                                PROGRAM OTTC0018
DATE:  07/08/2010   TIME:  12:12:05     PENDING RESTART INFORMATION FOR OT.TEST.TAPECOPY                                 PAGE     01

KEY                        DSNAME                                       TYP VOLSER FILE JOBNAME  JESID    DATE       TIME     STATUS
+-----------------------+ +-----------------------------------------+ +-+ +----+ +--+ +------+ +------+ +--------+ +------+ +----+
OT170000.20100708.092030   OT.GDGFILE3.G0005V00                          IN V00357    3 OT170000 JOB00648 07/08/2010 09:34:49
                (OUTPUT)   OT.GDGFILE3.G0005V00                         OUT V00344   15 OT170000 JOB00648 07/08/2010 09:35:12

------------------------------------------------------------ END OF REPORT ------------------------------------------------------------
```

Figure 18-1 Example RESTART File Content Report from RESTARTU

```
REL 2.7.1  PTF 2                                    T A P E / C O P Y                                                PROGRAM OTTC0003
DATE:  07/08/2010   TIME:  16:03:42     PENDING RESTART INFORMATION FOR OT.TEST.TAPECOPY                                 PAGE     01

KEY                        DSNAME                                       TYP VOLSER FILE JOBNAME  JESID    DATE       TIME     STATUS
+-----------------------+ +-----------------------------------------+ +-+ +----+ +--+ +------+ +------+ +--------+ +------+ +----+
OT170000.20100708.092030   OT.GDGFILE3.G0010V00                          IN V00396    3 OT170000 JOB00648 07/08/2010 09:34:49 FINISH
                (OUTPUT)   OT.GDGFILE3.G0010V00                         OUT V00344   45 OT170000 JOB00667 07/08/2010 16:03:40

------------------------------------------------------------ END OF REPORT ------------------------------------------------------------
```

Figure 18-2 Example RESTART File Content Report from Conversion Program

New Reject Message

When a Tape/Copy conversion job is resubmitted for restart, the Restart Manager rejects VOLSETs previously handled by the earlier instance of the conversion job. In this case, the reject reason is M0074. Datasets and VOLSETs associated with restarted conversion job will receive this reject condition message until Tape/Copy's Restart Manager has encountered its restart point. Note the example below.

```
REL 2.7.1  PTF 2                                    T A P E / C O P Y                                                PROGRAM OTTC0003
DATE:  07/08/2010   TIME:  16:03:42     DATASET REJECTION REPORT FOR OT.TEST.TAPECOPY                                    PAGE      1
MSGID  DATASET NAME                                VOLSER  REJECTION REASON

M0074  OT.TAPE.GDGFILE1.G0001V00                   V00350  BYPASSED BY RESTART MANAGER
M0074  OT.TAPE.GDGFILE1.G0002V00                   V00352  BYPASSED BY RESTART MANAGER
M0074  OT.TAPE.GDGFILE1.G0003V00                   V00353  BYPASSED BY RESTART MANAGER
M0074  OT.TAPE.GDGFILE1.G0004V00                   V00354  BYPASSED BY RESTART MANAGER
M0074  OT.TAPE.GDGFILE1.G0005V00                   V00357  BYPASSED BY RESTART MANAGER

REL 2.7.1  PTF 2                                    T A P E / C O P Y                                                PROGRAM OTTC0003
DATE:  07/08/2010   TIME:  16:03:42     CONVERSION REPORT FOR OT.TEST.TAPECOPY                                           PAGE      1

                                                     INPUT FILE(S)--TAPE--------------+  OUTPUT FILE(S)--TAPE-------------+
DATASET NAME-----------------------------+ RETENTION TYPE VOLSER  SEQ STAT. BLKSZE   BLK CNT  VOLSER  SEQ STAT. BLKSZE   BLK CNT

OT.TAPE.GDGFILE1.G0006V00                     PERMANENT      V00369    1 CCC02  27998         4  V00403   16 UUC02  27998         4

OT.TAPE.GDGFILE2.G0006V00                     PERMANENT      V00369    2 CCC02  27998         4  V00403   17 UUC02  27998         4

OT.TAPE.GDGFILE3.G0006V00                     PERMANENT      V00369    3 CCC02  27998         4  V00403   18 UUC02  27998         4

OT.TAPE.GDGFILE1.G0007V00                     PERMANENT      V00391    1 CCC02  27998         4  V00403   19 UUC02  27998         4

OT.TAPE.GDGFILE2.G0007V00                     PERMANENT      V00391    2 CCC02  27998         4  V00403   20 UUC02  27998         4

OT.TAPE.GDGFILE3.G0007V00                     PERMANENT      V00391    3 CCC02  27998         4  V00403   21 UUC02  27998         4

OT.TAPE.GDGFILE1.G0008V00                     PERMANENT      V00394    1 CCC02  27998         4  V00403   22 UUC02  27998         4

OT.TAPE.GDGFILE2.G0008V00                     PERMANENT      V00394    2 CCC02  27998         4  V00403   23 UUC02  27998         4

OT.TAPE.GDGFILE3.G0008V00                     PERMANENT      V00394    3 CCC02  27998         4  V00403   24 UUC02  27998         4

OT.TAPE.GDGFILE1.G0009V00                     PERMANENT      V00395    1 CCC02  27998         4  V00403   25 UUC02  27998         4

OT.TAPE.GDGFILE2.G0009V00                     PERMANENT      V00395    2 CCC02  27998         4  V00403   26 UUC02  27998         4

OT.TAPE.GDGFILE3.G0009V00                     PERMANENT      V00395    3 CCC02  27998         4  V00403   27 UUC02  27998         4

OT.TAPE.GDGFILE1.G0010V00                     PERMANENT      V00396    1 CCC02  27998         4  V00403   28 UUC02  27998         4

OT.TAPE.GDGFILE2.G0010V00                     PERMANENT      V00396    2 CCC02  27998         4  V00403   29 UUC02  27998         4

OT.TAPE.GDGFILE3.G0010V00                     PERMANENT      V00396    3 CCC02  27998         4  V00403   30 UUC02  27998         4
0TAPES SUCCESSFULLY CONVERTED:  READ:       5     WRITTEN:        1     TOTAL FILES CONVERTED:       15
```

Figure 18-3 Example of M074 Reject Message

19 Stack Management Control

TOPICS COVERED IN THIS CHAPTER

Stack Management Control Process (page 19-2)

Stack Management Control Clean-Up Utility (page 19-3)

Introduction

Some tape management systems determine the expiration/scratch status of a volset (a volume set with multiple datasets) by the status of the first dataset on the volset. This means that when the first dataset is expired, the entire volset and all of the datasets on it are expired. This overrides the expiration controls of all the other datasets on the volset.

Note Tape/Copy's Stack Management Control feature allows the user to control the expiration of volsets by only allowing the volset to expire if every dataset on the volset has expired using its own individual expiration mechanism.

This feature of Tape/Copy is very valuable to those who wish to stack datasets but their tape management systems expiration processes can cause premature expiration of the stacked tapes due to the first dataset on the volset expiring.

Warning This feature is not available for Control-T users running a release prior to Control-T R6.0.

Stack Management Control Process

The Stack Management Control feature works by having Tape/Copy add a Stack Management Control dataset as the first file on a stacked volset. The control dataset is cataloged and given a permanent expiration date so that it will not expire before all of the other datasets on the volset.

The Stack Management Control dataset created by using the value of the CNV-JOB-STACK-CNTL-FILE-PREFIX parameter as the prefix. After the defined prefix, the next node will be the name of the conversion job that is creating the control dataset. The two nodes that follow will contain the date (Dyyyyddd) and time (Thhmmss) of the control dataset creation. The Stack Management Control file prefix should also be placed in the STKCNTL member of the Tape/Copy PARMLIB to identify the stacks under Stack Management Control to the clean-up job (see next page).

Example

If the CNV-JOB-STACK-CNTL-FILE-PREFIX parameter is set to 'OT.TAPECOPY' and conversion job OT01C001 is creating the control dataset at 12:30:02 on 2002.109, the Stack Management Control dataset that gets created will be named:

```
OT.TAPECOPY.OT01C001.D2002109.T123002
```

By default, when users are selecting datasets to be moved and stacked (DATA-COPY-FUNCTION: MOVE and OUTPUT-FILE-FORMAT: STACK), Tape/Copy will reject all potential candidates if there is no Stack Management Control file prefix specified (CNV-JOB-STACK-CNTL-FILE-PREFIX: NONE). This default setting (controlled by the ALLOW-STACKING-WITHOUT-STACK-CNTL-FILE parameter, which is set to NO by default) prevents Tape/Copy from stacking datasets to an output tape that could possibly

expire prematurely if the first file on the tape is not the file with the longest retention period.

Warning In order to force Tape/Copy to move and stack files without using a Stack Management control file as the first file on the stacked output tape, the user must set the ALLOW-STACKING-WITHOUT-STACK-CNTL-FILE parameter to YES.

Special Considerations

A parameter (CATALOG-CYCLE-CONTROL-GRACE-DAYS) has been provided to allow users to specify a number of “grace days” to add to the expiration date of catalog control and cycle control datasets at the time the clean-up utility determines that the dataset should be expired.

Stack Management Control Clean-Up Utility

The Stack Management Control Clean-Up utility is provided to determine when the volset should be expired. The clean-up utility should be scheduled to run once a day (more or less often, depending on your data center’s individual needs). The JCL for this utility is located in the STKCLEAN member of the Tape/Copy JCLLIB library.

The Stack Management Control Clean-Up utility checks each dataset on the volset to see if it has expired, updating the expiration date in the tape management database in the process, if necessary. If the clean-up process finds that all user datasets on the volset are expired, it expires and uncatalogs the control dataset, allowing the volset to be expired and scratched.

Note The Stack Management Control Clean-Up utility uses the STKCNTL member of the Tape/Copy PARMLIB to determine whether or not the first dataset in the volset is a Stack Management Control dataset.

Users should put the dataset name prefix patterns used as the value of the CNV-JOB-STACK-CNTL-FILE-PREFIX parameter for their conversion jobs into the STKCNTL member to identify the prefixes used for control datasets to Tape/Copy.

For customers who use TLMS, another option is available. This option is to use the Enhanced Stack Cleanup process, which utilizes a simulation of the TLMS RMF rules to determine the eligibility of datasets to be scratched.

To activate this enhanced process, the customer needs to be running TLMS as their TMC and include the PERFORM-TLMS-RMF-ENHANCED-STACK-CLEANUP: parameter in USERSETS or PGMSETS and specify YES for this parameters value.

Stack Managed Cleanup Expiration Report

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTC0049

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     STACK MANAGED CLEANUP EXPIRATION REPORT FOR OPENTECH_SYSTEMS,_INC.                PAGE      1

                                          CREATE                  FILE ORIG           CURRENT
DATASET NAME                             DATE     1STVOL VOLSER SEQ  EXPDT          EXPDT          STATUS        REASON

OT.VDRLA1.VSTKCTL.F0000.D2006137.T1340369    2006/137 000097 000097    1 PERMANENT      2006.168       STACK EXP,    ALL DSETS EXP
OT.VDRLA1.V000087.F0001.A0001.SFSV.DATASET   2006/103 000097 000097    2 2006.138       2006.138       ALREADY EXP,
OT.APPLA.SZ14.DATA0002.SFMV.DATASET          2006/103 000097 000097    3 2006.100       2006.100       ALREADY EXP,
OT.VDRLA1.V000079.F0001.A0003.SFMV.DATASET   2006/103 000097 000097    4 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0001.A0007.MFSV.FILE01    2006/103 000097 000097    5 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0002.A0007.MFSV.FILE02    2006/103 000097 000097    6 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0003.A0007.MFSV.FILE03    2006/103 000097 000097    7 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0004.A0007.MFSV.FILE04    2006/103 000097 000097    8 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0005.A0007.MFSV.FILE05    2006/103 000097 000097    9 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0006.A0007.MFSV.FILE06    2006/103 000097 000097   10 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0007.A0007.MFSV.FILE07    2006/103 000097 000097   11 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0008.A0007.MFSV.FILE08    2006/103 000097 000097   12 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0009.A0007.MFSV.FILE09    2006/103 000097 000097   13 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0010.A0007.MFSV.FILE10    2006/103 000097 000097   14 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0011.A0007.MFSV.FILE11    2006/103 000097 000097   15 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0012.A0007.MFSV.FILE12    2006/103 000097 000097   16 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0013.A0007.MFSV.FILE13    2006/103 000097 000097   17 2006.138       2006.138       ALREADY EXP,
OT.VDRLA1.V000083.F0014.A0007.MFSV.FILE14    2006/103 000097 000097   18 2006.138       2006.138       ALREADY EXP,
-> VOLSET WAS EXPIRED ON THIS RUN


TOTALS FOR STACK-MANAGED CLEANUP RUN

   TOTAL TMC RECORDS READ=         891
  TOTAL VOLSETS PROCESSED=         451
    STACK-MANAGED VOLSETS=           1
 VOLSETS CHANGED THIS RUN=           1
 VOLSETS EXPIRED THIS RUN=           1
 VOLUMES EXPIRED THIS RUN=           1
DATASETS CHANGED THIS RUN=           1
DATASETS EXPIRED THIS RUN=           1

REL x.x.x  PTF x                                        T A P E / C O P Y                                        PROGRAM OTTC0049

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     STACK MANAGED CLEANUP EXPIRATION REPORT FOR OPENTECH_SYSTEMS,_INC.                PAGE      1

VOLSER OUT CODE  SLOT  #     |     OUT CODE  SLOT #  VOLSER
______ ________ ________     _     ________ ________ ______

000097          00000000     |              00000000 000097
```

A sub-report at the end of the Stack Managed Cleanup Expiration Report lists the volsers expired and their associated outcode and slot number.

A sample of the report produced by the Enhanced Stack Cleanup process for TLMS follows:

```
REL x.x.x  PTF x   ***SIMULATE***                      T A P E / C O P Y                      ***SIMULATE***    PROGRAM OTTC0049


DATE:  mm/dd/yyyy   TIME:  hh:mm:ss    TLMS RMF RULE EMULATION FOR                                                      PAGE      1
  <--------------DATASET NAME--------------->  <FSEQ> <VSER> <-JOBN-> <---------------REJECTION REASON----------------->
  OT23.DRX222U.B.BKUP.B0030001.X0902661             1 V00136 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0040001.X0902985             1 V00179 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0040002.X0902985             1 V00175 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0040003.Y0902932             1 V00360 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0050001.X0903031             1 V00183 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0060001.X0903051             1 V00368 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0060002.X0903051             1 V00363 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0060003.X0903071             1 V00389 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0070001.X0903362             1 V00204 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH
  OT23.DRX222U.B.BKUP.B0070003.X0903362                1 V00303 OPENTECH DATASET CONSIDERED SCRATCH DUE TO JOBNAME=OPENTECH


REL x.x.x  PTF x   ***SIMULATE***                      T A P E / C O P Y                      ***SIMULATE***    PROGRAM OTTC0049


DATE:  mm/dd/yyyy   TIME:  hh:mm:ss     TLMS RMF RULE EMULATION FOR  9_LPAR2                                            PAGE      2

<---------------RULE NAME   ---------------> <JOBNAM> <----------------------------RULE BUCKETS---------------------------->
<-----------MATCHING DATASET AND JOB NAME-----------> <------------------RULE MAKING INELIGIBLE FOR SCRATCH----------------->
SCR_ELIG TAP_VSN FILSQ CAT_STAT TM_CRDAT TM_LUSDT TM_KEPDT EXPAFTER DSN_CCNT DSNJCCNT <--------STATUS MESSAGE-------->

OT23.RMF3.                                          3DC00000003
OT23.RMF3.FILE01                              OT23RMF1 ***********
  NO     V00312      2   YES    2009.008 00000000 2009.011 2009.013        1        1 EXPAFTER INCR BY CTLG GRACE DAYS

OT23.RMF3.N02                                       3DC00000002
OT23.RMF3.N02.FILE01                          OT23RMF1 ***********
  NO     V00312      3   YES    2009.008 00000000 2009.010 2009.012        1        1 EXPAFTER INCR BY CTLG GRACE DAYS

OT23.RMF3.N04                                       3DC00000004
OT23.RMF3.N04.FILE01                          OT23RMF1 ***********
  NO     V00312      4   YES    2009.008 00000000 2009.012 2009.014        1        1 EXPAFTER INCR BY CTLG GRACE DAYS

OT23.RMF3.N99                                       3DC00000099
OT23.RMF3.N99.FILE01                          OT23RMF1 ***********
```

20 Stacking Conflict Avoidance

TOPICS COVERED IN THIS CHAPTER

Stacking Conflict Avoidance Database (page 20-2)
Conflict Determination (page 20-4)
DISP=MOD Datasets (page 20-5)
Discontinuing Use of Conflict Avoidance (page 20-5)

Introduction

In order to reduce occurrences where datasets normally used simultaneously are stacked together on the same tape, Tape/Copy provides the Stacking Conflict Avoidance feature.

Stacking Conflict Avoidance is a conflict management process that utilizes information from the user's SMF records to determine which datasets are normally used at the same time and places that information in the Conflict Avoidance Database (created by running the JCL in the CONFJCL member of the Tape/Copy JCLLIB). Tape/Copy then queries the database during the candidate selection process when stacking is desired (OUTPUT-FILE-FORMAT set to STACK) and attempts to prevent datasets that are used as input to the same job step from being stacked on the same output tape.

The Stacking Conflict Avoidance feature can also be used to prevent the stacking of datasets that would need to be accessed shortly after being stacked during their active period.

Using an intelligent stacking feature such as Tape/Copy Stacking Conflict Avoidance can greatly reduce the number of conflicts encountered as the result of consolidating the tape media by stacking.

Warning If you do NOT wish to utilize the Stacking Conflict Management feature of Tape/Copy, simply do not run the CONFJCL which creates the Stacking Conflict Avoidance Database and/or set the STACKED-OUTPUT-CONFLICT-PROCESSING parameter to NO in the USERSETS member of the Tape/Copy PARMLIB library.

Stacking Conflict Avoidance Database

The Stacking Conflict Avoidance Database is used by Tape/Copy to determine if two or more datasets will be in conflict with each other if stacked on the same tape.

Creating the Conflict Avoidance Database

In order to create this database, this user must run the JCL in the CONFJCL member of the Tape/Copy JCLLIB library. The job will create a VSAM file named for the value of the DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX parameter plus ".CONFLICT.DB".

Note The CONFJCL job JCL may need to be configured to adhere to data center's job card standards. Other JCL changes may need to be made, such as providing the names of your site's Tape/Copy PARMLIB and LOADLIB libraries.

You will also need to provide Tape/Copy with the dataset name of the input SMF dataset. As much SMF data as possible should be used as input in order to prevent dataset usage conflicts that occur on a monthly, quarterly or yearly basis.

You can provide Tape/Copy with the name of the SMF dataset by:

- specifying the SMF file dataset as the value of the SMF-DATASET-NAME parameter (by adding this parameter and value to the USERSETS member of the Tape/Copy PARMLIB). Use this option if the SMF file name will not change often.

  OR

- specify the SMF file dataset name on the SMFFILE DD statement in S010 of the CONFJCL job. Use this option if the SMF file name will change frequently.

All type 14, 15 and 30 records from the SMF input dataset will be selected for processing (records from all LPARS/systems are selected) unless filtered out using the include/exclude filtering. Filtering can be done on dataset name, volser, jobname or creating program name, using the Tape Copy parmlib members: INCLDSN, EXCLDSN, INCLVOLS, EXCLVOLS, INCLCRJB, EXCLCRJB, INCLCRPG, EXCLCRPG, or DD overrides to point to other members. Filtering out unneeded SMF records speeds up both the Conflict database update process and Candidate Selection, while also reducing the size of the Conflict database. If the SMF file contains records from more than one system, they may be pre-processed by IFASMFDP to select only the system IDs the user wishes to use. This allows a separate Conflict Avoidance Database to be created for each system.

The CONFJCL job will perform the following steps:

S010 - Reads the SMF type 14, 15 and 30 records and writes an extract file for each type.

S020 - Creates an extract of the tape management system's database. The SMF extract records from the previous step and the tape management system database are processed to create or maintain the Conflict Avoidance Database.

Note The CONFJCL is used to create and also maintain the Conflict Avoidance Database.

Maintaining the Conflict Avoidance Database

The Conflict Avoidance Database is self-maintained by periodically running the

CONFJCL job. The frequency of which the CONFJCL job should be run depends upon the amount of SMF data that your site collects.

Note Adding the CONFJCL job to your job scheduling package to run once or twice a week should be sufficient, but individual site requirements may vary and the frequency should be adjusted accordingly.

Running the CONFJCL to maintain the database will keep it from becoming unnecessarily large and possibly hindering job performance. Any obsolete information will be removed from the database.

Conflict Determination

Once the CONFJCL job has been successfully run and the Conflict Avoidance Database has been created, Tape/Copy considers the Conflict Avoidance feature to be “active”. Tape/Copy will then start to reference the Conflict Avoidance Database any time a candidate selection process requesting stacking is run in an attempt to identify which datasets should not be stacked together based on historical SMF data.

The following dataset scenarios will be considered “in conflict” by Tape/Copy when the Conflict Avoidance feature is being used:

- datasets that are input to the same job step
- datasets within their “active period”
- dataset with DISP=MOD

Same Job Step Datasets

Using the Conflict Avoidance feature, Tape/Copy will consider any two (or more) datasets that are used as input to the same job step to be in conflict with each other and therefore, those datasets will not be stacked onto the same output.

Datasets in Their “Active Period”

In an effort to avoid stacking datasets that would need to be accessed shortly after they have been stacked, the Conflict Avoidance feature will try to determine whether a dataset is in its “active period”.

A dataset’s active period is determined by calculating how often the dataset is used based on historical data. If Tape/Copy believes that the dataset will be used soon, it will not stack that dataset.

If there is not enough historical data (SMF records) for Tape/Copy to determine a dataset’s active period, the value of the ACTIVE-PERIOD-DEFAULT-INDAYS parameter will be used. This parameter is set to 5 (days) by default, but it may be modified by adding the parameter to the USERSETS member and assigning it a new value.

Setting the ACTIVE-PERIOD-DEFAULT-INDAYS parameter to a number that is too large may cause a large number of datasets to be rejected from stacking because Tape/Copy will see these datasets as being in their active period, therefore will treat them as possible conflicts and not stack them.

DISP=MOD Datasets

When the CONFJCL job encounters a dataset with DISP=MOD while processing the SMF records, it automatically adds the dataset to the MODDSNS member of the Tape/Copy PARMLIB library.

The MODDSNS member is used to identify datasets that have a DISP=MOD so that they can be the last dataset on a multi-file stack in case they need to be modified by a job after they have been stacked.

When a Tape/Copy candidate selection job is creating the JCL for the stacking conversion job and encounters a DISP=MOD dataset, the dataset is added to the conversion job and the job is then closed. This could result in under utilized output tapes. A good way to avoid this scenario is to exclude the datasets listed in the MODDSNS member from being selected by the candidate selection process using the Candidate Selection panel.

Simply place an entry similar to the one listed below at the bottom of the Candidate Selection panel to exclude the datasets in the MODDSNS member:

```
Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  S    DSN      E    OT.TAPECOPY.PARMLIB(MODDSNS)_____________________________
  _    ___      _    ____________________________________________________________
  _    ___      _    ____________________________________________________________
```

Discontinuing Use of Conflict Avoidance

If at anytime the user wishes to permanently discontinue use of the Conflict Avoidance feature, simply delete the Conflict Avoidance Database and make sure that the CONFJCL job is removed from the job scheduling package so that a new database is not created. The user can also set the STACKED-OUTPUT-CONFLICT-PROCESSING parameter to NO if they wish to discontinue use of the Stacking Conflict Avoidance feature.

Users should also be aware that discontinuing the use of Stack Conflict Avoidance does not remove the entries that were placed into the MODDSNS member (DISP=MOD) datasets. These entries should be manually removed from the MODDSNS member if you no longer desire to have these DISP=MOD datasets as the last dataset on a stacked tape.

21 Co-Location Facility

TOPICS COVERED IN THIS CHAPTER

Selecting the Co-Location Option (page 21-2)
Defining Co-Location Rules (page 21-3)
Co-Location Report (page 21-8)
Co-Location Table Examples (page 21-9)

Introduction

The Co-Location facility is used to control the placement of selected candidates in the conversion jobs based on a set of user-defined rules. Co-Location is primarily useful when stacking files because it allows datasets to be separated onto different stacked output tapes with similar datasets.

For example, users can set rules to cause Tape/Copy to stack datasets with the same dataset name patterns, in order to keep different application groups from being placed on the same stack or also cause Tape/Copy to stack datasets together that will expire around the same time.

Co-Location can also be used in conversion jobs without stacking (using “ASIS” or “UNSTACK” functions), however when used without stacking the Co-Location table would only be used to determine which input datasets would be processed by each separate conversion job.

Selecting the Co-Location Option

The Co-Location facility is controlled by the ACTIVE-CO-LOCATION-TABLE parameter. The parameter can be set through the Tape/Copy ISPF panels using the Tape/Copy Conversion Job Parameters panel. First select:

```
Output File Stacking: STACK  Set STACK Options: YES
```

This will cause the Stacked Output Options “pop-up” panel to be displayed when the user presses enter.

```
.-------------------------------------------------------------.
| ------------  OpenTech Tape/Copy System Rx.x.x  ----------- |
| -----------------  Stacked Output Options  ---------------- |
| COMMAND ===>                                                |
|                                                             |
|                                                             |
| Candidate Sort Field:     NONE_ None,Crtdt,Expdt,Cxpdt,DSN  |
|                                                             |
| Stack Control DSN Prefix: OT.STACK________                  |
|                                                             |
| Output Tape Limit:        NONE                              |
|    Minimum Percent Used:  70                                |
|    Percent Used Cutoff:   90                                |
|                                                             |
| Co-Location Table:        COLOCTBL   Edit: _                |
|                                                             |
|                                                             |
| ENTER to continue, PF3 to exit.                             |
'-------------------------------------------------------------'
```

On the Stack Output Options panel the user can set the “Co-Location Table:” field to the name of a Tape/Copy PARMLIB member where the Co-Location Rules are defined. The COLOCTBL member in the Tape/Copy PARMLIB has been provided as an example.

If the ACTIVE-CO-LOCATION-TABLE parameter is set to the name of a valid Tape/Copy PARMLIB member that contains Co-Location rules that the user has defined, Tape/Copy will assign a Co-Location ID to each selected candidate volume set. If the dataset did not

match any of the Co-Location rules defined, it will be assigned a Co-Location ID of 0 (zero). Only candidates with the same Co-Location ID will be placed in the same conversion job.

If the ACTIVE-CO-LOCATION-TABLE parameter is set to NONE (default), then no Co-Location processing takes place and all of the candidates selected by the Candidate Selection process will be given a Co-Location ID of 0 (zero).

Defining Co-Location Rules

The Co-Location table defined by the ACTIVE-CO-LOCATION-TABLE parameter must contain valid Co-Location rules. The Co-Location rules use a simple IF - AND - OR logic making them easy to define. Each line in the Co-Location table may only specify one statement.

Each Co-Location statement consists of:

- An optional **rule logic modifier** (IF, AND, OR, NEW) which may be sub-modified with the BY modifier.
- The **tape management system field compare code** to be compared against.
- The **comparison operator** (EQ, NE, GT, etc.).
- The **comparison data** or table name. Comparison data can be specific character strings or character pattern strings for matching fields like dataset name (DSN) and creating job name (CJOB). It can also be a numeric date, a relative date or a keyword date for matching date field such as expiration date (EXPDT) and create date (CDATE).

Example

```
  File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(COLOCTBL) - 24.01            Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 *      COMPARE    COMPARE
000002 *RULE   FIELD  OP  DATA
000003 *----+ +-----+ -- +-----------------------------------------+
000004 IF     EXPDT   GT 12/31/2010
000005 *
000006 NEW    DSN     EQ OT.APPLA./
000007 AND BY CJOB    EQ >CLCJOB
****** **************************** Bottom of Data ****************************
```

An example of using the co-location table function to control stacking to pre-existing volumes.

```
EDIT       OT.OTSCLM.OT11.TCPRMLIB(COLOCTB9) - 01.13       Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
***************************** Top of Data ******************************
*
* CO-LOCATION RULES TABLE
*
*  COPYRIGHT (C) OPENTECH SYSTEMS, INC., 2001, 2002.
*  ALL RIGHTS RESERVED.
*
*********************************************************************
*
*  TABLE ENTRY COLUMN DESCRIPTIONS:
*
*
*      COMPARE    COMPARE
*RULE   FIELD  OP  DATA
*----+ +-----+ -- +-----------------------------------------+
IF     DSN     EQ OT11AZ.VTSO0/
THEN   DSID1111
IF     DSN     EQ OT11AZ.VTSO1/
THEN   DSID2222
IF     DSN     EQ OT11AZ.VTSO2/
THEN   DSID3333
DEFAULT DSID9999
  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

Rule Logic Modifier

The rule logic modifier is used to specify how the Co-Location statement is processed relative to the previous statement in the table.

IF, NEW, AND, OR Modifiers

If the rule logic modifier is **IF** or **NEW**, or not specified (blank), then the current statement becomes the first statement of a new Co-Location rule.

If the rule logic modifier is **AND**, this indicates that the previous statement and the current statement are part of the same rule and both statements must be “true” for a candidate to be assigned to this Co-Location group.

If the rule logic modifier is **OR**, this indicates that the previous statement and the current statement are part of the same rule and either statement must be “true” for a candidate to be assigned to this Co-Location group.

BY Sub-Modifier

The **BY** rule logic sub-modifier can be used with any of the rule logic modifiers or by itself (which is the same as when it is specified with **IF** or **NEW**). The **BY** sub-modifier is helpful in reducing the number of statements that must be coded in the Co-Location table to create separate Co-Location groups because the user can provide a list of comparison criteria in the form of a table.

The **BY** sub-modifier requires that the comparison data is a table name (a member within the Tape/Copy PARMLIB library) and it causes a different Co-Location group to be created for each entry in the table.

If the rule logic sub-modifier of **BY** is specified, any statements that follow the **BY** statement must begin a new Co-Location group. Specifying a rule logic modifier of **OR** or **AND** on the statement following a **BY** statement will result in a warning messages and the **OR** or **AND** statement will be ignored.

Tape Management System Field Compare Code

The tape management system field compare code is used to identify which tape management system field Tape/Copy should compare the user-defined comparison data.

Field Compare Code	Description
ACCTNUM	Account number
ATLID	Automated tape library name
CDATE	Creation date
CDDNAME	Creating DD name
CEXPDT	Calculated expiration date
CJOB	Creating job name
CPGM	Creating program name
CSTEP	Creating job step name
DSN	Dataset name
EXPDT	Expiration date
KBSIZE	Size of the file in kilobytes
LDATE	Last used date
LDDNAME	Last used DD name
LJOB	Last used job name
LPGM	Last used program name
LSTEP	Last used job step name
OUTCODE	Outcode / Vault ID / Location ID
VOLSER	First volser of file

Comparison Operators

The following table provides a list of the comparison operands supported for Co-Location processing.

Comparison Operator	Description
EQ	Equal
NE	Not equal
GT	Greater than
LT	Less than
GE	Greater than or equal
LE	Less than or equal

Comparison Data

The valid formats for comparison data are character data, date values and Tape/Copy PARMLIB library members that contain character data or date values.

Character data can either be specific values or generic/pattern values (using valid OpenTech Systems wildcard standards - see Appendix A for a list of OpenTech Systems wildcards). Character data is the expected data type when comparing the following tape management system fields:

ACCTNUM	CSTEP	LSTEP
ATLID	DSN	OUTCODE
CDDNAME	LDDNAME	VOLSER
CJOB	LJOB	
CPGM	LPGM	

Date values can be either:

- **Specific dates** - provided in Julian (yyyy.ddd) or Gregorian (mm/dd/yyyy) format.
- **Relative dates** - specified by a single numeric value and are calculated as a number of days from the current date.
- **Keyword dates** - used to specify the expiration value used for candidates that use special expiration criteria. The valid keyword date values are:

PERMANENT	UNKNOWN
CYCLECNTL	DATECNTL
FOREIGN	MOVEIMMED
LDATE	USERDATE
ELAPSEDDAYS	STATSDATE
CATLGDATE	CATALOG

Note Internally, Tape/Copy stores all keyword dates as a Julian date (9900.001 or higher). Therefore, if the EXPDT field value is less than 9900.001 it is considered a specific date expiration value.

Using a Table as Comparison Data

The Co-Location feature will also accept the name of a Tape/Copy PARMLIB member as the comparison data. The PARMLIB member will need to contain a table of character data or date values (as defined on the previous page). The PARMLIB member name should be prefixed by a '>' symbol to distinguish it from standard comparison data.

For example:

```
>COLODATA
```

COLODATA would need to be a member in the Tape/Copy PARMLIB library.

If used as the comparison data for an IF, NEW, AND or OR statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and any datasets that match any of the entries will be selected for that Co-Location group.

Note Each entry in the PARMLIB member table will be part of the same Co-Location ID.

If used as the comparison data for a BY statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and each entry in the member will generate a separate Co-Location group.

Note Each entry in the PARMLIB member table will create a new Co-Location ID.

Co-Location Report

The Co-Location Report is listed on the Rules Processor Report produced during the Candidate Selection process and serves as a cross reference between the user-defined Co-Location rules and the Tape/Copy generated Co-Location ID's. This report is written to DD RULESRPT and is generated when ACTIVE-CO-LOCATION-TABLE is set to a value other than “NONE”.

Note The RULESRPT DD is also written to by other similar “rules processing” functions such as Output File Reblocking, and the VDR Recovery to Disk option. Therefore, the RULESRPT DD may contain more than just the Co-Location Table Report.

Warning The Co-Location Report will not list the statement specified by a BY rule logic sub-modifier. It will list the rules that were generated based on the BY statement and the contents of the table it specified.

```
RELEASE x.x.x   PTF LEVEL x                              T A P E / C O P Y                                PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CO-LOCATION TABLE REPORT FOR OPENTECH_SYSTEMS,_INC.                        PAGE      1

 CO-LOCATION        TMS
 +---ID----+      +FIELD+    +----------------COMPARE DATA----------------+

           1  IF  EXPDT   EQ 9999.999
           2  IF  EXPDT   EQ 9999.000
           3  IF  EXPDT   EQ 9998.000
           4  IF  EXPDT   EQ 9998.000
           5  IF  EXPDT   EQ 9992.000
           6  IF  EXPDT   EQ 9990.000
           7  IF  EXPDT   EQ 9990.000
           8  IF  EXPDT   EQ 9989.000
           9  IF  EXPDT   EQ 9988.000
          10  IF  EXPDT   EQ 9986.000
          11  IF  EXPDT   EQ 9982.000
          12  IF  EXPDT   EQ 9900.001
          13  IF  EXPDT   LE 2001.049
          14  IF  EXPDT   LE 2001.079
          15  IF  EXPDT   LE 2001.109
          16  IF  EXPDT   LE 2001.199
          17  IF  EXPDT   LE 2002.019
          18  IF  DSN     EQ OT.APPLA./
          19  IF  DSN     EQ OT.APPLA./
              AND DSN     NE >CLDSN1
                                *.DATA0005/
                             OR *.DATA0004/
                             OR *.DATA0001/
          20  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ OT08EOV2
          21  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ OT08EOV1
          22  IF  DSN     EQ OT.APPLA./
              AND CJOB    EQ OT08
          23  IF  DSN     EQ OT.APPLA./

              AND CJOB    EQ X
```

Co-Location Table Examples

Example 1

```
     File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
   ------------------------------------------------------------------------------
-
   EDIT       OT.TAPECOPY.PARMLIB(COLOCTBL) - 24.01           Columns 00001 00072
   Command ===>                                                  Scroll ===> CSR
   ****** ***************************** Top of Data
******************************
   000001 *      COMPARE    COMPARE
   000002 *RULE   FIELD  OP  DATA
   000003 *----+ +-----+ -- +----------------------------------------+
   000004 IF     EXPDT   GT 12/31/2010                 *RULE #1
   000005 *
   000006 NEW    DSN     EQ OT.APPLA./                 *RULE #2
   000007 AND    EXPDT   GE 01/01/2005                 *RULE #2
   000008 *
   000009 IF     DSN     EQ OT.APPLA./                 *RULE #3
   000010 OR     DSN     EQ OT.APPLB./                 *RULE #3
   000011 *
   000012 BY     DSN     EQ >COLOCDSN                  *RULE #4-?
   ****** **************************** Bottom of Data
****************************
```

- Rule #1 will cause any candidates that have an expiration date greater than 12/31/2010 to be assigned to Co-Location ID 1.
- Rule #2 will select any candidates whose dataset name matches the pattern OT.APPLA./ and that have an expiration date greater than or equal to 01/01/2005.

Note Note that since rule #1 selected all candidates with an expiration date greater than 12/31/2010, the candidates that are selected by rule #2 are actually limited to the expiration date range 01/01/2005 through 12/31/2010 because all of the candidates with higher expiration dates were already assigned to Co-Location ID 1 by rule #1.

- Rule #3 selects any candidates with a dataset names that matches either OT.APPLA./ or OT.APPLB./ and assigns them to the same Co-Location group (Co-Location ID 3).
- Rule #4 generates multiple rules based on the contents of the COLOCDSN member of the Tape/Copy PARMLIB. For each dataset name pattern listed in the COLOCDSN member, a separate rule will be generated that will select dataset names that match that pattern and assign them each to separate groups (each entry in the COLOCDSN table will create a new Co-Location ID).

Example 2

This example shows grouping candidates by expiration date range and type.

The **BY** rule logic sub-modifier and a comparison data table named EXRNGTYP

(expiration range and type) will create sixteen unique Co-Location IDs/groups to separate candidates by their expected expiration date.

Co-Location Table Example

```
  File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(COLOCTBL) - 24.01            Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 *      COMPARE    COMPARE
000002 *RULE   FIELD  OP  DATA
000003 *----+ +-----+ -- +-----------------------------------------+
000004 BY     CEXPDT  LE  >EXRNGTYP           *RULE #1
000005 *
****** **************************** Bottom of Data ****************************
```

Comparison Data Table Example

```
  File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(EXRNGTYP) - 24.01            Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 30            * EXPIRING WITHIN 30 DAYS GROUP
000002 90           * EXPIRING WITHIN 90 DAYS GROUP (31-90 DAYS)
000003 180            * EXPIRING WITHIN 180 DAYS GROUP (91-180 DAYS)
000004 365           * EXPIRING WITHIN 365 DAYS GROUP  (181-365 DAYS)
000005 UNKNOWN       * EXPIRING IN MORE THAN 365 DAYS AND UNKNOWN
000006 *                SPECIAL EXPIRATION TYPE GROUP
000007 DATECNTL      * KNOWN SPECIAL EXPIRATION TYPE GROUPS
000008 MOVEIMMED.    *
000009 USERDATE      *
000010 STATSDATE     *
000011 CATALOG       *
000012 CATLGDATE     *
000012 ELAPSEDDAYS   *
000012 LDATE         *
000012 FOREIGN       *
000012 CYCLECNTL     *
000012 PERMANENT     *
****** **************************** Bottom of Data ****************************
```

Example 3

This example shows grouping candidates by application group using dataset name patterns (high-level qualifiers).

This example just uses plain **IF** rules with character pattern compare data to create four Co-Location IDs/groups based on the dataset name high-level qualifier.

The **OR** rule logic modifier is used with the PRODC datasets (in rule #3) so that all three high-level qualifiers are put into the same group. The modified pattern for the PRODD application group (rule #4) would produce the same results.

Note that any candidates that do not match any of these four rules would be placed in Co-Location group 0 (zero).

```
  File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(COLOCTBL) - 24.01            Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 *      COMPARE    COMPARE
000002 *RULE   FIELD  OP  DATA
000003 *----+ +-----+ -- +-----------------------------------------+
000004 IF     DSN     EQ PRODA./               *RULE #1
000005 *
000006 IF     DSN     EQ PRODB./               *RULE #2
000007 *
000008 IF     DSN     EQ PRODC1./              *RULE #3
000009 OR     DSN     EQ PRODC2./
000010 OR     DSN     EQ PRODC3./
000011 *
000012 IF     DSN     EQ PRODD?./              *RULE #4
****** **************************** Bottom of Data ****************************
```

22 Recyling Stacked Tapes

TOPICS COVERED IN THIS CHAPTER

Stacked File Qualification Options (page 22-2)

Introduction

The Tape/Copy Recycle feature allows users to copy non-expired files from multi-file volume sets. The jcl to invoke this function is generated via a new TapeCopy ISPF function, Recycle Stacked Tapes. The generated jcl invokes program OTTC0066.

This feature was designed to allow users to "recycle" multi-file volume sets that contain datasets with mixed expiration dates. This would allow the files that had not yet expired to be moved to a new volume, and then expiring the input tape so that it could be scratched and reused. Recycling these multi-file volume sets would reduce the occurrences of having one valid (possibly small) dataset on a stacked tape which prevents the tape from being scratched and/or fully utilized. In addition to using retention as the selection criteria for recycling tapes, Tape/Copy allows the user to select the files to be recycled based on any of Tape/Copy's available selection criteria (such as, select by dataset name - INCLDSNS).

The following topics in this chapter discuss parameter settings relating to the Recycle feature:

- Stacked File Qualification Options
- Selecting by Volume Set Size/Percentage Used

Stacked File Qualification Options

The STACKED-FILE-QUALIFICATION parameter is used to tell Tape/Copy how to test stacked files for Candidate Selection qualification.

The Stacked Tape Recycle function has been updated to accept only STACKED-FILE-QUALIFICATION: EACH, specification of any other value will result in a parameter error. When using STACKED-FILE-QUALIFICATION: EACH, Tape/Copy selects only the datasets on the tape that match the user specified selection criteria. Only those selected datasets will be copied/moved to the output tape by the Tape/Copy conversion job.

Warning Important notes regarding the use of STACKED-FILE-QUALIFICATION: EACH

- Only files that were not rejected by Candidate Selection will be copied during the copy operation. The datasets selected from the volume set will be listed on the Candidate Dataset Listing Report, whereas the datasets rejected from further processing will be listed on the Dataset Rejection Report. It is possible to have the same volser on each of the reports, but a given dataset should never appear on more than one report.
- The PGMSETS DD of the Tape/Copy conversion jobs by a Candidate Selection job that had STACKED-FILE-QUALIFICATION: EACH will contain the BYPASS-END-OF-VOLSET-TEST: YES parameter setting. This setting is used because the EACH stacking qualification may cause the last file on the stack to be excluded from processing.
- The volume counts listed on the Candidate Dataset Listing Report and the Tape Conversion Forecast Report will reflect the total number of volumes in the volume set, which may be more than the number of volumes that will actually be copied by

the conversion job. (However, the volume count listed accurately reflects the number of input tapes that will be expired after the conversion job when using DATA-COPY-FUNCTION: MOVE).

- Caution should be used using the STACKED-FILE-QUALIFICATION: EACH with MOVE operations (DATA-COPY-FUNCTION: MOVE). When these two settings are used together the selected files are moved from the input tape to the output tape and the input tape is then marked for expiration. If there are valid datasets on the input tape that were not selected, and therefore not moved by Tape/Copy to the output tape, the input tape will still be marked for scratch!

Warning The following error message will display on the Tape/Copy ISPF panels when Stacked File Qualification is set to EACH and Data Copy Function is set to MOVE, to alert user's of this issue. Press enter to continue or PF3 to change your options.

```
*********************************************************
*                                                       *
*                      **WARNING**                      *
*                                                       *
* You have specified Stacked File Qualification = EACH  *
* with Data Copy Function = MOVE, together these        *
* options can result in Tape/Copy expiring active data  *
*                                                       *
* Please review the STACKED-FILE-QUALIFICATION parm      *
* description in the Parameter Reference Guide          *
* before proceeding                                     *
*                                                       *
*                                                       *
* ENTER to Generate JCL   or    PF3 to Return           *
*                                                       *
*********************************************************
```

Selecting by Volume Set Size/Percentage Used

Tape/Copy allows users to select volume sets by the accumulated size of all of the selected datasets in that volset. The USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE parameter value is typically set using the ISPF dialog. The user changes "Dataset" in the "Dataset Size" label to "Volset" on the Candidate Selection panel for Mass Copy, ACS Copy, etc. This will cause the generated Candidate Selection job to have USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE: YES specified in the PGMSETS DD.

For example:

***Dataset* Size: Min ___0 B Max _100 G**

Would be changed to:

***Volset* Size: Min ___0 B Max _100 G**

USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE: YES

(Selecting by Volset Size)

When USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE is set to YES, the MINIMUM-DATASET-SIZE and MAXIMUM-DATASET-SIZE parameter values are tested against the computed size of **all files in the volume set**. The computed size of the volume set is the accumulation of the computed file size for all files in a volume set unless STACKED-FILE-QUALIFICATION is set to EACH.

When STACKED-FILE-QUALIFICATION is set to EACH, the computed size of the volume set is the accumulation of the computed file size for each file that is selected for processing.

For example: If USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE: YES and STACKED-FILE-QUALIFICATION: EACH is used, only the files that meet the user's candidate selection criteria will be accumulated to determine the volset size. The files that don't match the user criteria are not counted towards the total size of the volume set.

USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE: NO

(Selecting by Dataset Size, not Volset Size)

When USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE is set to NO, the MINIMUM-DATASET-SIZE and MAXIMUM-DATASET-SIZE parameter values are applied to the size of each file, not to the entire volume set.

Specifying Percentage Used Criteria

When USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE is set to YES, the MINIMUM-DATASET-SIZE and MAXIMUM-DATASET-SIZE parameters allow a unit designator of "%" to be used. This is in addition to the unit designators available when selecting by dataset size (M for megabytes, G for gigabytes, etc.).

The % character in the unit designator field will tell Tape/Copy to compute to what percentage that the volume set is "full" or utilized, and compare that computed percentage to the values specified in the Volset Size: Min and Max fields.

If the volume set percentage utilized is greater than the percentage specified in the Volset Size: Max field, the volume set is excluded from further processing. If the volume set percentage utilized is less than the percentage specified in the Volset Size: Min field, the volume set is also excluded from further processing.

For Example:

```
Volset  Size:    Min ___5 %          Max __90 %
```

Using the above settings would cause any volume sets using less than 5%, or more than 90% of their calculated capacity, to be rejected by the Candidate Selection process.

23 Unstacking or Extracting Tape Datasets

Topics Covered In This Chapter

Tape Dataset Unstacking (page 23-2)

Tape Dataset Extraction (page 23-4)

Tape Dataset Unstacking

Tape/Copy provides users with a means of unstacking tape datasets from stacked tapes onto single tapes. Several reasons a user may want to unstack datasets are listed below.

- Bringing tape dataset stacks out of long term storage for processing. Stacking tape datasets is an efficient and cost effective method for long term tape dataset storage but if these datasets need to be processed several years from the time they were originally stacked, they may not be stacked in such a way that the processing program can read them. Unstacking these tape datasets remedies that situation.
- One or more datasets on a stacked tape may need to be extended and these tape datasets are not the last dataset on the tape. The stacked tape may be unstacked so that these tape datasets can be extended, then the files can be restacked again.
- A program needs to use several tape datasets that are stacked together at the same time. The Tape/ Copy Unstack feature is a quick and easy way to unstack these tape datasets so that they are on separate tapes and are able to be processed simultaneously.
- Tape datasets that were stacked together for disaster recovery cost containment reasons are now needed. The user can run a Candidate Selection job to select these tapes and unstack all of the stacked datasets onto separate tapes inside or outside an ATL/VTL.

Unstacking Using Tape/Copy

Tape/Copy allows the user to specify an unstack operation in one of two ways, depending on the user's requirements and the number of tapes to be unstacked.

1. Copy on Demand for unstacking one tape or a small number of tapes. The user must create a list of the volsers to be unstacked.
2. Mass Copy for unstacking tapes when the volsers are not known and/or there are many tapes to unstack.

Unstacking with Copy on Demand

The Copy on Demand option (selection number 2 from the Tape/Copy Primary Selection panel) should be used if the user knows the actual volser or volsers that need to be unstacked.

In order to specify one volume set to be unstack, enter the volser on the Specify Input Tape Dataset: Vol field on the Copy on Demand panel.

If the user has a list of volsers they want to unstack, these volsers can be placed into a dataset and provided to Tape/Copy using the Mass Copy Volume File DSN field. The dataset that contains the volser list must adhere to the following:

- Must be a fixed or fixed block dataset (RECFM-F or RECFM=FB, and LRECL=80).
- One 6-character tape volume serial number can be listed per line in the Mass Copy Volume File dataset.
- An * in the first column of the record will treat the record as a comment.
- Only one volser needs to be specified if the tape is multi-volume, as Tape/Copy will acquire the full volser chain from the tape management system.

- There is no limit to the number of tape volsers you can enter.

After providing Tape/Copy with the volser or dataset name contain a volser list, the Output File Format field needs to be set to **UNSTACK**. This will tell Tape/Copy to create and submit a conversion job that will unstack the volser(s) specified through the Copy on Demand panel onto separate output tapes.

Note See Chapter 28 for complete information on the Copy on Demand panel options.

Unstacking with Mass Copy

The Mass Copy option (selection number 1 from the Tape/Copy Primary Selection panel) should be used if the user needs to unstack a range of volumes or if they want to select volumes to be unstacked but do not know the volume serial numbers.

Using the Candidate Selection panel, the user specifies the desired selection criteria in order for Tape/Copy to select the tapes the user wants to unstack. The Stacked Files field on the Candidate Selection panel can be set to **ONLY**, so that Tape/Copy only selects stacked tapes that meet the user's criteria. The user completes the Candidate Selection and Candidate Job Parameters panel, then proceeds to the Conversion Job Parameters panel. On the Conversion Job Parameters panel, the user needs to set the Output File Stacking field to **UNSTACK** and set the reminder of the conversion job options as desired.

After completing all three ISPF panels required by the Mass Copy option, Tape/Copy will generate a Candidate Selection job to find tapes meeting the user's criteria and will then build conversion jobs to unstack those selected stacked tapes to separate tapes.

Note See Chapter 27 for complete information on the Mass Copy panel options.

Tape Dataset Extraction

Tape/Copy provides an extraction feature that allows users to extract one dataset from a stacked tape and move that dataset to a separate tape, leaving the other stacked files on the input tape intact. The user may need to extract a dataset from a stacked tape if a customer has requested the dataset at another location and they do not want to send the other datasets that are on that stacked tape, or if two datasets on a stacked tape are in contention with each (need to be used by the same job step of the same job).

Extracting a Dataset Using Tape/Copy

The Copy on Demand option (selection number 2 from the Tape/Copy Primary Selection panel) is used to invoke the Tape/Copy Extraction process. The user either needs to specify the dataset name (if cataloged) in the Specify Input Tape Dataset: Dataset Name field, or the volser and file sequence number (if uncataloged) that corresponds with the dataset they want to extract from the stacked tape.

After providing Tape/Copy with the dataset name or volser and file sequence number of the dataset, the Output File Format field needs to be set to **EXTRACT**. This will tell Tape/Copy to create and submit a conversion job that will extract the volser specified through the Copy on Demand panel onto a separate output tape.

Note See Chapter 28 for complete information on the Copy on Demand panel options.

24 Tape Analysis & Compare Utility

Topics Covered In This Chapter

How It Works (page 24-2)
Tape Analysis Utility (page 24-2)
Tape Compare Utility (page 24-3)
Tape Analysis & Compare Reports (page 24-4)

Introduction

The Tape Analysis & Compare Utility provided with Tape/Copy is a stand-alone process that can be used to analyze the contents of tapes and also to compare datasets on tapes or entire volume sets (one or more volumes with multiple datasets stacked on them).

How It Works

The Tape Analysis Utility uses EXCP with proprietary channel programming so it can process any type of tape and perform the most accurate analysis of the contents. As it is reading a tape it performs a number of checks on the data and labels and reports any "exceptions" it finds. These checks include looking for things such as incorrect Block Descriptor Words for RECFM=VB, invalid record lengths, and invalid spanned segments.

Note Tapes using the Large Block Interface (introduced in OS/390 R2.10, allowing tape datasets to have block sizes up to 256K) are supported by the Tape Analysis & Compare Utilities.

Tape Analysis Utility

The Tape Analysis function is used to analyze either a single tape dataset (SCOPE=DATASET), a volume set with multiple datasets stacked on one or more tapes (SCOPE=VOLSET), or a single tape physical volume (SCOPE=VOLUME).

Warning Because in SCOPE=VOLUME mode the Tape Analysis program attempts to read to the very end of the tape and does not want to rely exclusively on the tape labels and tapemarks to determine when the tape "ends", it will often read one block past where it has detected what should be the end of the tape's data. This will usually cause a Unit Check condition to be reported by the tape drive, and that will show up as an IOS000I XXXX,XX,EOD/VOI,02 in the job log. That message is normal in this function and can be ignored.

When a volume is to be analyzed (SCOPE=VOLUME) the tape is treated as a "raw" physical tape and Tape Analysis reads the tape from beginning to end reporting any labels or datasets it finds. The REWIND command is used to ensure that the tape is always analyzed from its load point to the end of the data on the volume, regardless of how the tape is initially positioned -i.e. if the user positions the tape to the fourth file (4,SL) the tape will be rewound to the beginning before being analyzed. Only a single tape volume is analyzed, even if EOV labels are encountered indicating a dataset spans onto an additional volume. SCOPE=VOLUME can be used to examine and analyze a tape when the user is not sure what is on it, or what label type was used when it was created; tapes that come from outside the data center ("foreign tapes") are an example.

Note Users can generate JCL to perform a tape analysis using the Tape Analysis ISPF panels (see Chapter 31) or using the JCL sample located in the TAPANLYZ member of the Tape/Copy JCLLIB library.

The following information is required by the Tape/Copy Tape Analysis utility when coding the JCL located in the TAPANLYZ member of the Tape/Copy JCLLIB library:

- The ACTION parameter is required and must be set to ANALYZE.
- The SCOPE parameter is used to specify what is to be analyzed: (DATASET, VOLSET or VOLUME).
- The user must provide the necessary information on the DSN1 DD statement to get the dataset, volume or volume set allocated. If the SCOPE=VOLSET, a volume number of 255 must be specified as the DD volume parameter and the dataset name specified must be the first dataset on the volume set. With SCOPE=VOLSET the tape management catalog is accessed by Tape Analysis to get information for each dataset on the volume set. When SCOPE=DATASET or VOLUME the tape management catalog is not used. If using SCOPE=DATASET and listing an uncataloged datasets, all volumes for the dataset in the DSN1 DD must be listed in the JCL.

Tape Compare Utility

(Performing a compare will also cause Tape/Copy to automatically perform an analysis of the objects specified.)

The Tape Compare function is used to compare either 2 single datasets residing on separate tapes (SCOPE=DATASET), or two complete volume sets residing on separate sets of tapes (SCOPE=VOLSET). When the comparison is on volume sets (SCOPE=VOLSET), all the individual datasets on the two volume sets are compared beginning with the first dataset on each.

The compare operation terminates as soon as it finds a mismatch between the datasets it is comparing. A message is put out letting the user know at what block/record and byte within that block/record the mismatch occurred, and a dump of the last block/records from each dataset is printed. Additional compares made are on DCB information in the HDR2 labels, and on the dataset names (both from the JCL or TMC and from the last 17 bytes on the HDR1 tape label). Unlike the data block/record compares, if these compares do not match a warning message is generated but the COMPARE operation continues.

The compare operation is performed in one of two modes (MODE=PHYSICAL or LOGICAL), and the user is required to specify which MODE. In Physical mode the datasets are compared physical block to physical block. If any two blocks are not identical a mis-compare is declared. In Logical mode the "logical" records that make up a dataset are compared, rather than the physical blocks they reside in. If a dataset is copied to another dataset with a different blocksize (Tape Copy's Reblocking feature for instance) than a compare using MODE=PHYSICAL would find them to be no longer equal, whereas a compare with MODE=LOGICAL would find them equal.

Warning See Chapter 16 for more information on Dataset Reblocking.

Note Users can generate JCL to perform a tape analysis using the Tape Compare ISPF panels (see Chapter 32) or using the JCL sample located in the TAPCOMPR member of the Tape/Copy JCLLIB library.

The following information is required by the Tape/Copy Tape Compare utility using the JCL sample located in the TAPCOMPR member of the Tape/Copy JCLLIB library:

- The ACTION parameter is required and must be set to COMPARE.
- The SCOPE parameter is used to specify what is to be compared: (SCOPE=DATASET or VOLSET).
- The MODE parameter is used to specify whether physical blocks are to be compared (MODE=PHYSICAL) or logical records within the blocks (MODE=LOGICAL). If a dataset has been re-blocked MODE=LOGICAL should be used.
- The user must provide the necessary information on the DSN1 and DSN2 DD statements to get the datasets or volume sets allocated. If the SCOPE is VOLSET, a volume number of 255 must be specified as the DD volume parameter and the dataset name specified must be the first dataset on the volume set. With SCOPE=VOLSET the tape management catalog is accessed by Tape Analysis to get information for each dataset on the volume set. If using SCOPE=DATASET and listing an uncataloged datasets, all volumes for the dataset in the DSN1 DD must be listed in the JCL.

Tape Analysis & Compare Reports

Volume (Raw Tape) Analysis Report

The Volume (Raw Tape) Analysis Report is generated when the Tape Analysis function is used (ACTION=ANALYZE) with SCOPE=VOLUME. This report reports the raw characteristics on the tape, such as the label type, volser, datasets on the tape, etc. This report is useful for identifying foreign tapes or tapes that have lost their external labels.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0052

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx    VOLUME (RAW TAPE) ANALYZE REPORT FOR OPENTECH_SYSTEMS,_INC.

  VOLSER OF VOLUME: 001054

  LABEL TYPE USED FOR OPEN: SL

  DATASETS FOUND ON VOLUME:
 FILENUM DATASET NAME-----------------------------+       BLOCKS             BYTES  RECFM BLKSIZE  LRECL

       1 DSN LAST 17: OT.DOUG.QQQQQQ                          942        26,890,626    U     29002      0

  STOPPED READING TAPE DUE TO: 2 CONSECUTIVE TAPEMARKS ENCOUNTERED - NORMAL TAPE END
 ***********************************************************************************************
   VOLUME TOTALS:

        NUMBER OF DATA FILES:              1
            NUMBER OF LABELS:             12
         NUMBER OF TAPEMARKS:              4
         NUMBER OF IO ERRORS:              0
       HIGHEST USED BLOCK ID:            958
```

Dataset Analysis Report

The Dataset Analysis Report is always produced for all DSN1 datasets (DDname DSETANL1) and a second dataset analysis report (DDname DSETANL2) is produced if the ACTION is COMPARE. For each dataset analyzed this report contains a printout of the header, trailer and any user labels encountered, tapemark detected indicators, and a totals section listing counts and statistics for that dataset. If any exceptional conditions are

detected while analyzing a dataset a message is issued to alert the user and directs them to the Exception Report for further information.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0052

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DATASET ANALYSIS REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE      1

DDNAME: DSN1     DEVICE TYPE: 3490     UNIT ADDRESS: 0545

*****************************************************************************************************************************
******* FILE NUMBER:       1
*****************************************************************************************************************************

DSN: OT.DSN1.FB1.BL45000                          FIRST VOLSER: 000061 FILE SEQ 0000

HEADER LABELS FOLLOW. CURRENT VOLSER: 000061
VOL1000061
HDR1.DSN1.FB1.BL4500000006100010001      0033220000000000000IBM OS/VS 370
HDR2F000001500000OT08MAK5/S010    P   B   47000                       0000045000

************  TAPEMARK ENCOUNTERED  ************

** THE DATASET REACHED EOV ON THIS VOLUME
  BLOCKS DATASET HAD ON THIS VOLUME:            7
************  TAPEMARK ENCOUNTERED  ************
. . . . . . . . . . . . . . . . . . . . . . . . . . . .

. . . . . . . . . . . . . . . . . . . . . . . . . . . .

. . . . . . . . . . . . . . . . . . . . . . . . . . . .

. . . . . . . . . . . . . . . . . . . . . . . . . . . .

** THE DATASET REACHED EOF ON THIS VOLUME
  BLOCKS DATASET HAD ON THIS VOLUME:           40
************  TAPEMARK ENCOUNTERED  ************

TRAILER LABELS FOLLOW. CURRENT VOLSER: 000063
EOF1.DSN1.VB1.BL2000000006100010002      0033220000000000040IBM OS/VS 370
EOF2V200000800000OT08MAK5/S010    P   B   47000


************  TAPEMARK ENCOUNTERED  ************

  DATASET TOTALS FOR DATASET: OT.DSN1.VB1.BL20000

       NUMBER OF BLOCKS READ:                 40
       SIZE OF LARGEST BLOCK:              19404
      SIZE OF SMALLEST BLOCK:              13304
          AVERAGE BLOCK SIZE:              16301
 NUMBER OF LOGICAL RECS READ:                120
        NUMBER OF BYTES READ:            652,060
        NUMBER OF INPUT VOLS:                  1
```

Compare Report

The Compare Report (DDname DSETCOMP) is only produced if ACTION COMPARE is used. For each pair of datasets compared, this report lists the results of the various compare functions and indicates if the datasets compared equal or not. If the respective data blocks from the two datasets are not equal, a message indicates the block number, and which byte within the block differed.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0052

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     DATASET COMPARE REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE      1


*****************************************************************************************************************************
***** FILE COMPARE NUMBER:       1     BELOW 2 FILES WILL BE COMPARED
*****************************************************************************************************************************

DDNAME: DSN1 DSN: OT.DSN1.FB1.BL45000                          FIRST VOLSER: 000061 FILE SEQ 00001
DDNAME: DSN2 DSN: OT.DSN2.FB2.BL45000                          FIRST VOLSER: 000064 FILE SEQ 00001

HDR2 DCB INFORMATION WAS EQUAL

LAST 17 BYTES OF DSN FROM HDR1 LABELS NOT EQUAL DSN1: DSN1.FB1.BL45000 DSN2: DSN2.FB2.BL45000

TWO JFCB DSNS NOT EQUAL DSN1: OT.DSN1.FB1.BL45000                        DSN2: OT.DSN2.FB2.BL45000


THE DATASETS COMPARED ARE EQUAL

*****************************************************************************************************************************
***** FILE COMPARE NUMBER:       2     BELOW 2 FILES WILL BE COMPARED
*****************************************************************************************************************************

DDNAME: DSN1 DSN: OT.DSN1.VB1.BL20000                          FIRST VOLSER: 000063 FILE SEQ 00002
DDNAME: DSN2 DSN: OT.DSN2.VB2.BL20000                          FIRST VOLSER: 000067 FILE SEQ 00002

HDR2 DCB INFORMATION WAS EQUAL

LAST 17 BYTES OF DSN FROM HDR1 LABELS NOT EQUAL DSN1: DSN1.VB1.BL20000 DSN2: DSN2.VB2.BL20000

TWO JFCB DSNS NOT EQUAL DSN1: OT.DSN1.VB1.BL20000                        DSN2: OT.DSN2.VB2.BL20000

THE DATASETS COMPARED ARE NOT EQUAL !!!
THE LAST BLOCK READ ON EACH DATASET WAS NOT EQUAL
 DATA IN BLOCK NUMBER:            1 IS DIFFERENT AT BYTE:      117
```

Volset Analyze/Compare Report

The Volset Analyze/Compare Report (DDname VOLSETRP) lists all the datasets analyzed and compared (if ACTION COMPARE is specified) in each volset, and has totals for each volset. If ACTION COMPARE, then a message indicates whether or not the volsets compared were equal.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0052

DATE:  xx/xx/xxxx   TIME:  xx:xx:x     VOLSET ANALYZE/COMPARE REPORT FOR OPENTECH_SYSTEMS,_INC.                   PAGE      1

FILENUM DSN1 DATASET NAME ------------------------+  FIRSTVOL  FSEQ    DSN2 DATASET NAME ------------------------+  FIRSTVOL FSEQ

      1 OT.DSN1.FB1.BL45000                           000061     1    OT.DSN2.FB2.BL45000                            000064     1
      2 OT.DSN1.VB1.BL20000                           000063     2    OT.DSN2.VB2.BL20000                            000067     2

 A CONDITION WAS DETECTED THAT PREVENTS FURTHER VOLSET PROCESSING


         VOLSET REPORT TOTALS
   DSN1_DATASETS:     2  DSN1_VOLUMES:     3      DSN2_DATASETS:     2  DSN2_VOLUMES:     3

 THE TWO VOLSETS COMPARED WERE UNEQUAL OR THE COMPARE OPERATION WAS TERMINATED
```

Exception Report

The Exception Report (DDname EXCEPTRP) contains a chronological list of exceptions detected during dataset analysis. Each exception listed tells which DDNAME, dataset, volser and block it was found on and has detailed information about the exception.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0052

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     EXCEPTION REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE        1

DSN: OT.DSN2.FB2.BL45000                          DDNAME: DSN2 1STVOL: 000064 BLK#: 00000000001 CURVOL: 000064 BLK#: 00000000001
RECFM=F, LRECL NOT AN EXACT MULTIPLE OF BLKSIZE

DSN: OT.DSN1.VB1.BL20000                          DDNAME: DSN1 1STVOL: 000063 BLK#: 00000000001 CURVOL: 000063 BLK#: 00000000001
INVALID BDW DETECTED BDW: 49D80000 ACTUAL BLKSIZE:018904 REASON: BDW DID NOT MATCH ACTUAL BLKSIZE
```

Control Card Report

The Control Card Report (DDname CNTLCARD) lists the contents of the SYSIN file which contains the control cards that the user has specified for the Tape Analysis functions to be performed.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM OTTC0052

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONTROL CARD REPORT FOR OPENTECH_SYSTEMS,_INC.                      PAGE        1

ACTION COMPARE
SCOPE VOLSET
```

Block Dump

When the compare engine detects that the corresponding blocks for the two datasets being compared are not equal, those two blocks are dumped to DDname BLKDUMP, for inspection. The Compare Report will tell which byte within the block was the first to differ, or that the problem was that the two blocks were not of the same length.

25 Tape/Copy ISPF Processing

Topics Covered In This Chapter

Invoking Tape/Copy (page 25-2)

Navigating the Tape/Copy Panels (page 25-2)

Online Help (page 25-2)

Resetting Panel Values (page 25-3)

Tape/Copy Primary Selection Panel (page 25-3)

Introduction

This chapter provides an introductory overview of how to use Tape/Copy ISPF panels. The Tape/Copy panels allow users to perform a variety of functions and gives the product a lot of its versatility.

Invoking Tape/Copy

The Tape/Copy ISPF panels can be invoked in three ways:

- If Tape/Copy was added as an option on the ISPF menu at your data center, users can select Tape/Copy from the ISPF menu as they would any other menu option.
- If Tape/Copy was added to a SYSPROC or SYSEXEC concatenated dataset during installation, users can issue the TSO command:

  ```
  TSO TAPECOPY
  ```

- Tape/Copy can also be accessed by entering the following command from the TSO command panel (usually option 6 from the ISPF Main Menu):

  ```
  EX '@DSPREFIX.TAPECOPY.REXX(TAPECOPY)'
  ```

Navigating the Tape/Copy Panels

Tape/Copy's ISPF panels are navigated the same as most ISPF panels. The TAB and NEWLINE keys, as well as the mouse, can be used to move the cursor from field to field on a particular panel. Tape/Copy also uses standard PF key commands (PF3 to exit a panel, for example).

Warning The navigation of the panels is reliant upon the user's keyboard settings and the PF key definitions that are applied to the user's system.

Online Help

Tape/Copy currently offers context sensitive help on the ISPF panels. Entering a '?' in a field on the ISPF panel will bring up a box containing the valid values or format of value for that field.

No PF1 help features are available at this time, however this functionality may be added in the future.

Resetting Panel Values

Typing ‘DEFAULT’ on the command line of a Tape/Copy panel will populate all ISPF fields with the system default commands specified in the Tape/Copy PARMLIB library.

Tape/Copy Primary Selection Panel

The Tape/Copy Primary Selection Panel gives access to the Tape/Copy panels. By default, it is the first panel displayed with the Tape/Copy ISPF panels are invoked.

The selection options table in Chapter 2, “Introduction to Tape/Copy”provides a list of functions users are able to perform through each option on the Primary Selection Panel.

```
-------------------------  OpenTech Tape/Copy System  ------------------------
--------------------------  Primary Selection Panel  -------------------------
SELECTION ===>


   0  Parmlib          Modify Parameter Library
   1  Mass Copy        Multiple Tape Processing
   2  Copy on Demand   Fast Copy Single Datasets
   3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
   4  Audit Log Rpt    Generate Reports from the Audit Log File
   5  Tape Analysis    Perform analysis of tape file(s)
   6  Tape Compare     Compare tape files
   7  Recycle Stacked  Recycle Stacked Tapes

   V  VDR Options      VDR Creation and Recovery Options

   LM Tape Browse      Tape Library Management Utilities:Tape Browse

   CC Key DB Maint     CopyCrypt Key Database Maintenance

   PF3 to terminate Tape/Copy.
```

Tape/Copy’s Primary Selection Panel options are each explained in greater detail throughout this manual (with the exception of the VDR Options features, which are explained in the “Virtual Data Recovery (VDR) Guide”).

Warning The VDR Option is only available to authorized users, as this feature is available at additional cost.

Warning The Key DB Maint option only applies to CopyCrypt users. CopyCrypt is available at additional cost.

26 PARMLIB Panel Option

TOPICS COVERED IN THIS CHAPTER

Parmlib Update Selection Panel (page 26-2)

Option 0 - ISPFFACT (page 26-3)

Option 1 - USERSETS (page 26-4)

Option 2 - TAPE SELECTION (page 26-5)

Option 3 - JCL MODELS (page 26-6)

Option 4 - MISC. (page 26-7)

Option 5 - ISPF PROFILE (page 26-8)

Introduction

The PARMLIB option is selection number 0 (zero) on the Tape/Copy Primary Selection Panel. This option can be used to access several of Tape/Copy's more frequently used PARMLIB members and JCL models. These members can always be accessed using ISPF browse/edit (such as through "3.4"), but utilizing the Tape/Copy ISPF panels for this purpose adds to the ease of use of the product.

Parmlib Update Selection Panel

When selecting option 0 (zero) from the Tape/Copy Primary Selection Panel, the Parmlib Update Selection panel is displayed. The options on this panel are discussed throughout this chapter.

```
 -------------------------  OpenTech Tape/Copy System  -------------------------
--------------------------  Parmlib Update Selection  -------------------------
SELECTION ===>


   0  ISPFFACT         Browse the ISPFFACT Member

   1  USERSETS         Update the USERSETS Member

   2  TAPE SELECTION   Update Candidate Tape Selection Default Members

   3  JCL MODELS       Update JCL Model Members

   4  MISC             Update Misc. Parmlib Members

   5  ISPF PROFILE     Clear non-ISPF variables from OTTCPROF ISPF Profile


END to exit Parmlib Update Selection
```

Option 0 - ISPFFACT

This option allows users to browse the ISPFFACT member of the Tape/Copy PARMLIB. The FDRJCL member contains the “factory settings” or defaults, for the Tape/Copy parameters. These settings should never be modified by the user.

When the user selects this option, the ISPFFACT member of the Tape/Copy PARMLIB library is displayed in ISPF browse mode.

Example

```
   Menu  Utilities  Compilers  Help
 ------------------------------------------------------------------------------
 BROWSE     OT.TAPECOPY.PARMLIB(ISPFFACT) - 01.58    Line 00000000 Col 001 080
 Command ===>                                                Scroll ===> PAGE
********************************* Top of Data ***********************************
*
* VENDOR SET PARAMETERS
*
*  COPYRIGHT (C) OPENTECH SYSTEMS, INC., 1995, 2005.
*  ALL RIGHTS RESERVED.
*
*********************************************************************
***  SPECIAL NOTE - THESE PARAMETERS SHOULD NEVER BE MODIFIED BY THE
***  USER.  TO CHANGE ANY OF THESE PARAMETERS, USE THE PARMLIB MEMBER
***  USERSETS FOR THE PARAMETER OVERRIDE VALUES.
*********************************************************************
AAUTO-INCLUDE-ALL-CYCLES:               NO
ABEND-VOLSER/SLOT-TRANSLATION-ERROR:    YES
ACCOUNT-NUMBER-LOCATION:                NONE
ACTIVE-ACS-SELECTION-TABLE:             ACSTABLE
ACTIVE-CO-LOCATION-TABLE:               NONE
ACTIVE-NEWNAME-TABLE:                   NEWNAME
ACTIVE-OUT-OF-AREA-TABLE:               OBSOLETE
ACTIVE-PERIOD-DEFAULT-INDAYS:           5
```

Option 1 - USERSETS

This option allows users to view and update the USERSETS member of the Tape/Copy PARMLIB. The USERSETS member is used to override the factory set values.

When the user selects this option, the USERSETS member of the Tape/Copy PARMLIB library is displayed in ISPF edit mode.

Example

```
  File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(USERSETS) - 01.08           Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 *
000002 * USER SET PARAMETERS
000003 *
000004 *  COPYRIGHT (C) OPENTECH SYSTEMS, INC., 1995, 2002.
000005 *  ALL RIGHTS RESERVED.
000006 *
000007 ************************************************************************
000008 AUDIT-LOG-FILE-GDG-BASE-NAME:           OT05.TCR262B0.AUDITLOG
000009 CONVERSION-JCL-TARGET-DATASET-NAME:     OT05.TCR262B0.CONVJCL
000010 DUALCOPY-TAPE-LIBRARY-REPORT:           YES
000011 DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX: OT05.TCR262B0
000012 DYNAMIC-ALLOCATION-SORTWORK-UNIT:       SYSDA
000013 DYNAMIC-ALLOCATION-UNIT:                SYSDA
000014 DYNAMIC-ALLOCATION-VSAM-DATASET-NAME-PREFIX: OT05.TCR262B0.VSAM
000015 REXX-LIB-NAME:                          TCR262B0.DIST.REXX
000016 ROBOTIC-TAPE-ENVIRONMENT-PRESENT:       YES
000017 SORT-PRODUCT-NAME:                      DFSORT
000018 SORT-PRODUCT-PARAMETERS-DDNAME:         SORTCNTL
000019 STATISTICS-FILE-GDG-BASE-NAME:          OT05.TCR262B0.STATFILE
```

Option 2 - TAPE SELECTION

This option brings up the Parmlib Update Tape Selection Defaults Selection panel. This panel allows the user to access the Tape/Copy members commonly used to include or exclude tapes globally based on various criteria.

```
------------------------  OpenTech Tape/Copy System  -----------------------
--------------  Parmlib Update Tape Selection Defaults Selection  -----------
SELECTION ===>

   Exclude     Include
   Member      Member

 1 EXCLDSNS  2 INCLDSNS   Update Dataset Pattern Members
 3 EXCLVOLS  4 INCLVOLS   Update Volser Pattern Members
 5 EXCLVNDR  6 INCLVNDR   Update Vendor/Mfg. Pattern Members
 7 EXCLACT#  8 INCLACT#   Update Account Number Pattern Members
 9 EXCLDTYP  0 INCLDTYP   Update Catalog Device Type Pattern Members
 A EXCLTLBL  B INCLTLBL   Update Tape Label Type Pattern Members
 C EXCLCRJB  D INCLCRJB   Update Creating Jobname Pattern Members
 E EXCLMSGS  F INCLMSGS   Update Rejection Messages Members
 G EXCLOUTC  H INCLOUTC   Update Location/Outcode Pattern Members
I EXCLDSCJ  J INCLDSCJ  Update Dataset Name/Creating Jobname Pattern Members
```

When the user selects one of the options on the Parmlib Update Tape Selection Defaults Selection panel, the corresponding member from the Tape/Copy PARMLIB library (EXCLDSNS, INCLDSNS, etc.) is displayed in ISPF edit mode.

Example

```
 File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(EXCLDSNS) - 01.00          Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** **************************** Top of Data
******************************
000001 *
000002 * EXCLUDE DATA SET NAME IDENTIFICATION TABLE
000003 *
000004 *  COPYRIGHT (C) OPENTECH SYSTEMS, INC., 1995, 2002.
000005 *  ALL RIGHTS RESERVED.
000006 *
000007
**********************************************************************
000008 *
000009 ABC.*.XYZ
```

Option 3 - JCL MODELS

This option brings up the Parmlib Update JCL Model Selection panel. This panel allows the user to access the JCL models used by Tape/Copy to create Candidate Selection and Conversion JCL.

```
------------------------  OpenTech Tape/Copy System  -----------------------
--------------------  Parmlib Update JCL Model Selection  ------------------
SELECTION ===>

 Tape/Copy JOB Statement JCL Models:
   1  Candidate Selection Job    2  Conversion Job

 Update the Tape/Copy Conversion JCL Models:
   3  Tape/Copy Internal
   4  FDR
   5  CA-View (SAR)



END to return to Parmlib Update Selection
```

When the user selects one of the options on the Parmlib Update JCL Model Selection panel, the corresponding member from the Tape/Copy PARMLIB library or SKELS library is displayed in ISPF edit mode.

Example

```
  File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(EXCPJCL) - 01.00            Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data
******************************
000001 //TAPEIN    DD DISP=(OLD,KEEP),
000002 //             UNIT=(
000003 //             DATACLAS
000004 //             VOL=(,RETAIN,,255,SER=(      )),
000005 //             DSN=
000006 //TAPEOUT   DD DISP=(NEW,KEEP,DELETE),
000007 //             UNIT=(
000008 //             DATACLAS
000009 //             VOL=(PRIVATE,RETAIN,,255),
000010 //             DSN=
000011 //TAPEIN2   DD DISP=(OLD,KEEP),
000012 //             UNIT=(
000013 //             DATACLAS
000014 //             VOL=(,RETAIN,,255,SER=(      )),
000015 //             DSN=
```

Option 4 - MISC.

This option brings up the Parmlib Update Misc. Defaults Selection panel. This panel allows the user to access the several Tape/Copy PARMLIB members that are need to be occasionally accessed by users.

```
   ------------------------  OpenTech Tape/Copy System  -----------------------
   -----------------  Parmlib Update Misc. Defaults Selection  ----------------
   SELECTION ===>


      1  IOCNTLTB        Update the Tape Allocation Control Table
      2  PROPRIET        Update the Proprietary Data Format Selection Table
      3  LIBRYDEF        Update the Robotic Library Definition Table
      4  NEWNAME         Update the Data Set Name/Newname Definition Table
      5  NEWNAUTO        Update the Automatic Newnaming DSName Prefix Table
      6  BADMEDIA        Update the Bad Media Tracking Table
      7  LOSTVOLS        Update the Lost Tape Volumes Table
      8  ACSTABLE        Update the ACS Selection Class Identification Table


   END to return to Parmlib Update Selection
```

When the user selects one of the options on the Parmlib Update Misc. Selection Defaults Selection panel, the corresponding member from the Tape/Copy PARMLIB library (IOCNTLTB, PROPRIET, etc.) is displayed in ISPF edit mode.

Example

```
     File  Edit  Confirm  Menu  Utilities  Compilers  Test  Help
   ------------------------------------------------------------------------
   EDIT       OT.TAPECOPY.PARMLIB(PROPRIET) - 01.00         Columns 00001 00072
   Command ===>                                                Scroll ===> CSR
    ****** **************************** Top of Data
 ******************************
   000001 *
   000002 * PROPRIETARY DATA FORMAT IDENTIFICATION TABLE
   000003 *
   000004 *  COPYRIGHT (C) OPENTECH SYSTEMS, INC., 1995, 2002.
   000005 *  ALL RIGHTS RESERVED.
   000006 *
   000007
 ************************************************************************
```

Option 5 - ISPF PROFILE

This option allows users to clear non-ISPF variables from Tape/Copy's OTTCPROF ISPF Profile. Tape/Copy will reset all of the panel values back to their original settings.

When the user selects this option, the following warning panel is displayed for verification purposes.

```
-------------------------  OpenTech Tape/Copy System  -----------------------
------------------------  Clear OTTCPROF ISPF Profile  ----------------------


        ************************************************************

         **  WARNING - You are about to clear all of the          **
         **  Tape/Copy ISPF profile variables (OTTCPROF) from     **
         **  your ISPF profile.  This will cause Tape/Copy to     **
         **  repopulate these variables with the Tape/Copy        **
         **  default values the next time you execute a Tape/Copy  **
         **  function.                                            **
         **                                                       **
         **  All current variable settings in the Tape/Copy ISPF   **
         **  panels will be reset to defaults!                    **
        ************************************************************



               ARE YOU SURE YOU WANT TO CLEAR OTTCPROF? NO_




END to exit without Clearing the OTTCPROF ISPF Profile
```

- If the user hits PF3 or hits ENTER while "NO" is in the verification field, they will be taken back to the Parmlib Update Selection panel.

Warning If the user changes the verification field to "YES" and hits ENTER, Tape/Copy reset all variable settings back to their default values and will display a list of the variables and the total number of variables that were reset.

27 Mass Copy Panel Option

TOPICS COVERED IN THIS CHAPTER

Candidate Selection Panel (page 27-3)
Candidate Job Parameters Panel (page 27-17)
Conversion Job Parameters Panel (page 27-25)

Introduction

The Mass Copy option is selection number 1 (one) on the Tape/Copy Primary Selection Panel. This option is used to generate the job which selects multiple tapes for copying based on flexible user-set criteria and then creates Conversion JCL for the chosen candidates.

Note For more information on the Candidate Selection process performed by the job that is generated using the Mass Copy ISPF panels, see Chapter 9.

The Mass Copy option contains three primary ISPF panels that are completed by the user, as well as a few optional "pop-up" panels that are displayed on top of the primary panels when selected by the user. The user enters the required information on each panel and hits ENTER to proceed to the next panel.

Note All three panels must be completed before the Candidate Selection JCL is generated.

The panels appear in the order they are listed here (click the panel name to go to that panel's description):

- **Candidate Selection Panel**

  This panel is used to specify the criteria by which tapes should be selected as candidates to be copied.

- **Candidate Job Parameters Panel**

  This panel is used to specify the filtering and reporting options used by the Candidate Selection process, as well as provides a field for the user to give a dataset name if they have chosen to save the generated Candidate Selection JCL.

- **Conversion Job Parameters Panel**

  This panel is used to specify the options the user wishes Tape/Copy to use when creating Conversion JCL for the tapes selected by the Candidate Selection process, as well as the options to be used by the Conversion process.

Candidate Selection Panel

The Candidate Selection panel is used to specify the criteria by which tapes should be selected as candidates to be copied. Any combination of the listed criteria may be used.

Example

```
---------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
----------------------------  Candidate Selection  --------------------------
COMMAND ===>

Stacked File Qualification:   FIRST
(Process volume set if 1st file selected)


Dataset Size:    Min ___0 B         Max _100 G      Select on: GDG DSNs: YES_
Expiration Date: Min ________30     Max _____99999        Multi-Volume: YES_
Create Date:     Min _________0     Max _____99999       Stacked Files: YES_
Days Idle:       Min _________3     Max _____99999       Robotic Tapes: YES_
Volser Range:  From: $_____         To: 999999           Virtual Tapes: NO__
Media Type:   Input: ALL_____    Output: 036_____       Uncataloged DSNs: NO__

Label Format: Input: ALL        Output: ASIS           Expiration Type: NO__
Compression:  Input: ALL___      Output: COMP__          Volume Age/Use: YES_

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____    _    ____________________________________________________

  _    ____    _    ____________________________________________________

  _    ____    _    ____________________________________________________

  _    ____    _    ____________________________________________________


ENTER to continue, PF3 to exit.
```

```
  For the STACKED-TAPE-RECYCLE function, this Candidate Selection panel will be
shown:

  ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
-
  -----------------  Recycle Stacked Tapes Candidate Selection  ----------------
-
  COMMAND ===>

  Stacked File Qualification:   EACH_
  (Process each file individually)

  Dataset Size:    Min ___0 B          Max _100 G      Select on: GDG DSNs: YES_
  Create Date:     Min _________0      Max _____99999         Multi-Volume: YES_
  Days Idle:       Min _________3      Max _____99999        Stacked Files: ONLY
  Volser Range:  From: $_____           To: 999999           Robotic Tapes: YES_
  Media Type:   Input: ALL_____    Output: 036_____          Virtual Tapes: YES_
  Label Format: Input: ALL         Output: ASIS          Uncataloged DSNs: YES_
  Compression:  Input: ALL___      Output: COMP__          Expiration Type: NO__
                                                       Volume Age/Use/Clean: NO__

  Edit  Pattern  Incl
  /Sel   Type   /Excl  Dataset (containing the patterns)
    _    ____     _    ____________________________________________________
    _    ____     _    ____________________________________________________
    _    ____     _    ____________________________________________________
    _    ____     _    ____________________________________________________

  ENTER to continue, PF3 to exit.
```

Note Typing “DEFAULT” on the command line will populate all ISPF fields with the system default commands specified in the Tape/Copy PARMLIB library.

Note The fields on the panel above are discussed on the next few pages of this chapter.

Candidate Selection Fields & Defaults

The following fields appear on the Candidate Selection panel. The values the user enters into the fields on this panel will override the values of the parameters that are listed in the USERSETS member of the PARMLIB.

Stacked File Qualification: _____

Parameter: STACKED-FILE-QUALIFICATION

Default Value: FIRST

Options: This field allows the user to select stacked volume sets based on whether one or more of the files on the stacked volset meet the candidate selection criteria set by the user, or to select individual files from a stacked tape based on meeting the selection criteria separately. The valid values for this field are:

FIRST - Process the volume set if the first file in the stack is selected (most efficient option, as fewer selection tests are performed.)

ALL - Process the volume set if all of the files in the stack are selected

ANY - Process the volume set if any of the files in the stack are selected

EACH - Process only the files in the volume set that match the selection criteria

Warning When using Stacked File Qualification: EACH with Data Copy Function: MOVE (on the Conversion Job Parameters panel), all files in the input multi-file volume set will be expired at the completion of the conversion job. The user must make sure that the files that they are not selecting for conversion from the input tape do not contain valid data that should not be scratched.

Dataset Size: Min _____ _ Max _____ _

or

Volset Size: Min _____ _ Max _____ _

Parameter: MINIMUM-DATASET-SIZE

MAXIMUM-DATASET-SIZE

USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE

Default Value: 0 B

100 G

Options: These fields can be used to specify either the minimum and maximum dataset size OR the minimum and maximum volume set size for selection. Simply type over the word "Dataset" with the word "Volset" directly on the Candidate Selection panel to use the volume set size as criteria instead of the dataset size. When set to "Volset", the USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE parameter is automatically set to YES.

When set to *"Dataset"* (default), these fields allow the user to select tape datasets within the specified size range. The first part of the fields will accept numeric values with decimal entries to the hundredths (i.e. 2.35 G or 70.5 M are valid entries). The second part of the field is a unit designator that will accept the following one character values:

B for Bytes

K for Kilobytes

T for Terabytes

M for Megabytes

G for Gigabytes

When set to "***Volset***", these fields allow the user to select tape volume sets within the specified size range. The first part of the fields will accept numeric values with decimal entries to the hundredths (i.e. 2.35 G or 70.5 M are valid entries). The second part of the field is a unit designator that will accept the following one character values:

B for Bytes

K for Kilobytes

T for Terabytes

M for Megabytes

G for Gigabytes

% - This setting causes Tape/Copy to compute the volume set's percentage utilized and compare that percentage to the numeric value listed for this parameter. Any volsets less utilized than the percentage listed in the Volset Size: Min field, or more utilized more than the percentage listed in the Volset Size: Max field, will be rejected from processing.

Expiration Date: Min _____ Max _____

Parameter: MINIMUM-DAYS-UNTIL-EXPIRATION
MAXIMUM-DAYS-UNTIL-EXPIRATION

Default Value: 30
99999

Options: These fields allow the user to select only tape datasets that are set to expire between the minimum and maximum dates entered. These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Note For the Stacked Tape Recycle function, this Expiration Date Field is not shown.

Create Date: Min _____ Max _____

Parameter: MINIMUM-DAYS-SINCE-CREATION
MAXIMUM-DAYS-SINCE-CREATION

Default Value: 0
99999

Options: These fields allow the user to select only tape datasets that were created between the minimum and maximum dates entered. (The value you specify in the Min. field will tell Tape/Copy not to select anything created after that date. The value you specify in the Max. field will tell Tape/Copy not to select anything created before that date.) These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Days Idle: Min _____ Max _____

Parameter: DAYS-IDLE
MAXIMUM-DAYS-IDLE

Default Value: 3
99999

Options: These fields allow the user to select only datasets that have been used during the range of days or dates specified. These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Volser Range: From: _____ To: _____

Parameter: INPUT-TAPE-STARTING-VOLSER

INPUT-TAPE-ENDING-VOLSER

Default Value: $

999999

Options: These fields allow users to target a specific range of volume serial numbers in the tape library. Only the volsers within the specified range will be used to find candidates. If multiple volser ranges are required, a volume inclusion list needs to be defined and targeted by the “Edit/Sel Pattern Type Incl/Excl Dataset” fields at the bottom of this panel.

For multi-volume datasets, if any of the tape volume serial numbers fall within the selected range, the dataset will be selected.

Media Type: Input: _____ Output: _____

Parameter: INPUT-MEDIA-TYPE

OUTPUT-MEDIA-TYPE

Default Value: ALL

036

Options: These fields allow users to target a specific type of tape media for both input and output processes. The valid media type values for these fields are in the Media Name column in the IOCNTLTB member of the Tape/Copy PARMLIB. The Candidate Selection job will only include tapes with the Input Media Type selected unless **ALL** is specified.

ALL can be used as the Input Media Type only and will cause Tape/Copy to select from all of the media types defined as input media types in the IOCNTLTB member.

ASIS can be used as the Output Media Type only and will cause Tape/Copy to create output tapes with the same media type as the input tapes.

Example -To select datasets on 3480 tapes and create copies in VTL001, the user could select -

INPUT: 3480 OUTPUT: VTL001

Label Format: Input :____ Output: ____

Parameter: INPUT-LABEL-FORMAT
OUTPUT-LABEL-FORMAT

Default Value: ALL
ASIS

Options: These fields allow users to target a specific label type for both input and output processes. The Candidate Selection job will only include tapes with the Input Label Format selected unless **ALL** is specified.

Tape/Copy supports the following label types as input:

SL NL NSL SUL LTM AL1 AU1 AL3 AU3

and the following label types are supported for output:

SL NL NSL SUL LTM AL3 AL4

ALL can be used as the Input Label Format only and will cause Tape/Copy to select from all valid label formats.

ASIS can be used as the Output Label Format only and will cause Tape/Copy to create output tapes with the same label type as the input tapes.

Compression: Input:_____ Output: _____

Parameter: INPUT-COMPRESSION-FORMAT
OUTPUT-COMPRESSION-FORMAT

Default Value: ALL
COMP

Options: These fields allow users to target a specific compression status for both input and output processes. The Candidate Selection job will only include tapes with the Input Compression status selected unless **ALL** is specified.

COMP can be used in the input field to select only compressed tapes; or in the output field to tell Tape/Copy that the output tapes created should be compressed.

NOCOMP can be used in the input field to select only uncompressed tapes; or in the output field to tell Tape/Copy that the output tapes created should be uncompressed.

ALL can be used as the Input Compression status only and will cause Tape/Copy to select from both compressed and uncompressed tapes.

ASIS can be used as the Output Compression status only and will allow candidate selection to determine the output compression format based on the compression format of the input dataset or volume.

GDG DSNs: _____

Parameter: DATASET-NAME-TYPE

Default Value: YES

Options: This field allows the user to specify whether Generation Data Group (GDG) datasets should be included along with non-GDG datasets as candidates (**YES**), whether GDG datasets should be excluded from consideration (**NO**) or if only GDG datasets should be considered for selection (**ONLY**).

Multi-Volume: _____

Parameter: PROCESS-MULTI-VOLUME-DATASETS

Default Value: YES

Options: This field allows the user to specify whether multi-volume datasets should be included along with single volume dataset as candidates (**YES**), whether multi-volume datasets should be excluded from consideration (**NO**) or if only multi-volume datasets should be considered for selection (**ONLY**).

Stacked Files: ____

Parameter: PROCESS-STACKED-FILES

Default Value: YES

Options: This field allows the user to specify whether stacked file tapes should be included along with unstacked tapes as candidates (**YES**), whether stacked file tapes should be excluded from consideration (**NO**) or if only stacked file tapes should be considered for selection (**ONLY**).

Robotic Tapes: _____

Parameter: MOVE-FROM-ATL

Default Value: YES

Options: This field allows the user to specify whether robotic tape library resident tapes should be included along with non-robotic tapes as candidates (**YES**), whether robotic tape library resident tapes should be excluded from consideration (**NO**) or if only robotic tape library resident tapes should be considered for selection (**ONLY**).

Tape/Copy considers both real tapes in an automated tape library and virtual tapes in a virtual tape library as “robotic” and selectable by this parameter. To select by real or virtual, use the Virtual Tapes selection field also on this panel in conjunction with this field.

Virtual Tapes: _____

Parameter: PROCESS-VIRTUAL-VOLUMES

Default Value: NO

Options: This field allows the user to specify whether virtual tape library resident tapes should be included along with non-virtual tapes as candidates (**YES**), whether virtual tape library resident tapes should be excluded from consideration (**NO**) or if only virtual tape library resident tapes should be considered for selection (**ONLY**).

The Robotic Tapes field also on this panel must be set to YES or ONLY in order for virtual tapes to be selected.

Uncataloged DSNs: ____

Parameter: PROCESS-UNCATALOGED-DATASETS

Default Value: YES

Options: This field allows the user to specify whether uncataloged datasets should be included along with cataloged datasets as candidates (**YES**), whether uncataloged datasets should be excluded from consideration (**NO**) or if only uncataloged datasets should be considered for selection (**ONLY**).

Expiration Type: ____

Parameter: N/A

Default Value: NO

Options: This field is used to display the Expiration Type Selection pop-up panel. Entering **YES** in this field will bring up the Expiration Type Selection panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, and Tape/Copy will use the default settings found in DEFAULTS and USERSETS.

Expiration Type Selection Panel

```
------------  OpenTech TAPE/COPY SYSTEM Rx.x.x  -----------
---------------  Expiration Type Selection  ---------------
COMMAND ===>

Process CATALOG CONTROL Datasets:        YES   (99000)
Process CATALOG/DATE CONTROL Datasets:   YES
Process CYCLE CONTROL Datasets:          YES   (99CCC)
Process DATE CONTROL Datasets:           YES
Process ELAPSED DAYS Datasets:           YES
Process EXPIRATION DATE Datasets:        YES
Process FOREIGN Datasets:                YES   (98000)
Process LDATE Datasets:                  YES   (98DDD)
Process MOVE IMMEDIATE Datasets:         YES
Process PERMANENT RETENTION Datasets:    YES   (99365)
Process STATS DATE Datasets:             YES   (STATS/???)
Process USER DATE Datasets:              YES   (USER/???)

ENTER to continue, PF3 to exit.
```

Parameter: PROCESS-CATALOG-CONTROL-DATASETS
PROCESS-CATALOG/DATE-CONTROL-DATASETS
PROCESS-CYCLE-CONTROL-DATASETS
PROCESS-DATE-CONTROL-DATASETS
PROCESS-ELAPSED-DAYS-DATASETS
PROCESS-EXPIRATION-DATE-DATASETS
PROCESS-FOREIGN-DATASETS
PROCESS-LDATE-DATASETS
PROCESS-MOVE-IMMEDIATE-DATASETS
PROCESS-PERMANENT-RETENTION-DATASETS
PROCESS-STATS-DATE-DATASETS
PROCESS-USER-DATE-DATASETS

Default Value: YES

Options: The fields listed on this panel accept **YES** (process the expiration type) or **NO** (exclude datasets with the expiration type).

Volume Age/Use/Clean: _____

Parameter: N/A

Default Value: NO

Options: This field is used to display the Volume Age/Usage Selection pop-up panel. Entering **YES** in this field will bring up the Volume Age/Usage Selection panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, and Tape/Copy will use the default settings found in DEFAULTS and USERSETS.

Volume Age/Usage Selection Panel

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
 ---------------  Volume Age/Usage Selection  --------------
 COMMAND ===>

 Minimum Days Since Volume Birth Date:  _________0

 Minimum Days Since Volume Clean Date:  _____

 Minimum Temporary I/O Errors:          _____0

 Minimum Volume Use Count:              _____0


 ENTER to continue, PF3 to exit.
```

Minimum Days Since Volume Cleaned: ___

Parameter: MINIMUM-DAYS-SINCE-VOLUME-CLEANED

Default Value: 0

Options: This parameter allows the user to select datasets by the number of days (or date) since a volume was marked as being cleaned.

Valid Settings are:

A valid number

Julian date (YYYY.DDD)

Gregorian date (MM/DD/YYYY)

Minimum Days Since Volume Birth Date: ___

Parameter: MINIMUM-DAYS-SINCE-VOLUME-BIRTH

Default Value: 0

Options: This field allows the user to select datasets by the number if days (or date) since a volume was entered into the tape management system. The field will accept a number of days, a Julian date (yyyy.ddd) or Gregorian date (mm/dd/yyyy) entry.

Minimum Temporary I/O Errors: ___

Parameter: MINIMUM-TEMPORARY-IO-ERRORS

Default Value: 0

Options: This field allows the user to select volumes which have exceeded the minimum temporary IO error value specified. The temporary IO error value is accumulated differently for each tape management system supported by Tape/Copy. (See the related MINIMUM-TEMPORARY-IO-ERRORS parameter description in the Tape/Copy "Parameter Reference Guide" for complete details on how Tape/Copy determines the temporary IO error count.) This field will accept a numeric value in the range of 0 – 99999.

Minimum Volume Use Count: ___

Parameter: MINIMUM-VOLUME-USE-COUNT

Default Value: 0

Options: This field allows the user to select volumes by the number of volume Opens since the volume was introduced into the tape management system. (See the related MINIMUM-VOLUME-USE-COUNT parameter description in the Tape/Copy "Parameter Reference Guide" for complete details on which field the tape management system uses to determine this value.) This field will accept a numeric value in the range of 0 – 99999.

Edit Pattern Incl

/Sel Type /Excl Dataset (containing the patterns)

Parameter: N/A

Default Value: N/A

Options: **Edit/Sel**:

B - displays the specified dataset in ISPF browse mode

E - creates a member in a predefined dataset or edits the include/exclude pattern in the dataset specified

S - selects the include/exclude pattern dataset for processing

Pattern Type:

CJOB - dataset specified contains creating job name patterns

CPGM - dataset specified contains creating program name patterns

CSYS - dataset specified contains creating system name patterns

DSNS - dataset specified contains dataset name patterns

DSCJ - dataset specified contains dataset name/creation job name patterns

OUTC - dataset specified contains outcode patterns

TLBL - dataset specified contains tape label patterns

VOLS - dataset specified contains volume serial number patterns

Incl/Excl:

I - include only candidates matching the patterns in the dataset specified

E - exclude all candidates matching the patterns in the dataset specified

Dataset:

Dataset where the include/exclude patterns are defined (**NOT** the pattern itself)

Up to four include/exclude pattern datasets may be manipulated containing either "include only" or "exclude" patterns. These "pattern" datasets can contain specific fully qualified lists, or are allowed the use of OpenTech Systems' wildcards (see Appendix A for valid wildcards and their uses). The pattern dataset should be fixed block (RECFM=FB) and have a logical record length of 80 (LRECL=80).

Note In order for the Candidate Selection job to use the pattern dataset in processing, the user must place an S (select) in the Edit/Sel field before pressing ENTER to advance to the next panel.

All the default include/exclude Tape/Copy PARMLIB members that are shipped with the product for use with include/exclude processing are always processed during Candidate Selection, regardless of the include/exclude pattern datasets specified on this ISPF panel. These pre-defined PARMLIB members begin with "INCL" (include) or "EXCL" (exclude) - INCLDSNS and EXCLVOLS, for example. If the user specifies a pattern dataset on the Candidate Selection panel AND has patterns/values defined in the pre-defined

Tape/Copy PARMLIB members, Tape/Copy uses both. The user should take care not to define conflicting values.

Candidate Job Parameters Panel

The Candidate Job Parameters panel is used to specify the filtering and reporting options used by the Candidate Selection process, as well as provide a field for the user to give a dataset name if they have chosen to save the generated Candidate Selection JCL.

Example

```
   ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
   -------------------------  Candidate Job Parameters  -----------------------
   COMMAND ===>
   Save Candidate Job JCL to DSN=
OT.TAPECOPY.JCL.CNTL(R250RENM)___________________
   Candidate Job Jobcard JCL:
          //R250CAND JOB
(ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
         //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)________________________
          //*CANDIDATE SELECTION
JOB_______________________________________________
          //
*_____________________________________________________________________

  Pre-filter:                           Reports:
   Scratches:                 ENHANCED  Candidate Selection:         YES
   Tape Volser Range:         NO_       Conversion Forecast:         YES
   Dataset Names:             NO_       Conversion Forecast Detail:  YES
   Dataset Name/Creation Job: NO_       Candidate Rejection:         YES
   RACF Auth Checking:      NO________  Candidate Rejection Summary: YES
  Generate:                             Candidate Tape Pre-Pull:     YES
   Candidate Tape Pre-Pull WTOR: NO_    Bad Media:                   YES
   Conversion JCL:               YES    Lost Volumes:                YES
                                        Conversion Statistics:       YES___
  Candidate Job Restart DD Statement:


_____________________________________________________________________

  ENTER to continue to next panel, PF3 to return to previous panel
```

Note The fields on the panel above are discussed on the next few pages of this chapter.

Candidate Job Parameters Fields & Defaults

The following fields appear on the Candidate Job Parameters panel. The values the user enters into the fields on this panel will override the values of the parameters that are in the DEFAULTS and USERSETS members of the PARMLIB.

Save Candidate Job JCL to DSN=_____

Parameter: N/A

Default Value: N/A

Options: This field allows the user to specify the name of a dataset to which they would like to save the Candidate Selection job JCL. The dataset name must be fully qualified but without enclosing quotes. This feature is helpful for those who would like to save the Candidate Selection JCL and use their job scheduling package to have the JCL run at regularly scheduled intervals.

If the dataset is a preexisting PDS, the name of a member in the specified PDS should be entered along with the dataset name (ex. OT.TAPECOPY.JCL.CNTL(DCCNDSEL)). If the user wishes to create a new member within an existing PDS, they can enter the PDS name and the new member name in parenthesis and Tape/Copy will create the new member.

Warning If the member name specified already exists in the PDS, please be advised that the contents of this member will be overwritten.

If a dataset name is provided in this field, the Candidate Selection JCL will be displayed in ISPF edit mode once the user completes the next panel (the Conversion Job Parameters panel) and presses ENTER. However, if a dataset name is not provided in this field, the Candidate Selection JCL will not be saved and will not be displayed for review before the job is submitted.

Candidate Job Jobcard JCL:

Parameter: N/A

Default Value: N/A

Options: A standard JCL job card with a valid jobname and accounting information for your data center is required. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Candidate Selection job unless changed here by the user.

Pre-filter:

Scratches: _____

Parameter: PRE-EDIT-REJECTIONS

Default Value: ENHANCED

Options: This field allows the user to tell Tape/Copy if/when it should delete unused tape database entries, tapes in delete status and scratch tapes from the input file to the candidate selection program. Tape/Copy can also filter out the database entries of the datasets created before the value of the MAXIMUM-DAYS-SINCE-CREATION parameter in some cases. “Filtering” these types of unneeded database entries will improve the performance of the Candidate Selection process.

The valid values for this field are:

NO - Do not filter the input file and issue a rejection message for each scratched, deleted and unused tape database entry on the Dataset Rejection Report.

YES - Filter out unused, scratched and deleted entries during the Pre-Filter phase of data collection.

ENHANCED - Filter out the unused, scratched and deleted entries, during the Extract/Dump phase of data collection. **(CA-1 and DFSMSrmm users only.)**

CDTENH - Filter out the unused, scratched and deleted entries, as well as the datasets created before the value of the MAXIMUM-DAYS-SINCE-CREATION parameter, during the Extract/Dump phase of data collection. **(CA-1 and DFSMSrmm users only.)**

Tape Volser Range: ___

Parameter: PRE-SELECT-VOLSER-RANGE

Default Value: YES

Options: This field allows the users to specify whether or not Tape/Copy should “pre-filter” the records that fall outside of the tape volser range specified on the first panel (the Candidate Selection panel), or specified in volser inclusion or exclusion lists (INCLVOLS/EXCLVOLS).

Pre-filtering by Tape Volser Range (**YES**) will allow Tape/Copy to remove the records outside of the specified volser range from Tape/Copy’s work files earlier in the selection process so that the Candidate Selection job runs faster and does not track all of those records on its Dataset Rejection Report.

If this field is set to **NO**, Tape/Copy will track these records throughout the selection process and issue a rejection message for each of them on the Dataset Rejection Report.

Dataset Names: ___

Parameter: PRE-SELECT-DATASET-NAMES

Default Value: YES

Options: This field allows the users to specify whether or not Tape/Copy should "pre-filter" the records that do not match the dataset names that are being specifically included using the INCLDSNS and/or other dataset name inclusion list specified on the first panel (the Candidate Selection panel). Datasets that are specifically excluded (such as in the EXCLDSNS member) are also filtered.

Pre-filtering by Dataset Names (**YES**) will allow Tape/Copy to remove the records not included by dataset name from Tape/Copy's work files earlier in the selection process so that the Candidate Selection job runs faster and does not track all of those records on its Dataset Rejection Report.

If this field is set to **NO**, Tape/Copy will track these records throughout the selection process and issue a rejection message for each of them on the Dataset Rejection Report.

Dataset Name/Creation Job: ___

Parameter: PRE-SELECT-DATASET-NAME/CREATION-JOB

Default Value: YES

Options: This field allows the users to specify whether or not Tape/Copy should "pre-filter" the records that do not match the dataset names/creation job names that are being specifically included using the INCLDSCJ and/or other dataset name/creation job name inclusion list specified on the first panel (the Candidate Selection panel). Datasets that are specifically excluded (such as in the EXCLDSCJ member) are also filtered.

Pre-filtering by Dataset Name/Creation Job (**YES**) will allow Tape/Copy to remove the records not included by dataset name/creation job name from Tape/Copy's work files earlier in the selection process so that the Candidate Selection job runs faster and does not track all of those records on its Dataset Rejection Report.

If this field is set to **NO**, Tape/Copy will track these records throughout the selection process and issue a rejection message for each of them on the Dataset Rejection Report.

RACF Auth Checking: _____

Parameter: RACF-AUTHORIZATION-CHECKING

Default Value: NO

Options: This field allows the users to specify whether Tape/Copy should perform RACF authorization checking on the selected candidate datasets.

If this field is set to **NO** or **NONE**, then no authorization checking is performed on the candidates.

If this field is set to **U=xxxxxxxx** (where xxxxxxxx is a valid user id) or **CURRENT** (the user id submitting the candidate selection job), Tape/Copy will check the RACF authority of the user id to verify that this user has the authority to read/write/create the datasets selected. Datasets that the user id does not have the authority to process will be rejected by candidate selection.

Reports:

Candidate Selection: ___

Parameter: CANDIDATE-SELECTION-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Candidate Selection Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the entire Candidate Selection Report, but only print the Candidate Selection totals if datasets are selected.

Conversion Forecast: ___

Parameter: CONVERSION-FORECAST-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Conversion Forecast Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Conversion Forecast Detail: ___

Parameter: CONVERSION-FORECAST-DETAIL-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Conversion Forecast Detail Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Candidate Rejection: ___

Parameter: DATASET-REJECTION-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Dataset Rejection Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Candidate Rejection Summary: ___

Parameter: DATASET-REJECTION-SUMMARY-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Dataset Rejection Summary Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Candidate Tape Pre-Pull: ___

Parameter: TAPE-PRE-PULL-REPORT

Default Value: YES

Options: This field allows the user to specify what type of Tape Pre-Pull List Reports to produce, or whether the generation of Tape Pre-Pull List Report should be bypassed.

YES - Produce the standard Tape Pre-Pull List Report

MASTER - Produce only the Master Tape Pre-Pull List Report

BOTH - Produce both the Master Tape Pre-Pull List Report and the individual Tape Pre-Pull List Reports.

NO - Do not produce any Tape Pre-Pull List Reports.

Bad Media: ___

Parameter: BAD-MEDIA-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Bad Media Report. **YES** will cause the report to be generated (if there are entries in BADMEDIA). **NO** will tell Tape/Copy not to produce the report and not to attempt to remove volumes from the BADMEDIA parmlib member if the current create date of volser's is greater than the date listed in the BADMEDIA parmlib entry.

Lost Volumes: ___

Parameter: LOST-VOLUMES-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Lost Tape Volumes Report. **YES** will cause the report to be generated (if there are entries in the LOSTVOLS member). **NO** will tell Tape/Copy not to produce the report.

Conversion Statistics: ___

Parameter: CONVERSION-STATISTICS-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Conversion Statistics Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report. **TOTALS** will cause a report of only the grand total lines of the report to be produced.

Candidate Tape Pre-Pull WTOR: ___

Parameter: SUPPRESS-PULLLIST-REPORT-READY-WTOR

Default Value: NO

Options: This field allows the user to specify whether or not Tape/Copy should alert the console operator that the Tape/Copy Tape Pre-Pull Reports are available to be printed by issuing a WTOR message (which requires a response before the job will continue and end). **YES** will cause the WTOR to be issued and the Candidate Selection job will wait for a response before ending. **NO** will cause the WTOR to be bypassed.

Conversion JCL: ___

Parameter: CONVERSION-JCL

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce Conversion JCL for the candidates selected. **YES** will cause the Conversion JCL to be created. **NO** will cause the creation of the JCL to be bypassed.

Candidate Job Restart DD Statement:
_____

Parameter: N/A

Default Value: N/A

Options: This field provides the user with the means to pass restart information to the Candidate Selection job by using a bypass DD statement. The user can indicate whether or not Tape/Copy should bypass a phase or use a non-default input file.

This field is to be used as a JCL DD statement, such as:

//BYPSDUMP DD DUMMY

or

//BYPSDUMP DD DSN=OT.RMM.EDGHSKP

Note See Chapter 9 for full descriptions of Tape/Copy's Candidate Selection phases and instructions on bypassing phases in Tape/Copy processing.

```
  A "?" may be entered in this field to display a pop menu from which the user
 may select the desired restart dd statement.

  .-------------------------------------------------------------.
  | ------------  OpenTech Tape/Copy System Rx.x.x------------- |
  | --------------------  Restart DD Names  ------------------- |
  | COMMAND ===>                                                |
  |                                                             |
  | _ //BYPSSTAT DD DUMMY bypass statistics phase               |
  | _ //BYPSDUMP DD DUMMY bypass TMC extract phase              |
| _ //BYPSSORT DD DUMMY bypass TMC sort phase          |

  | _ //BYPSSUMM DD DUMMY bypass TMC summarize phase            |
  | _ //BYPSEXPD DD DUMMY bypass expiration date calc only      |
  | _ //BYPSFILT DD DUMMY bypass pre-edit & filtering phase     |
  | _ //BYPSCSEL DD DUMMY bypass entire candidate selection     |
  |                                                             |
  | Place an "S" or "/" next to the Restart DD you want to use  |
  | and Press ENTER to continue or Press PFK3 to cancel         |
  '-------------------------------------------------------------'
```

Conversion Job Parameters Panel

The Conversion Job Parameters panel allows the user to specify the output tape characteristics for Tape/Copy to use when creating Conversion JCL for the tapes selected by the Candidate Selection process.

Example

```
   ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
   -------------------------  Conversion Job Parameters  -----------------------
   COMMAND ===>
  Save Conversion JCL to DSN:  OT05.CONVJCL.CNTL____________________________
                   DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
  Input Tapes per job:         ___10          Files per job:       _9999
  MB Per Job:                  _______0
  Data Copy Function:          COPY           Set MOVE Options:    NO_

  Output File Stacking:        STACK__        Set STACK Options:   NO_
  Output File Cataloging:      ASIS_______
  Output File Reblocking:      NONE____  Edit: _
  Output File Encryption:      ASIS____  Edit: _

  Conversion Job Triggering:   NO_            Set TRIGR Options:   NO_
  Use Advanced Recall Interface: NO_

  Conversion Job Jobcard JCL:
         //OT05C??? JOB
(ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,____________________
         //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M_______________
         //*CANDIDATE CONVERSION
JOB_______________________________________________
         //
*_____________________________________________________________________
  Notify Userids:  _______ _______ _______ _______ _______ _______ _______

  ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

Note The fields on the panel above are discussed on the next few pages of this chapter.

Conversion Job Parameters Fields & Defaults

The following fields appear on the Conversion Job Parameters panel. The values the user enters into the fields on this panel will override the values of the parameters that are listed in DEFAULTS and USERSETS members of the PARMLIB.

Save Conversion Job JCL to DSN=_____

Parameter: CONVERSION-JCL-TARGET-DATASET-NAME

Default Value: N/A

Options: This field allows the user to specify the name of a dataset to which they would like to save the Conversion JCL generated by Candidate Selection job. The dataset name must be fully qualified but without enclosing quotes. The dataset specified will be created as either PS or PDS depending on the setting of the DSN Type field (below).

Warning If the dataset name specified in this field is pre-existing, please be advised that Tape/Copy will delete the dataset and redefine it (even if no candidates are selected for conversion).

DSN Type : ___ (PDS/PS)

Parameter: BUILD-CONVERSION-JCL-AS

Default Value: PDS

Options: This field allows the user to specify whether the Conversion JCL dataset defined above should be created as a PDS (partitioned) dataset or as a PS (physically sequential) dataset.

Auto Submit JCL: ___

Parameter: AUTO-SUBMIT

Default Value: NO

Options: This field allows the user to specify whether or not Tape/Copy should automatically submit the generated Conversion jobs to the internal reader upon completion of the Candidate Selection job. YES will cause the Candidate Selection process to submit the Conversion jobs. NO will tell the Candidate Selection process not to submit the Conversion jobs.

Input Tapes per job: ___

Parameter: TAPES-PER-CONVERSION-JOB

Default Value: 200

Options: This field allows the user to control the number of input tapes each Conversion job will process. Valid values are 1-65535. No more volume sets will be added to a conversion job after this limit is met or exceeded.

The number of actual tapes converted per job may vary from one Conversion job to the next because if a multi-volume dataset is selected that is on more volumes than the user has specified as the limit in this field, the dataset will still be converted regardless of this setting since the entire dataset gets converted in one job.

Files per job: ___

Parameter: FILES-PER-CONVERSION-JOB

Default Value: 9999

Options: This field allows the user to control the number of input datasets each Conversion job will process. Valid values are 1-65535.

The number of actual files converted per job may vary from one Conversion job to the next because if a volume set contains more files than the user has specified as the limit in this field, the volume set will still be converted regardless of this setting since the entire volume set gets converted in one job.

MB Per Conv Job: ___

Parameter: MB-PER-CONVERSION-JOB

Default Value: 0

Options: This field provides the ability to limit the amount of data in megabytes that is converted by each conversion job. If 0 is specified, no MB per job limit is set. A number from 1-9999999 can be used to set the limit to that number of MBs per job.

Data Copy Function: MOVE

Parameter: DATA-COPY-FUNCTION

Default Value: MOVE

Options: This field allows the user to specify whether they would like Tape/Copy to MOVE or COPY the input datasets to the output media.

MOVE tells Tape/Copy to copy the data (and the input tape's characteristics) to the output media and then uncatalog the input tape and set it to expire.

The Moved Volume Set Options panel discussed on the next page provides further options for datasets that will be created by a Tape/Copy MOVE conversion job.

COPY tells Tape/Copy to copy the data to the output media but not expire the input tape or perform other "move" actions.

Set MOVE Options: ___

Parameter: N/A

Default Value: NO

Options: This field is used to display the Moved Volume Set Options pop-up panel. Entering **YES** in this field will bring up the Moved Volume Set Options panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, but Tape/Copy will use the parameter settings that were last saved. (This panel is also displayed if the Data Copy Function is changed to COPY and then back to MOVE.)

Moved Volume Set Options

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
----------------  Moved Volume Set Options  ---------------
COMMAND ===>

---------------------  Input Volumes  ---------------------

Retention Period:              _________1
Location/Outcode:              NONE____
Update Creating Stepname:      YES
Creating Stepname Value:       OPENTECH

--------------------  Output Volumes  --------------------

Location/Outcode:              SAME____

ENTER to continue, PF3 to exit.
```

Input Volumes

Retention Period: ___

Parameter: MOVED-DATASET-RETENTION-PERIOD

Default Value: 30

Options: This field allows the user to control when the input tape of a MOVE conversion function should be flagged for scratch. The format is a number of days (to be added to the current date), a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) for setting an expiration date.

Location/Outcode:

Parameter: MOVED-INPUT-TAPE-OUTCODE

Default Value: NONE

Options: This field is used to tell Tape/Copy how/if to populate the OUTCODE field of the input dataset's tape management system record after the dataset has been moved (not copied) by Tape/Copy.

The user can specify **NONE**, **SAME**, or a 2-8 byte alphanumeric value to be used as the input tape outcode after the conversion.

See the MOVED-INPUT-TAPE-OUTCODE parameter description in the "Parameter Reference Guide" **for details on the options for this parameter.**

Update Creating Stepname: ____

Parameter: MODIFY-INPUT-CREATING-STEPNAME

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should populate the creating stepname field of the input dataset in the tape management database entry with the value of the next panel field (Creating Stepname Value).

If **NO** is specified for this field, Tape/Copy will not modify the creating stepname of the input dataset.

If **YES** is specified for this field, Tape/Copy will replace the creating stepname field on the input datasets with the value of the Creating Stepname Value field as part of the MOVE conversion.

This is useful for marking tapes in the tape management system as being moved by Tape/Copy so that they are not selected again for movement in other Candidate Selection jobs.

Creating Stepname Value: _____

Parameter: INPUT-CREATING-STEPNAME-VALUE

Default Value: OPENTECH

Options: This field allows the user to specify the value Tape/Copy should put into the creating stepname field of the input tape's tape management database record. This field accepts any character string up to 8 characters in length.

Output Volumes

Location/Outcode:

Parameter: OUTPUT-TAPE-OUTCODE

Default Value: NONE

Options: This field allows the user specify how Tape/Copy should populate the OUTCODE field of the output dataset's tape management system record after the dataset has been converted by Tape/Copy. The valid settings for this field are listed below.

A 2-8 byte alphanumeric value (to be used as the output tape's OUTCODE)

SAME

NONE

See the OUTPUT-TAPE-OUTCODE parameter description in the "Parameter Reference Guide" **for details on the options for this parameter.**

Output File Stacking: ___

Parameter: OUTPUT-FILE-FORMAT

Default Value: ASIS

Options: This field allows the user to specify whether the input datasets should be stacked when written to the output tape (**STACK**), whether stacked input datasets should be separated onto their own tapes when written to the output tapes (**UNSTACK**) or if Tape/Copy should leave the output tapes in the same format (stacked or separate) that they where in as input tapes (**ASIS**).

Set STACK Options: ___

Parameter: N/A

Default Value: NO

Options: This field is used to display the Stacked Output Options pop-up panel. Entering **YES** in this field will bring up the Stacked Output Options panel; entering **NO** (the default) will tell Tape/Copy not to display the panel, but Tape/Copy will use the parameter settings that were last saved when the panel was last edited.

Stacked Output Options Panel

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
-----------------  Stacked Output Options  ----------------
COMMAND ===>


Candidate Sort Field:     NONE_ None,Crtdt,Expdt,Cxpdt,DSN

Stack Control DSN Prefix: NONE_____________

Output Tape Limit:        NONE
   Minimum Percent Used:  _0
   Percent Used Cutoff:   99

Co-Location Table:        NONE____   Edit: _
Stacking-Group-Name:      NONE____

ENTER to continue, PF3 to exit.
```

Candidate Sort Field: ___

Parameter: STACKED-OUTPUT-SORT-FIELD

Default Value: NONE

Options: This field allows the user to sort the candidate volume sets by:

CRTDT - by descending creation date

EXPDT - by descending expiration date

CXPDT - by descending calculated expiration date (if any, otherwise it uses the actual expiration date)

DSN - by ascending dataset name

NONE - do not sort the candidate datasets at all

Stack Control DSN Prefix: ___

Parameter: CNV-JOB-STACK-CNTL-FILE-PREFIX

Default Value: NONE

Options: This field is provided for the user to specify the prefix of a Stack Management Control file that Tape/Copy would put as the first file on the stacked output tape. The Stack Management Control File can be used to control the expiration of a stacked tape by placing a permanent retention dataset as the first file on the tape. A valid dataset name prefix (up to 17 bytes in length) may be specified.

Output Tape Limit: ___

Parameter: STACKED-OUTPUT-VOLUME-LIMIT

Default Value: NONE

Options: This field allows the user to specify the maximum number of output volumes each Conversion job should generate. The user can specify a numeric value 1-999, or if **NONE** is specified, there will be no output tape volume limit.

Minimum Percent Used: ___

Parameter: STACKED-OUTPUT-MINIMUM-UTILIZATION

Default Value: 0

Options: This field allows the user to prevent high-capacity tapes from being under-utilized by requiring that the generated Conversion jobs all have enough input data in them to fill the selected output volume full to at least the percentage specified in this field. A percentage of 0-99 is accepted in this field.

Note The Output Tape Limit field must be set to a value other than NONE in order for this value to be used.

Percent Used Cutoff: ___

Parameter: STACKED-OUTPUT-CUTOFF-UTILIZATION

Default Value: 99

Options: This field allows the user to control how much data is moved per Conversion job. As datasets are being added to each Conversion job, the total size of the data in that job is accumulated. When an input tape volume set causes the total size of data to reach or exceed this percentage of volume capacity, multiplied by the value of the Tape Limit field, the Conversion job is “closed off” (no more volumes are added to that Conversion job) and a new Conversion job is started. Valid values are 1-99.

Note The Output Tape Limit field must be set to a value other than NONE in order for this value to be used.

Co-Location Table: _____ **Edit:** _

Parameter: ACTIVE-CO-LOCATION-TABLE

Default Value: N/A

Options: These fields are used to identify an optional Co-Location table to be used in determining which datasets are to be put into Conversion jobs together (i.e. - so that they can be stacked together on the output tape). The first field is for the name of the Tape/Copy PARMLIB member that contains the rules for Co-Location of the tape datasets (such as COLOCTBL). If no Co-Location table is to be used, **NONE** should be specified in this field.

An **E** in the Edit field allows the user to create a Co-Location table or edit a pre-existing Co-Location table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

Note For more information on using Co-Location, see Chapter 21.

Output File Cataloging: _____

Parameter: OUTPUT-DATASET-CATALOGING

Default Value: ASIS

Options: This field is used to tell Tape/Copy how to designate the catalog status of the output tape.

ASIS tells Tape/Copy to catalog the output tape if the original dataset was cataloged, and leave the output tape uncataloged if the original dataset is uncataloged.

CATALOG forces the output tape dataset to be cataloged regardless of the catalog status of the input tape.

UNCATALOG leaves the output tape dataset in uncataloged status regardless of the catalog status of the original dataset.

Output File Reblocking: _____ **Edit:**__

Parameter: OUTPUT-FILE-REBLOCKING

Default Value: NONE

Options: This field is used to tell Tape/Copy whether or not to reblock the output file resulting from the conversion, and if so, how to determine what the new blocksize should be.

OPTIMUM - Reblocking is to be attempted using the calculated OPTIMUM blocksize for the output device.

nnnnnn - A numeric value that represents an acceptable block size value for the output device.

>*member* - A Tape/Copy PARMLIB member name of a member containing user defined "rules" to permit Tape/Copy to determine if and/or how to re-block datasets.

NONE - No re-blocking is performed.

An **E** in the Edit field allows the user to create a Reblocking Table or edit a pre-existing Reblocking table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

Note See Chapter 16 for more information on reblocking output files during conversion.

Output File Encryption: _____ **Edit:**__

Parameter: OUTPUT-FILE-ENCRYPTION

Default Value: ASIS

Options: This field is used to tell Tape/Copy whether to encrypt, decrypt, or copy the data without encryption or decryption.

>*member* - A Tape/Copy PARMLIB member name of a member containing user defined "rules" to permit Tape/Copy to determine if and/or how to encrypt datasets.

DECRYPT - All CopyCrypt encrypted files will be decrypted.

ASIS - No encryption or decryption will be performed.

An **E** in the Edit field allows the user to create an Encryption Rules Table or edit a pre-existing Encryption Rules Table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

Note Encryption is only available to users licensed to use the CopyCrypt product option. See the CopyCrypt User Guide for more information on CopyCrypt.

Conversion Job Triggering: ___

Parameter: CNV-JOB-TRIGR-FUNCTIONS

Default Value: NO

Options: This field allows the user to specify whether or not the Conversion Job Triggering feature should be used. **YES** will indicate that the user wishes to use Conversion Job Triggering; **NO** indicates that Conversion Job Triggering will not be used.

If this field is set to **YES**, the user can specify the Conversion Job Triggering options using the Conversion Job Trigger Function Setup panel, discussed below.

Note See Chapter 14 for more information on the Conversion Job Triggering feature.

Set TRIGR Options: ___

Parameter: N/A

Default Value: NO

Options: This field is used to display the Conversion Job Triggering Function Setup pop-up panel. This field will only cause the panel to be displayed if the Conversion Job Triggering field is set to YES. Entering **YES** in this field will bring up the Conversion Job Trigger Function Setup panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, but Tape/Copy will use the parameter settings that were last saved.

Conversion Job Trigger Function Setup Panel

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
---------  Conversion Job Trigger Function Setup  ---------
COMMAND ===>

Control Dataset: NONE_____________________________________
        Members: Max Count= 1000  Allow Wrap= NO_

Trigger Action:  NONE_____

  CREATEDSN DSN= NONE_____________________________________

  ISSUEWTO  DSN= NONE_____________________________________
         Member= NONE____   Edit: _

  SUBMITJOB DSN= NONE_____________________________________
         Member= NONE____   Edit: _

ENTER to continue, PF3 to exit.
```

Control Dataset: _____

Members: Max Count= ____ Allow Wrap=____

Parameter: CNV-JOB-TRIGR-CTRL-DSN
CNV-JOB-TRIGR-MAXIMUM-MEMBER-COUNT
CNV-JOB-TRIGR-MEMBER-WRAP

Default Value: NONE
1000, NO

Options: These fields are used to specify information about the Job Triggering control dataset.

If **NONE** is specified in the Control Dataset field, Tape/Copy will assign a dataset consisting of the value of the DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX parameter value, plus the suffix 'TCCONV.CONTROL'. If the user wishes to specify a different dataset to be used as the control dataset, **the dataset identified must be a PDSE with an LRECL of 80 and have a RECFM of FB (fixed block) or F (fixed).**

The Max Count field accepts a numeric value 1-522236 (number of members allowed in the control dataset).

If Allow Wrap is set to **YES**, Tape/Copy will overlay members in the control dataset when the Max Count specified is reached. If Allow Wrap is set to **NO**, Tape/Copy will terminate when the Max Count specified is reached.

Trigger Action: ___

Parameter: CNV-JOB-TRIGR-ACTIONS

Default Value: NONE

Options: This field allows the user to specify what actions are to be taken when all jobs which make up the conversion job set created by this Candidate Selection process have completed. The valid values are:

CREATEDSN - Cause the conversion job to create a dataset (name specified by the user) when all jobs related to the current conversion operation have completed.

ISSUEWTO - Cause the conversion job to issue a WTO to the MVS console. The text of the WTO message is user specified (see Chapter 14).

SUBMITJOB - Cause the conversion job to submit a job from a user specified dataset/member into the MVS Internal Reader.

Note Each of the above selections require the associated fields on the Conversion Job Trigger Function Setup panel be completed.

CREATEDSN DSN= _____

Parameter: CNV-JOB-TRIGR-CREATE-DSN

Default Value: NONE

Options: This field identifies the dataset name to be created when all conversion jobs in the conversion job set created by this Candidate Selection job have completed.

The Trigger Action field must be set to CREATEDSN in order for this value to be used. If the Trigger Action field is set to any other value, the CREATEDSN DSN field should be set to NONE.

If the dataset name specified in this field already exists when Tape/Copy attempts to create it, a U0100 abend will occur. A process should be implemented by the user that will delete this trigger dataset after it has been used by the scheduling package so that it does not exist the next time Tape/Copy tries to create it.

ISSUEWTO DSN= _____
Member= _____ Edit: _

Parameter: CNV-JOB-TRIGR-WTO-DSN
CNV-JOB-TRIGR-WTO-MEMBER

Default Value: NONE
NONE

Options: These fields identify the dataset name (and member name, if applicable) which contains the text to be issued as a WTO when all conversion jobs in the conversion job set created by this Candidate Selection job have completed. If the dataset identified by the ISSUEWTO DSN field is a PDS, the Member field must also be set to tell Tape/Copy which member in that dataset contains the text Tape/Copy should issue as a WTO upon completion of the conversion job set.

An **E** in the Edit field allows the user to create a dataset/member or edit a pre-existing dataset/member using ISPF edit mode. A **B** in the Edit field brings up the specified dataset/member in browse mode.

The Trigger Action field must be set to ISSUEWTO in order for this value to be used. If the Trigger Action field is set to any other value, the ISSUEWTO DSN field should be set to NONE. See Chapter 14.

SUBMITJOB DSN= _____
Member= _____ **Edit:** _

Parameter: CNV-JOB-TRIGR-SUBMIT-DSN
CNV-JOB-TRIGR-SUBMIT-MEMBER

Default Value: NONE
NONE

Options: These fields identify the dataset name (and member name, if applicable) which contains the job Tape/Copy should submit when all conversion jobs in the conversion job set created by this Candidate Selection job have completed. If the dataset identified by the SUBMITJOB DSN field is a PDS, the Member field must also be set to tell Tape/Copy which member in that dataset contains the job Tape/Copy should submit upon completion of the conversion job set.

An **E** in the Edit field allows the user to create a dataset/member or edit a pre-existing dataset/member using ISPF edit mode. A **B** in the Edit field brings up the specified dataset/member in browse mode.

The Trigger Action field must be set to SUBMITJOB in order for this value to be used. If the Trigger Action field is set to any other value, the SUBMITJOB DSN field should be set to NONE.

Use Advanced Recall Interface: NO_

Parameter: USE-ADVR-INTERFACE

Default Value: NO

Options: This field determines whether or not the conversion job should create a Advanced Recall Candidate file to pass to the Advanced Recall product so that Advanced Recall can recall any virtual tape volumes needed by the conversion job that are not already in virtual tape cache. This will reduce virtual tape recall delays for the conversion job. If set to YES, the Tape/Copy / Advanced Recall interface will be used. If set to NO, the interface will not be used.

In order for this field to be available, the ADVR-ROUTING-FILE-NAME parameter must be set to a value other than NONE in the USERSETS member of the Tape/Copy PARMLIB. If the ADVR-ROUTING-FILE-NAME parameter is set to NONE (the default), the "Use Advanced Recall Interface:" field will be set to NO and the field will not be available for updates until the ADVR-ROUTING-FILE-NAME parameter is added to and updated in USERSETS with a valid routing file name.

Note See Chapter 12 for more information about the Advanced Recall Interface. The Advanced Recall Interface is available only to users that have licensed authority to use the Advanced Recall product.

Conversion Job Jobcard JCL:

Parameter: CONVERSION-JOB-NAME

Default Value: N/A

Options: A standard JCL job statement with a valid job name and accounting information for your data center is required. A sample JOB statement will appear as the first time default. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Conversion job unless changed here by the user.

Notify Userids: _____ _____ _____ _____ _____ _____

Parameter: NOTIFY-USERID

Default Value: N/A

Options: These fields allow the user to control the assignment of multiple user ids for notification purposes of the Candidate Selection and Conversion jobs. The notifies are internally issued TSO SENDs for all user ids listed as the 2nd through 7th user ids. The 1st user id is placed in the NOTIFY parameter of all of the generated JCL.

28 Copy On Demand Panel Option

TOPICS COVERED IN THIS CHAPTER

Copy on Demand Panel (page 28-2)

Introduction

The Copy on Demand option is selection number 2 (two) on the Tape/Copy Primary Selection Panel. This option is used to copy or move a single tape (or small predefined list of tapes). Copy on Demand does not use the typical Candidate Selection process so it allows the user to target a specific volume without meeting a list of other requirements.

The Copy on Demand option contains a single ISPF panel that is completed by the user. The user enters the required information on the panel and hits ENTER to submit the Copy on Demand job to the internal reader.

One job is submitted to perform the Copy on Demand Process.

- The job submitted verifies that the requested volume(s) exist in the tape management system database and then performs the actual conversion processing. This is a major change from previous releases of the TapeCopy Copy on Demand processing.

Note The Copy on Demand panel cannot be used for stacking. Using this panel, datasets can only be copied/moved “as is” (in the same stacked or single file format), unstacked or extracted from an already stacked tape.

Copy on Demand Panel

The Copy on Demand panel is used to identify a specific tape, or list or tapes that the user wishes to process. It also allows the user to specify the characteristics of the output tape that is created.

Example

```
   ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
    ------------------------------  Copy On Demand  --------------------------

    OPTION ===>
       C - Copy tape (Maintain original)  M - Move tape (Expire original)

    Specify Input Tape Dataset:
      Volser:                          ______
      Dataset Name:                  ____________________________________________
      File Sequence Number:            ___0
      Mass Copy Volume File DSN:       ____________________________________________
      Conversion Engine:              EXCP____

    Input Dataset Options:
      Media Type:                     DYNAMIC_
      Label Format:                   SL_
      Moved Dataset Retention Period: ________30

    Output Dataset Options:
      Media Type:                    ASIS____      Dynamic: YES
      Compression:                    ASIS__
      Label Format:                   SL_
      Cataloging Option:              ASIS_______
      Output File Format:             ASIS____

    RACF Authorization Checking:      NO________

    CopyCrypt Option:
         ASIS_____________________________________________________________

    Conversion Jobcard JCL:
           //OTTCCOD  JOB (ACCT1,ACCT2),'PROG.NAME',
YPRUN=HOLD,____________________
           //
CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=0M_______________
           //*COPY ON DEMAND
JOB_____________________________________________________
           //
*_____________________________________________________________________

     ENTER to submit or PF3 to exit
```

Note Typing “DEFAULT” on the command line will populate all ISPF fields with the system default parameter values specified in the Tape/Copy PARMLIB library.

Note This panel has two pages. Use PF8 to scroll down to the bottom of the page.

Copy on Demand Fields & Defaults

The following parameters appear on the Copy on Demand panel and are listed in the order they appear on this panel. The values you enter into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

OPTION ===>

Parameter: DATA-COPY-FUNCTION

Default Value: N/A

Options: The option command line is provided for the user to specify whether they would like Tape/Copy to **move (M)** or **copy (C)** the input datasets to the output media.

M (move) tells Tape/Copy to copy the data (and the input tape's characteristics) to the output media and then uncatalog the input tape and set it to expire (based on the setting of the Moved Dataset Retention Period field).

C (copy) tells Tape/Copy to copy the data to the output media but retain the input tape intact. The input tape is not flagged for scratch.

```
Specify Input Tape Dataset:
  Volser________
  Dataset Name:____________________________
  File Sequence Number: ____
```

Parameter: N/A

Default Value: N/A

Options: These fields allow the user to specify the tape volume serial number and/or dataset name to be copied/moved. If only the dataset name is entered, the system catalog is queried for the volume serial number and file sequence number, so if the dataset is uncataloged the volser and file sequence number must also be specified.

The File Sequence Number field accepts any numeric value 0-9999. If a File Sequence Number of 1 through 9999 is entered, only the file corresponding with the specified file sequence number will be copied. If File Sequence Number: 0 (zero) is specified, all of the files on the tape are copied.

Mass Copy Volume File DSN: _____

Parameter: N/A

Default Value: N/A

Options: The Copy on Demand panel is designed to copy/move a single dataset/tape volume as specified. However, the Mass Copy Volume File DSN field is provided to give users the capability to process a list of volumes if the volsers are known.

The user creates an 80-byte record file (prior to hitting ENTER on the Copy on Demand panel) and puts the file name in this field. The file must adhere to the following:

Must be a fixed or fixed block dataset (RECFM=F or RECFM=FB, and LRECL=80).

One 6-character tape volume serial number can be listed per line in the Mass Copy Volume File dataset.

If the Mass Copy Volume file DSN is being used with the Output File Format set to EXTRACT, the 6-character tape volume serial number AND the file sequence number must be listed (with a space in between the two, such as “vvvvvv fffff”).

An * in the first column of the record indicates a comment.

Only one volser needs to be specified if the tape is multi-volume, as Tape/Copy will acquire the full volser chain from the tape management system.

There is no limit to the number of tape volsers you can enter.

Alternatively, you can specify a cataloged DSN as the first field in the control card. The code will translate the DSN to the tape volser that is recorded in the ICF catalog for that DSN value and continue processing as if the volser had been specified. If EXTRACT processing was specified, the file sequence that is recorded in the ICF catalog will be used as the file sequence to be extracted.

Conversion Engine: _____

Parameter: DATA-CONVERSION-ENGINE

Default Value: EXCP

Options: The CONVERSION ENGINE specifies which of the TapeCopy supported conversion engines will be used to perform the conversions. Valid values are: EXCP, FDRTCOPY (for FDR tapes), or SARTCP (for SAR tapes).

Input Dataset Options:

Label Format: _____

Media Type: _____

Parameter: N/A

Default Value: Label Format defaults to: SL

Media Type has no default value

Options: The Label Format may be specified as: SL, NL or UL

The Input Media Type may be specified as any value in the IOCNTLBL or the word DYNAMIC. Specifying Dynamic causes the TapeCopy Copy on Demand to dynamically allocate the device assigned to ddname: TAPEIN in the batch job submitted to the device type on which the input dataset currently exists.

Note If Input Media Type is specified as DYNAMIC then OUTPUT MEDIA TYPE may not be specified as ASIS.

Input Dataset Options:

Moved Dataset Retention Period: _____

Parameter: MOVED-DATASET-RETENTION-PERIOD

Default Value: 30

Options: This field allows the user to control when the input tape of a MOVE conversion function should be flagged for scratch. The format is a number of days (to be added to the current date), a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) for setting an expiration date.

The value of this field is only used when the Data Copy Function is MOVE.

Warning TLMS users: This field value will not control the expiration of the input dataset. Tape/Copy will expire moved datasets based on the setting of the MOVED-DATASET-RETENTION-PERIOD parameter in the TLMSSTEP. See Chapter 3 of the Tape/Copy Installation Guide for more information on how Tape/Copy expires datasets when using TLMS.

Output Dataset Options:

Media Type: _____ Dynamic: ___

Parameter: OUTPUT-MEDIA-TYPE

Default Value: ASIS

Options: This field allows users to target a specific type of output tape media. The valid media type values for this field are in the Media Name column in the IOCNTLTB member of the Tape/Copy PARMLIB which is configured during product installation.

ASIS will cause Tape/Copy to use the same output media type that the input tape is on.

DYNAMIC can be specified as YES or NO. If YES is specified, the TAPEOUT DD will be dynamically allocated after the job is submitted using settings based on the Output Media Type specification

Note If Output Media Type is set to ASIS and Input Media Type is set to DYNAMIC, then the DYNAMIC setting must be set to YES.

Compression: _____

Parameter: OUTPUT-COMPRESSION-FORMAT

Default Value: ASIS

Options: This field allows the user to specify the compression status desired for the output tape.

COMP can be used to tell Tape/Copy that the output tapes created should be compressed.

NOCOMP can be used to tell Tape/Copy that the output tapes created should be uncompressed.

ASIS can be used to allow candidate selection to determine the output compression format based on the compression format of the input dataset or volume.

Label Format: ____

Parameter: OUTPUT-LABEL-FORMAT

Default Value: SL

Options: These fields allow users to target a specific label type for the output tape. Tape/Copy supports the following label types as output:

SL NL NSL SUL LTM AL3 AL4

ASIS can be used as the Output Label Format to cause Tape/Copy to create output tapes with the same label type as the input tapes.

Cataloging Option: _____

Parameter: OUTPUT-DATASET-CATALOGING

Default Value: ASIS

Options: This field is used to tell Tape/Copy how to designate the catalog status of the output tape.

ASIS tells Tape/Copy to catalog the output tape if the original dataset was cataloged, and leave the output tape uncataloged if the original dataset is uncataloged.

CATALOG forces the output tape dataset to be cataloged regardless of the catalog status of the input tape.

UNCATALOG leaves the output tape dataset in uncataloged status regardless of the catalog status of the original dataset.

Output File Format: ___

Parameter: OUTPUT-FILE-FORMAT

Default Value: ASIS

Options: This field allows the user to specify the format of the output tapes. **ASIS** will leave the output tapes in the same stacked or non-stacked format as its corresponding input tape. **UNSTACK** will separate all stacked datasets onto individual tapes. **EXTRACT** is used to copy a single dataset from a tape of stacked datasets (MOVE operations are not supported when using EXTRACT).

Warning For stacked input tapes, unless EXTRACT is selected, all files on the input tape will be processed even if only one dataset name is specified.

RACF Auth Checking: _____

Parameter: RACF-AUTHORIZATION-CHECKING

Default Value: NO

Options: This field allows the users to specify whether Tape/Copy should perform RACF authorization checking on the selected candidate datasets.

If this field is set to **NO** or **NONE**, then no authorization checking is performed on the candidates.

If this field is set to **U=xxxxxxxx** (where xxxxxxxx is a valid user id) or **CURRENT** (the user id submitting the candidate selection job), Tape/Copy will check the RACF authority of the user id to verify that this user has the authority to read/write/create the datasets selected. Datasets that the user id does not have the authority to process will be rejected by candidate selection.

CopyCrypt Option: _____

Parameter: OUTPUT-FILE-ENCRYPTION

Default Value: ASIS

Options: This parameter is used to tell Tape/Copy whether to invoke CopyCrypt to encrypt or decrypt the file, or if Tape/Copy should process the file “as is” (without CopyCrypt encryption functions). Encryption/decryption functions are only available to licensed CopyCrypt users.

29 ACS Copy Panel Option

TOPICS COVERED IN THIS CHAPTER

SMS Tape ACS Candidate Selection Panel (page 29-3)
Candidate Job Parameters Panel (page 29-15)
Conversion Job Parameters Panel (page 29-23)

Introduction

The ACS Copy option is selection 3 (three) on the Tape/Copy Primary Selection Panel. This option is used to generate the job which selects multiple tapes for copying based on SMS ACS routines and flexible user-set criteria and then creates Conversion JCL for the chosen candidates.

Note For more information on the Candidate Selection process performed by the job that is generated using the ACS Copy ISPF panels, see Chapter 9.

The ACS Copy option contains three primary ISPF panels that are completed by the user, as well as a few optional "pop-up" panels that are displayed on top of the primary panels when selected by the user. The user enters the required information on each panel and hits ENTER to proceed to the next panel.

Note All three panels must be completed before the ACS Candidate Selection JCL is generated.

The panels appear in the order they are listed here (click the panel name to go to that panel's description):

- **SMS Tape ACS Candidate Selection Panel**

  This panel is used to specify the criteria by which tapes should be selected as candidates to be copied.

- **Candidate Job Parameters Panel**

  This panel is used to specify the filtering and reporting options used by the Candidate Selection process, as well as provides a field for the user to give a dataset name if they have chosen to save the generated Candidate Selection JCL.

- **Conversion Job Parameters Panel**

  This panel is used to specify the options the user wishes Tape/Copy to use when creating Conversion JCL for the tapes selected by the Candidate Selection process, as well as the options to be used by the Conversion process.

SMS Tape ACS Candidate Selection Panel

The SMS Tape ACS Candidate Selection panel is used to specify the criteria by which tapes should be selected as candidates to be copied. Any combination of the listed criteria may be used.

Example

```
----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
----------------------  SMS Tape ACS Candidate Selection  -------------------
COMMAND ===>

Stacked File Qualification:   FIRST             ACS Selection Table: ACSTABLE
(Process volume set if 1st file selected)                     Edit: _

Dataset Size:    Min ___0 B         Max _100 G       Select on: GDG DSNs: YES_
Expiration Date: Min ________30      Max _____99999        Multi-Volume: YES_
Create Date:     Min _________0      Max _____99999       Stacked Files: YES_
Days Idle:       Min _________3      Max _____99999       Robotic Tapes: YES_
Volser Range:  From: $_____          To: 999999           Virtual Tapes: NO__
Media Type:   Input: ALL_____                           Uncataloged DSNs: NO__
Label Format: Input: ALL        Output: ASIS             Expiration Type: NO__
Compression:  Input: ALL___     Output: COMP__            Volume Age/Use: NO__

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____     _   ____________________________________________________
  _    ____     _   ____________________________________________________
  _    ____     _   ____________________________________________________
  _    ____     _   ____________________________________________________

ENTER to continue, PF3 to exit.
```

Note Typing “DEFAULT” on the command line will populate all ISPF fields with the system default commands specified in the Tape/Copy PARMLIB library.

Note The fields on the panel above are discussed on the next few pages of this chapter.

SMS Tape ACS Candidate Selection Fields & Defaults

The following fields appear on the SMS Tape ACS Candidate Selection panel. The values the user enters into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Stacked File Qualification: _____

Parameter: STACKED-FILE-QUALIFICATION

Default Value: FIRST

Options: This field allows the user to select stacked volume sets based on whether one or more of the files on the stacked volset meet the candidate selection criteria set by the user, or to select individual files from a stacked tape based on meeting the selection criteria separately. The valid values for this field are:

FIRST - Process the volume set if the first file in the stack is selected (most efficient option, as fewer selection tests are performed.)

ALL - Process the volume set if all of the files in the stack are selected

ANY - Process the volume set if any of the files in the stack are selected

EACH - Process only the files in the volume set that match the selection criteria

Warning When using Stacked File Qualification: EACH with Data Copy Function: MOVE (on the Conversion Job Parameters panel), all files in the input multi-file volume set will be expired at the completion of the conversion job. The user must make sure that the files that they are not selecting for conversion from the input tape do not contain valid data that should not be scratched.

Active ACS Selection Table: _____
Edit: ___

Parameter: ACTIVE-ACS-SELECTION-TABLE

Default Value: ACSTABLE

Options: These fields are used to identify the ACS selection table to be used in selecting candidates for conversion. The first field is for the name of the Tape/Copy PARMLIB member that contains the rules for selection of the tape datasets (such as ACSTABLE).

An **E** in the Edit field allows the user to create an ACS selection table or edit a pre-existing ACS selection table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

```
Dataset Size:  Min _____ _ Max ______ _
  or
Volset  Size:  Min _____ _ Max ______ _
```

Parameter:

MINIMUM-DATASET-SIZE

MAXIMUM-DATASET-SIZE

USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE

Default Value:

0 B

100 G

Options:

These fields can be used to specify either the minimum and maximum dataset size OR the minimum and maximum volume set size for selection. Simply type over the word “Dataset” with the word “Volset” directly on the Candidate Selection panel to use the volume set size as criteria instead of the dataset size. When set to “Volset”, the USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE parameter is automatically set to YES.

When set to *“Dataset”* (default), these fields allow the user to select tape datasets within the specified size range. The first part of the fields will accept numeric values with decimal entries to the hundredths (i.e. 2.35 G or 70.5 M are valid entries). The second part of the field is a unit designator that will accept the following one character values:

B for Bytes

K for Kilobytes

T for Terabytes

M for Megabytes

G for Gigabytes

When set to “***Volset***”, these fields allow the user to select tape volume sets within the specified size range. The first part of the fields will accept numeric values with decimal entries to the hundredths (i.e. 2.35 G or 70.5 M are valid entries). The second part of the field is a unit designator that will accept the following one character values:

B for Bytes

K for Kilobytes

T for Terabytes

M for Megabytes

G for Gigabytes

% - This setting causes Tape/Copy to compute the volume set’s percentage utilized and compare that percentage to the numeric value listed for this parameter. Any volsets less utilized than the percentage listed in the Volset Size: Min field, or more utilized more than the percentage listed in the Volset Size: Max field, will be rejected from processing.

```
Expiration Date:  Min ______  Max ______
```

Parameter: MINIMUM-DAYS-UNTIL-EXPIRATION
MAXIMUM-DAYS-UNTIL-EXPIRATION

Default Value: 30
999999

Options: These fields allow the user to select only tape datasets that are set to expire between the minimum and maximum dates entered. These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Create Date: Min _____ Max _____

Parameter: MINIMUM-DAYS-SINCE-CREATION
MAXIMUM-DAYS-SINCE-CREATION

Default Value: 0
99999

Options: These fields allow the user to select only tape datasets that were created between the minimum and maximum dates entered. (The value you specify in the Min. field will tell Tape/Copy not to select anything created after that date. The value you specify in the Max. field will tell Tape/Copy not to select anything created before that date.) These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Days Idle: Min _____ Max _____

Parameter: DAYS-IDLE
MAXIMUM-DAYS-IDLE

Default Value: 3
99999

Options: These fields allow the user to select only datasets that have been used during the range of days or dates specified. These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Volser Range: From: _____ To: _____

Parameter: INPUT-TAPE-STARTING-VOLSER
INPUT-TAPE-ENDING-VOLSER

Default Value: $
999999

Options: These fields allow users to target a specific range of volume serial numbers in the tape library. Only the volsers within the specified range will be used to find candidates. If multiple volser ranges are required, a volume inclusion list needs to be defined and targeted by the "Edit/Sel Pattern Type Incl/Excl Dataset" fields at the bottom of this panel.

For multi-volume datasets, if any of the tape volume serial numbers fall within the selected range, the dataset will be selected.

Media Type: Input: _____

Parameter: INPUT-MEDIA-TYPE

Default Value: ALL

Options: This field allow users to specify which tape media should be targeted as input (the output media type is not specified, as it is determined by the ACS rules defined by the user in the ACS selection table). The valid media type values for these fields are in the Media Name column in the IOCNTLTB member of the Tape/Copy PARMLIB. The Candidate Selection job will only include tapes with the Input Media Type selected unless **ALL** is specified.

ALL can be used as the Input Media Type only and will cause Tape/Copy to select from all of the media types defined as input media types in the IOCNTLTB member.

Label Format: Input :____ Output: ____

Parameter: INPUT-LABEL-FORMAT

OUTPUT-LABEL-FORMAT

Default Value: ALL

ASIS

Options: These fields allow users to target a specific label type for both input and output processes. The Candidate Selection job will only include tapes with the Input Label Format selected unless **ALL** is specified.

Tape/Copy supports the following label types as input:

SL NL NSL SUL LTM AL1 AU1 AL3 AU3

and the following label types are supported for output:

SL NL NSL SUL LTM AL3 AL4

ALL can be used as the Input Label Format only and will cause Tape/Copy to select from all valid label formats.

ASIS can be used as the Output Label Format only and will cause Tape/Copy to create output tapes with the same label type as the input tapes.

Compression: Input:_____ Output: _____

Parameter: INPUT-COMPRESSION-FORMAT
OUTPUT-COMPRESSION-FORMAT

Default Value: ALL
COMP

Options: These fields allow users to target a specific compression status for both input and output processes. The Candidate Selection job will only include tapes with the Input Compression status selected unless **ALL** is specified.

COMP can be used in the input field to select only compressed tapes; or in the output field to tell Tape/Copy that the output tapes created should be compressed.

NOCOMP can be used in the input field to select only uncompressed tapes; or in the output field to tell Tape/Copy that the output tapes created should be uncompressed.

ALL can be used as the Input Compression status only and will cause Tape/Copy to select from both compressed and uncompressed tapes.

ASIS can be used as the Output Compression status only and will allow candidate selection to determine the output compression format based on the compression format of the input dataset or volume.

GDG DSNs: _____

Parameter: DATASET-NAME-TYPE

Default Value: YES

Options: This field allows the user to specify whether Generation Data Group (GDG) datasets should be included along with non-GDG datasets as candidates (**YES**), whether GDG datasets should be excluded from consideration (**NO**) or if only GDG datasets should be considered for selection (**ONLY**).

Multi-Volume: _____

Parameter: PROCESS-MULTI-VOLUME-DATASETS

Default Value: YES

Options: This field allows the user to specify whether multi-volume datasets should be included along with single volume dataset as candidates (**YES**), whether multi-volume datasets should be excluded from consideration (**NO**) or if only multi-volume datasets should be considered for selection (**ONLY**).

Stacked Files: ____

Parameter: PROCESS-STACKED-FILES

Default Value: YES

Options: This field allows the user to specify whether stacked file tapes should be included along with unstacked tapes as candidates (**YES**), whether stacked file tapes should be excluded from consideration (**NO**) or if only stacked file tapes should be considered for selection (**ONLY**).

Robotic Tapes: _____

Parameter: MOVE-FROM-ATL

Default Value: YES

Options: This field allows the user to specify whether robotic tape library resident tapes should be included along with non-robotic tapes as candidates (**YES**), whether robotic tape library resident tapes should be excluded from consideration (**NO**) or if only robotic tape library resident tapes should be considered for selection (**ONLY**).

Tape/Copy considers both real tapes in an automated tape library and virtual tapes in a virtual tape library as “robotic” and selectable by this parameter. To select by real or virtual, use the Virtual Tapes selection field also on this panel in conjunction with this field.

Virtual Tapes: _____

Parameter: PROCESS-VIRTUAL-VOLUMES

Default Value: NO

Options: This field allows the user to specify whether virtual tape library resident tapes should be included along with non-virtual tapes as candidates (**YES**), whether virtual tape library resident tapes should be excluded from consideration (**NO**) or if only virtual tape library resident tapes should be considered for selection (**ONLY**).

The Robotic Tapes field also on this panel must be set to YES or ONLY in order for virtual tapes to be selected.

Uncataloged DSNs: ____

Parameter: PROCESS-UNCATALOGED-DATASETS

Default Value: NO

Options: This field allows the user to specify whether uncataloged datasets should be included along with cataloged datasets as candidates (**YES**), whether uncataloged datasets should be excluded from consideration (**NO**) or if only uncataloged datasets should be considered for selection (**ONLY**).

Expiration Type: ____

Parameter: N/A

Default Value: NO

Options: This field is used to display the Expiration Type Selection pop-up panel. Entering **YES** in this field will bring up the Expiration Type Selection panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, and Tape/Copy will use the default settings found in DEFAULTS and USERSETS.

Expiration Type Selection Panel

```
------------  OpenTech TAPE/COPY SYSTEM Rx.x.x  -----------
---------------  Expiration Type Selection  ---------------
COMMAND ===>

Process CATALOG CONTROL Datasets:        YES   (99000)
Process CATALOG/DATE CONTROL Datasets:   YES
Process CYCLE CONTROL Datasets:          YES   (99CCC)
Process DATE CONTROL Datasets:           YES
Process ELAPSED DAYS Datasets:           YES
Process EXPIRATION DATE Datasets:        YES
Process FOREIGN Datasets:                YES   (98000)
Process LDATE Datasets:                  YES   (98DDD)
Process MOVE IMMEDIATE Datasets:         YES
Process PERMANENT RETENTION Datasets:    YES   (99365)
Process STATS DATE Datasets:             YES   (STATS/???)
Process USER DATE Datasets:              YES   (USER/???)

ENTER to continue, PF3 to exit.
```

Parameter: PROCESS-CATALOG-CONTROL-DATASETS
PROCESS-CATALOG/DATE-CONTROL-DATASETS
PROCESS-CYCLE-CONTROL-DATASETS
PROCESS-DATE-CONTROL-DATASETS
PROCESS-ELAPSED-DAYS-DATASETS
PROCESS-EXPIRATION-DATE-DATASETS
PROCESS-FOREIGN-DATASETS
PROCESS-LDATE-DATASETS
PROCESS-MOVE-IMMEDIATE-DATASETS
PROCESS-PERMANENT-RETENTION-DATASETS
PROCESS-STATS-DATE-DATASETS
PROCESS-USER-DATE-DATASETS

Default Value: YES

Options: The fields listed on this panel accept **YES** (process the expiration type) or **NO** (exclude datasets with the expiration type).

Volume Age/Use: _____

Parameter: N/A

Default Value: NO

Options: This field is used to display the Volume Age/Usage Selection pop-up panel. Entering **YES** in this field will bring up the Volume Age/Usage Selection panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, and Tape/Copy will use the default settings found in DEFAULTS and USERSETS.

Volume Age/Usage Selection Panel

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
---------------  Volume Age/Usage Selection  --------------
COMMAND ===>

Minimum Days Since Volume Birth Date:  _________0

Minimum Temporary I/O Errors:          _____0

Minimum Volume Use Count:              _____0


ENTER to continue, PF3 to exit.
```

Minimum Days Since Volume Birth Date: ___

Parameter: MINIMUM-DAYS-SINCE-VOLUME-BIRTH

Default Value: 0

Options: This field allows the user to select datasets by the number if days (or date) since a volume was entered into the tape management system. The field will accept a number of days, a Julian date (yyyy.ddd) or Gregorian date (mm/dd/yyyy) entry.

Minimum Temporary I/O Errors: ___

Parameter: MINIMUM-TEMPORARY-IO-ERRORS

Default Value: 0

Options: This field allows the user to select volumes which have exceeded the minimum temporary IO error value specified. The temporary IO error value is accumulated differently for each tape management system supported by Tape/Copy. (See the related MINIMUM-TEMPORARY-IO-ERRORS parameter description in the Tape/Copy "Parameter Reference Guide" for complete details on how Tape/Copy determines the temporary IO error count.) This field will accept a numeric value in the range of 0 – 99999.

Minimum Volume Use Count: ___

Parameter: MINIMUM-VOLUME-USE-COUNT

Default Value: 0

Options: This field allows the user to select volumes by the number of volume Opens since the volume was introduced into the tape management system. (See the related MINIMUM-VOLUME-USE-COUNT parameter description in the Tape/Copy "Parameter Reference Guide" for complete details on which field the tape management system uses to determine this value.) This field will accept a numeric value in the range of 0 – 99999.

Edit Pattern Incl

/Sel Type /Excl Dataset (containing the patterns)

Parameter: N/A

Default Value: N/A

Options:

Edit/Sel:

B - displays the specified dataset in ISPF browse mode

E - creates a member in a predefined dataset or edits the include/exclude pattern in the dataset specified

S - selects the include/exclude pattern dataset for processing

Pattern Type:

CJOB - dataset specified contains creating job name patterns

CPGM - dataset specified contains creating program name patterns

CSYS - dataset specified contains creating system name patterns

DSNS - dataset specified contains dataset name patterns

DSCJ - dataset specified contains dataset name/creation job name patterns

OUTC - dataset specified contains outcode patterns

TLBL - dataset specified contains tape label patterns

VOLS - dataset specified contains volume serial number patterns

Incl/Excl:

I - include only candidates matching the patterns in the dataset specified

E - exclude all candidates matching the patterns in the dataset specified

Dataset:

Dataset where the include/exclude patterns are defined (**NOT** the pattern itself)

Up to four include/exclude pattern datasets may be manipulated containing either "include only" or "exclude" patterns. These "pattern" datasets can contain specific fully qualified lists, or are allowed the use of OpenTech Systems' wildcards (see Appendix A for valid wildcards and their uses). The pattern dataset should be fixed block (RECFM=FB) and have a logical record length of 80 (LRECL=80).

Note In order for the Candidate Selection job to use the pattern dataset in processing, the user must place an S (select) in the Edit/Sel field before pressing ENTER to advance to the next panel.

All the default include/exclude Tape/Copy PARMLIB members that are shipped with the product for use with include/exclude processing are always processed during Candidate Selection, regardless of the include/exclude pattern datasets specified on this ISPF panel. These pre-defined PARMLIB members begin with "INCL" (include) or "EXCL" (exclude) - INCLDSNS and EXCLVOLS, for example. If the user specifies a pattern dataset on the Candidate Selection panel AND has patterns/values defined in the pre-defined

Tape/Copy PARMLIB members, Tape/Copy uses both. The user should take care not to define conflicting values.

Candidate Job Parameters Panel

The Candidate Job Parameters panel is used to specify the filtering and reporting options used by the Candidate Selection process, as well as provide a field for the user to give a dataset name if they have chosen to save the generated Candidate Selection JCL.

Example

```
   ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
   --------------------------  Candidate Job Parameters  -----------------------
   COMMAND ===>
   Save Candidate Job JCL to DSN= ____________________________________________
   Candidate Job Jobcard JCL:

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

  Pre-filter:                            Reports:
   Scratches:                 YES_____   Candidate Selection:         YES
   Tape Volser Range:         YES        Conversion Forecast:         YES
   Dataset Names:             NO_        Conversion Forecast Detail:  YES
   Dataset Name/Creation Job: NO_        Candidate Rejection:         YES
   RACF Auth Checking:      NO________   Candidate Rejection Summary: YES
  Generate:                              Candidate Tape Pre-Pull:     YES___
   Candidate Tape Pre-Pull WTOR: NO_     Bad Media:                   YES
   Conversion JCL:               YES     Lost Volumes:                YES
                                         Conversion Statistics:       YES___
  Candidate Job Restart DD Statement:

_____________________________________________________________________________

  ENTER to continue to next panel, PF3 to return to previous panel
```

Note The fields on the panel above are discussed on the next few pages of this chapter.

Candidate Job Parameters Fields & Defaults

The following fields appear on the Candidate Job Parameters panel. The values the user enters into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Save Candidate Job JCL to DSN=_____

Parameter: N/A

Default Value: N/A

Options: This field allows the user to specify the name of a dataset to which they would like to save the Candidate Selection job JCL. The dataset name must be fully qualified but without enclosing quotes. This feature is helpful for those who would like to save the Candidate Selection JCL and use their job scheduling package to have the JCL run at regularly scheduled intervals.

If the dataset is a preexisting PDS, the name of a member in the specified PDS should be entered along with the dataset name (ex. OT.TAPECOPY.JCL.CNTL(DCCNDSEL)). If the user wishes to create a new member within an existing PDS, they can enter the PDS name and the new member name in parenthesis and Tape/Copy will create the new member.

Warning If the member name specified already exists in the PDS, please be advised that the contents of this member will be overwritten.

If a dataset name is provided in this field, the Candidate Selection JCL will be displayed in ISPF edit mode once the user completes the next panel (the Conversion Job Parameters panel) and presses ENTER. However, if a dataset name is not provided in this field, the Candidate Selection JCL will not be saved and will not be displayed for review before the job is submitted.

Candidate Job Jobcard JCL:

Parameter: N/A

Default Value: N/A

Options: A standard JCL job card with a valid jobname and accounting information for your data center is required. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Candidate Selection job unless changed here by the user.

Pre-filter:

Scratches: _____

Parameter: PRE-EDIT-REJECTIONS

Default Value: NO

Options: This field allows the user to tell Tape/Copy if/when it should delete unused tape database entries, tapes in delete status and scratch tapes from the input file to the candidate selection program. Tape/Copy can also filter out the database entries of the datasets created before the value of the MAXIMUM-DAYS-SINCE-CREATION parameter in some cases. “Filtering” these types of unneeded database entries will improve the performance of the Candidate Selection process.

The valid values for this field are:

NO - Do not filter the input file and issue a rejection message for each scratched, deleted and unused tape database entry on the Dataset Rejection Report.

YES - Filter out unused, scratched and deleted entries during the Pre-Filter phase of data collection.

ENHANCED - Filter out the unused, scratched and deleted entries, during the Extract/Dump phase of data collection. **(CA-1 and DFSMSrmm users only.)**

CDTENH - Filter out the unused, scratched and deleted entries, as well as the datasets created before the value of the MAXIMUM-DAYS-SINCE-CREATION parameter, during the Extract/Dump phase of data collection. **(CA-1 and DFSMSrmm users only.)**

Tape Volser Range: ___

Parameter: PRE-SELECT-VOLSER-RANGE

Default Value: NO

Options: This field allows the users to specify whether or not Tape/Copy should “pre-filter” the records that fall outside of the tape volser range specified on the first panel (the Candidate Selection panel), or specified in volser inclusion or exclusion lists (INCLVOLS/EXCLVOLS).

Pre-filtering by Tape Volser Range (**YES**) will allow Tape/Copy to remove the records outside of the specified volser range from Tape/Copy’s work files earlier in the selection process so that the Candidate Selection job runs faster and does not track all of those records on its Dataset Rejection Report.

If this field is set to **NO**, Tape/Copy will track these records throughout the selection process and issue a rejection message for each of them on the Dataset Rejection Report.

Dataset Names: ___

Parameter: PRE-SELECT-DATASET-NAMES

Default Value: NO

Options: This field allows the users to specify whether or not Tape/Copy should "pre-filter" the records that do not match the dataset names that are being specifically included using the INCLDSNS and/or other dataset name inclusion list specified on the first panel (the Candidate Selection panel). Datasets that are specifically excluded (such as in the EXCLDSNS member) are also filtered.

Pre-filtering by Dataset Names (**YES**) will allow Tape/Copy to remove the records not included by dataset name from Tape/Copy's work files earlier in the selection process so that the Candidate Selection job runs faster and does not track all of those records on its Dataset Rejection Report.

If this field is set to **NO**, Tape/Copy will track these records throughout the selection process and issue a rejection message for each of them on the Dataset Rejection Report.

Dataset Name/Creation Job: ___

Parameter: PRE-SELECT-DATASET-NAME/CREATION-JOB

Default Value: NO

Options: This field allows the users to specify whether or not Tape/Copy should "pre-filter" the records that do not match the dataset names/creation job names that are being specifically included using the INCLDSCJ and/or other dataset name/creation job name inclusion list specified on the first panel (the Candidate Selection panel). Datasets that are specifically excluded (such as in the EXCLDSCJ member) are also filtered.

Pre-filtering by Dataset Name/Creation Job (**YES**) will allow Tape/Copy to remove the records not included by dataset name/creation job name from Tape/Copy's work files earlier in the selection process so that the Candidate Selection job runs faster and does not track all of those records on its Dataset Rejection Report.

If this field is set to **NO**, Tape/Copy will track these records throughout the selection process and issue a rejection message for each of them on the Dataset Rejection Report.

RACF Auth Checking: _____

Parameter: RACF-AUTHORIZATION-CHECKING

Default Value: NO

Options: This field allows the users to specify whether Tape/Copy should perform RACF authorization checking on the selected candidate datasets.

If this field is set to **NO** or **NONE**, then no authorization checking is performed on the candidates.

If this field is set to **U=xxxxxxxx** (where xxxxxxxx is a valid user id) or **CURRENT** (the user id submitting the candidate selection job), Tape/Copy will check the RACF authority of the user id to verify that this user has the authority to read/write/create the datasets selected. Datasets that the user id does not have the authority to process will be rejected by candidate selection.

Reports:

Candidate Selection: ___

Parameter: CANDIDATE-SELECTION-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Candidate Selection Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the entire Candidate Selection Report, but only print the Candidate Selection totals if datasets are selected.

Conversion Forecast: ___

Parameter: CONVERSION-FORECAST-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Conversion Forecast Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Conversion Forecast Detail: ___

Parameter: CONVERSION-FORECAST-DETAIL-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Conversion Forecast Detail Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Candidate Rejection: ___

Parameter: DATASET-REJECTION-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Dataset Rejection Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Candidate Rejection Summary: ___

Parameter: DATASET-REJECTION-SUMMARY-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Dataset Rejection Summary Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report.

Candidate Tape Pre-Pull: ___

Parameter: TAPE-PRE-PULL-REPORT

Default Value: YES

Options: This field allows the user to specify what type of Tape Pre-Pull List Reports to produce, or whether the generation of Tape Pre-Pull List Report should be bypassed.

YES - Produce the standard Tape Pre-Pull List Report

MASTER - Produce only the Master Tape Pre-Pull List Report

BOTH - Produce both the Master Tape Pre-Pull List Report and the individual Tape Pre-Pull List Reports.

NO - Do not produce any Tape Pre-Pull List Reports.

`Bad Media: ___`

Parameter: BAD-MEDIA-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Bad Media Report. **YES** will cause the report to be generated (if there are entries in BADMEDIA). **NO** will tell Tape/Copy not to produce the report.

`Lost Volumes: ___`

Parameter: LOST-VOLUMES-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Lost Tape Volumes Report. **YES** will cause the report to be generated (if there are entries in the LOSTVOLS member). **NO** will tell Tape/Copy not to produce the report.

`Conversion Statistics: ___`

Parameter: CONVERSION-STATISTICS-REPORT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce a Conversion Statistics Report. **YES** will cause the report to be generated. **NO** will tell Tape/Copy not to produce the report. **TOTALS** will cause a report of only the grand total lines of the report to be produced.

`Candidate Tape Pre-Pull WTOR: ___`

Parameter: SUPPRESS-PULLLIST-REPORT-READY-WTOR

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should alert the console operator that the Tape/Copy Tape Pre-Pull Reports are available to be printed by issuing a WTOR message (which requires a response before the job will continue and end). **YES** will cause the WTOR to be issued and the Candidate Selection job will wait for a response before ending. **NO** will cause the WTOR to be bypassed.

Conversion JCL: ___

Parameter: CONVERSION-JCL

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should produce Conversion JCL for the candidates selected. **YES** will cause the Conversion JCL to be created. **NO** will cause the creation of the JCL to be bypassed.

Candidate Job Restart DD Statement:

_____

Parameter: N/A

Default Value: N/A

Options: This field provides the user with the means to pass restart information to the Candidate Selection job by using a bypass DD statement. The user can indicate whether or not Tape/Copy should bypass a phase or use a non-default input file.

This field is to be used as a JCL DD statement, such as:

//BYPSDUMP DD DUMMY

or

//BYPSDUMP DD DSN=OT.RMM.EDGHSKP

Note See Chapter 9 for full descriptions of Tape/Copy's Candidate Selection phases and instructions on bypassing phases in Tape/Copy processing.

```
  A "?" may be entered in this field to display a pop menu from which the user
may select the desired restart dd statement.

  .-------------------------------------------------------------.
  | ------------  OpenTech Tape/Copy System Rx.x.x------------- |
  | --------------------  Restart DD Names  ------------------- |
  | COMMAND ===>                                                |
  |                                                             |
  | _ //BYPSSTAT DD DUMMY bypass statistics phase               |
  | _ //BYPSDUMP DD DUMMY bypass TMC extract phase              |
  | _ //BYPSSORT DD DUMMY bypass TMC sort phase                 |
  | _ //BYPSSUMM DD DUMMY bypass TMC summarize phase            |
  | _ //BYPSEXPD DD DUMMY bypass expiration date calc only      |
  | _ //BYPSFILT DD DUMMY bypass pre-edit & filtering phase     |
  | _ //BYPSCSEL DD DUMMY bypass entire candidate selection     |
  |                                                             |
  | Place an "S" or "/" next to the Restart DD you want to use  |
  | and Press ENTER to continue or Press PFK3 to cancel         |
  '-------------------------------------------------------------'
```

Conversion Job Parameters Panel

The Conversion Job Parameters panel allows the user to specify the output tape characteristics for Tape/Copy to use when creating Conversion JCL for the tapes selected by the Candidate Selection process.

Example

```
   ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
   -------------------------  Conversion Job Parameters  -----------------------
   COMMAND ===>
  Save Conversion JCL to DSN:  OT05.CONVJCL.CNTL____________________________
                   DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
  Input Tapes per job:        ___10          Files per job:       _9999
  MB Per Job:                 _____0
  Data Copy Function:         COPY           Set MOVE Options:    NO_

  Output File Stacking:       STACK__        Set STACK Options:   NO_
  Output File Cataloging:     ASIS_______
  Output File Reblocking:     NONE____  Edit: _
  Output File Encryption:     ASIS____  Edit: _

  Conversion Job Triggering:  NO_            Set TRIGR Options:   NO_
  Use Advanced Recall Interface: NO_

  Conversion Job Jobcard JCL:
        //OT05C??? JOB
(ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,____________________
        //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M______________
        //*CANDIDATE CONVERSION
JOB_____________________________________________
        //
*_______________________________________________________________________
  Notify Userids:  _______ _______ _______ _______ _______ _______ _______

  ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

Note The fields on the panel above are discussed on the next few pages of this chapter.

Conversion Job Parameters Fields & Defaults

The following fields appear on the Conversion Job Parameters panel. The values the user enters into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Save Conversion Job JCL to DSN=_____

Parameter: CONVERSION-JCL-TARGET-DATASET-NAME

Default Value: N/A

Options: This field allows the user to specify the name of a dataset to which they would like to save the Conversion JCL generated by Candidate Selection job. The dataset name must be fully qualified but without enclosing quotes. The dataset specified will be created as either PS or PDS depending on the setting of the DSN Type field (below).

Warning If the dataset name specified in this field is pre-existing, please be advised that Tape/Copy will delete the dataset and redefine it (even if no candidates are selected for conversion).

DSN Type : ___ (PDS/PS)

Parameter: BUILD-CONVERSION-JCL-AS

Default Value: PDS

Options: This field allows the user to specify whether the Conversion JCL dataset defined above should be created as a PDS (partitioned) dataset or as a PS (physically sequential) dataset.

Auto Submit JCL: ___

Parameter: AUTO-SUBMIT

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should automatically submit the generated Conversion jobs to the internal reader upon completion of the Candidate Selection job. YES will cause the Candidate Selection process to submit the Conversion jobs. NO will tell the Candidate Selection process not to submit the Conversion jobs.

Input Tapes per job: ___

Parameter: TAPES-PER-CONVERSION-JOB

Default Value: 200

Options: This field allows the user to control the number of input tapes each Conversion job will process. Valid values are 1-65535. No more volume sets will be added to a conversion job after this limit is met or exceeded.

The number of actual tapes converted per job may vary from one Conversion job to the next because if a multi-volume dataset is selected that is on more volumes than the user has specified as the limit in this field, the dataset will still be converted regardless of this setting since the entire dataset gets converted in one job.

Files per job: ___

Parameter: FILES-PER-CONVERSION-JOB

Default Value: 9999

Options: This field allows the user to control the number of input datasets each Conversion job will process. Valid values are 1-65535.

The number of actual files converted per job may vary from one Conversion job to the next because if a volume set contains more files than the user has specified as the limit in this field, the volume set will still be converted regardless of this setting since the entire volume set gets converted in one job.

MB Per Conv Job: ___

Parameter: MB-PER-CONVERSION-JOB

Default Value: 0

Options: This field provides the ability to limit the amount of data in megabytes that is converted by each conversion job. If 0 is specified, no MB per job limit is set. A number from 1-9999999 can be used to set the limit to that number of MBs per job.

Data Copy Function: **COPY**

Parameter: DATA-COPY-FUNCTION

Default Value: COPY

Options: This field allows the user to specify whether they would like Tape/Copy to MOVE or COPY the input datasets to the output media.

MOVE tells Tape/Copy to copy the data (and the input tape's characteristics) to the output media and then uncatalog the input tape and set it to expire.

The Moved Volume Set Options panel discussed on the next page provides further options for datasets that will be created by a Tape/Copy MOVE conversion job.

COPY tells Tape/Copy to copy the data to the output media but not expire the input tape or perform other "move" actions.

Set MOVE Options: ___

Parameter: N/A

Default Value: NO

Options: This field is used to display the Moved Volume Set Options pop-up panel. Entering **YES** in this field will bring up the Moved Volume Set Options panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, but Tape/Copy will use the parameter settings that were last saved. (This panel is also displayed if the Data Copy Function is changed to COPY and then back to MOVE.)

Moved Volume Set Options

```
 ------------  OpenTech Tape/Copy System Rx.x.x  -----------
----------------  Moved Volume Set Options  ---------------
COMMAND ===>

---------------------  Input Volumes  ---------------------

Retention Period:              _________1
RMM Expire Management Value:   TCEXPIRE
Location/Outcode:              NONE____
Update Creating Stepname:      YES
Creating Stepname Value:       OPENTECH

---------------------  Output Volumes  --------------------

Location/Outcode:              SAME____

ENTER to continue, PF3 to exit.
```

Input Volumes

Retention Period: ___

Parameter: MOVED-DATASET-RETENTION-PERIOD

Default Value: 30

Options: This field allows the user to control when the input tape of a MOVE conversion function should be flagged for scratch. The format is a number of days (to be added to the current date), a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) for setting an expiration date.

RMM Expire Management Value: ___ (DFSMSrmm users only)

Parameter: MOVE-EXPIRE-MANAGEMENTVALUE

Default Value: ASIS

Options: This field allows the user to specify what value Tape/Copy will use when updating the RMM MANAGEMENTVALUE field of the input DFSMSrmm CDS dataset record after a MOVE, to assure that the file is expired.

Specifyimg **ASIS** will leave the MANAGEMENTVALUE field in the input DFSMSrmm CDS dataset record unchanged. This is not recommended as it could cause the file (and associated tape volumes) to continue to be retained; if the file had a MANAGEMENTVALUE assigned.

If the VRS MANAGEMENTVALUE specified is defined to RMM, it should be defined to retain the datasets UNTILEXPIRED.

Location/Outcode:

Parameter: MOVED-INPUT-TAPE-OUTCODE

Default Value: NONE

Options: This field is used to tell Tape/Copy how/if to populate the OUTCODE field of the input dataset's tape management system record after the dataset has been moved (not copied) by Tape/Copy.

The user can specify **NONE**, **SAME**, or a 2-8 byte alphanumeric value to be used as the input tape outcode after the conversion.

See the MOVED-INPUT-TAPE-OUTCODE parameter description in the "Parameter Reference Guide" **for details on the options for this parameter.**

Update Creating Stepname: ____

Parameter: MODIFY-INPUT-CREATING-STEPNAME

Default Value: YES

Options: This field allows the user to specify whether or not Tape/Copy should populate the creating stepname field of the input dataset in the tape management database entry with the value of the next panel field (Creating Stepname Value).

If **NO** is specified for this field, Tape/Copy will not modify the creating stepname of the input dataset.

If **YES** is specified for this field, Tape/Copy will replace the creating stepname field on the input datasets with the value of the Creating Stepname Value field as part of the MOVE conversion.

This is useful for marking tapes in the tape management system as being moved by Tape/Copy so that they are not selected again for movement in other Candidate Selection jobs.

Creating Stepname Value: _____

Parameter: INPUT-CREATING-STEPNAME-VALUE

Default Value: OPENTECH

Options: This field allows the user to specify the value Tape/Copy should put into the creating stepname field of the input tape's tape management database record. This field accepts any character string up to 8 characters in length.

Output Volumes

Location/Outcode: **Output:** ___

Parameter: OUTPUT-TAPE-OUTCODE

Default Value: NONE

Options: This field allows the user specify how Tape/Copy should populate the OUTCODE field of the output dataset's tape management system record after the dataset has been converted by Tape/Copy. The valid settings for this field are listed below.

A 2-8 byte alphanumeric value (to be used as the output tape's OUTCODE)

SAME

NONE

See the OUTPUT-TAPE-OUTCODE parameter description in the "Parameter Reference Guide" **for details on the options for this parameter.**

Output File Stacking: ___

Parameter: OUTPUT-FILE-FORMAT

Default Value: ASIS

Options: This field allows the user to specify whether the input datasets should be stacked when written to the output tape (**STACK**), whether stacked input datasets should be separated onto their own tapes when written to the output tapes (**UNSTACK**) or if Tape/Copy should leave the output tapes in the same format (stacked or separate) that they where in as input tapes (**ASIS**).

Stacked Output Options Panel

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
-----------------  Stacked Output Options  ----------------
COMMAND ===>


Candidate Sort Field:     NONE_ None,Crtdt,Expdt,Cxpdt,DSN

Stack Control DSN Prefix: NONE_____________

Output Tape Limit:        NONE
   Minimum Percent Used:  _0
   Percent Used Cutoff:   99

Co-Location Table:        NONE____   Edit: _

ENTER to continue, PF3 to exit.
```

Candidate Sort Field: ___

Parameter: STACKED-OUTPUT-SORT-FIELD

Default Value: NONE

Options: This field allows the user to sort the candidate volume sets by:

CRTDT - by descending creation date

EXPDT - by descending expiration date

CXPDT - by descending calculated expiration date (if any, otherwise it uses the actual expiration date)

DSN - by ascending dataset name

NONE - do not sort the candidate datasets at all

Stack Control DSN Prefix: ___

Parameter: CNV-JOB-STACK-CNTL-FILE-PREFIX

Default Value: NONE

Options: This field is provided for the user to specify the prefix of a Stack Management Control file that Tape/Copy would put as the first file on the stacked output tape. The Stack Management Control File can be used to control the expiration of a stacked tape by placing a permanent retention dataset as the first file on the tape. A valid dataset name prefix (up to 17 bytes in length) may be specified.

Output Tape Limit: ___

Parameter: STACKED-OUTPUT-VOLUME-LIMIT

Default Value: NONE

Options: This field allows the user to specify the maximum number of output volumes each Conversion job should generate. The user can specify a numeric value 1-999, or if **NONE** is specified, there will be no output tape volume limit.

Minimum Percent Used: ___

Parameter: STACKED-OUTPUT-MINIMUM-UTILIZATION

Default Value: 0

Options: This field allows the user to prevent high-capacity tapes from being under-utilized by requiring that the generated Conversion jobs all have enough input data in them to fill the selected output volume full to at least the percentage specified in this field. A percentage of 0-99 is accepted in this field.

Note The Output Tape Limit field must be set to a value other than NONE in order for this value to be used.

Percent Used Cutoff: ___

Parameter: STACKED-OUTPUT-CUTOFF-UTILIZATION

Default Value: 99

Options: This field allows the user to control how much data is moved per Conversion job. As datasets are being added to each Conversion job, the total size of the data in that job is accumulated. When an input tape volume set causes the total size of data to reach or exceed this percentage of volume capacity, multiplied by the value of the Tape Limit field, the Conversion job is “closed off” (no more volumes are added to that Conversion job) and a new Conversion job is started. Valid values are 1-99.

Note The Output Tape Limit field must be set to a value other than NONE in order for this value to be used.

Co-Location Table: _____ **Edit:** _

Parameter: ACTIVE-CO-LOCATION-TABLE

Default Value: N/A

Options: These fields are used to identify an optional Co-Location table to be used in determining which datasets are to be put into Conversion jobs together (i.e. - so that they can be stacked together on the output tape). The first field is for the name of the Tape/Copy PARMLIB member that contains the rules for Co-Location of the tape datasets (such as **COLOCTBL**). If no Co-Location table is to be used, **NONE** should be specified in this field.

An **E** in the Edit field allows the user to create a Co-Location table or edit a pre-existing Co-Location table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

Note For more information on using Co-Location, see Chapter 21.

Output File Cataloging: _____

Parameter: OUTPUT-DATASET-CATALOGING

Default Value: ASIS

Options: This field is used to tell Tape/Copy how to designate the catalog status of the output tape.

ASIS tells Tape/Copy to catalog the output tape if the original dataset was cataloged, and leave the output tape uncataloged if the original dataset is uncataloged.

CATALOG forces the output tape dataset to be cataloged regardless of the catalog status of the input tape.

UNCATALOG leaves the output tape dataset in uncataloged status regardless of the catalog status of the original dataset.

Output File Reblocking: _____ **Edit:**__

Parameter: OUTPUT-FILE-REBLOCKING

Default Value: NONE

Options: This field is used to tell Tape/Copy whether or not to reblock the output file resulting from the conversion, and if so, how to determine what the new blocksize should be.

OPTIMUM - Reblocking is to be attempted using the calculated OPTIMUM blocksize for the output device.

nnnnnn - A numeric value that represents an acceptable block size value for the output device.

>*member* - A Tape/Copy PARMLIB member name of a member containing user defined "rules" to permit Tape/Copy to determine if and/or how to re-block datasets.

NONE - No re-blocking is performed.

An **E** in the Edit field allows the user to create a Reblocking Table or edit a pre-existing Reblocking table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

Note See Chapter 16 for more information on reblocking output files during conversion.

Output File Encryption: _____ **Edit:**__

Parameter: OUTPUT-FILE-ENCRYPTION

Default Value: ASIS

Options: This field is used to tell Tape/Copy whether to encrypt, decrypt, or copy the data without encryption or decryption.

>*member* - A Tape/Copy PARMLIB member name of a member containing user defined "rules" to permit Tape/Copy to determine if and/or how to encrypt datasets.

DECRYPT - All CopyCrypt encrypted files will be decrypted.

ASIS - No encryption or decryption will be performed.

An **E** in the Edit field allows the user to create an Encryption Rules Table or edit a pre-existing Encryption Rules Table using ISPF edit mode. A **B** in the Edit field brings up the specified member in browse mode.

Note Encryption is only available to users licensed to use the CopyCrypt product option. See the CopyCrypt User Guide for more information on CopyCrypt.

Conversion Job Triggering: ___

Parameter: CNV-JOB-TRIGR-FUNCTIONS

Default Value: NO

Options: This field allows the user to specify whether or not the Conversion Job Triggering feature should be used. **YES** will indicate that the user wishes to use Conversion Job Triggering; **NO** indicates that Conversion Job Triggering will not be used.

If this field is set to **YES**, the user can specify the Conversion Job Triggering options using the Conversion Job Trigger Function Setup panel, discussed below.

Note See Chapter 14 for more information on the Conversion Job Triggering feature.

Set TRIGR Options: ___

Parameter: N/A

Default Value: NO

Options: This field is used to display the Conversion Job Triggering Function Setup pop-up panel. This field will only cause the panel to be displayed if the Conversion Job Triggering field is set to YES. Entering **YES** in this field will bring up the Conversion Job Trigger Function Setup panel (shown below); entering **NO** (the default) will tell Tape/Copy not to display the panel, but Tape/Copy will use the parameter settings that were last saved.

Conversion Job Trigger Function Setup Panel

```
------------  OpenTech Tape/Copy System Rx.x.x  -----------
---------  Conversion Job Trigger Function Setup  ---------
COMMAND ===>

Control Dataset: NONE_____________________________________
        Members: Max Count= 1000  Allow Wrap= NO_

Trigger Action:  NONE_____

  CREATEDSN DSN= NONE_____________________________________

  ISSUEWTO  DSN= NONE_____________________________________
         Member= NONE____   Edit: _

  SUBMITJOB DSN= NONE_____________________________________
         Member= NONE____   Edit: _

ENTER to continue, PF3 to exit.
```

Control Dataset: _____

Members: Max Count= ____ Allow Wrap=____

Parameter: CNV-JOB-TRIGR-CTRL-DSN
CNV-JOB-TRIGR-MAXIMUM-MEMBER-COUNT
CNV-JOB-TRIGR-MEMBER-WRAP

Default Value: NONE
1000, NO

Options: These fields are used to specify information about the Job Triggering control dataset.

If **NONE** is specified in the Control Dataset field, Tape/Copy will assign a dataset consisting of the value of the DYNAMIC-ALLOCATION-DATASET-NAME-PREFIX parameter value, plus the suffix 'TCCONV.CONTROL'. If the user wishes to specify a different dataset to be used as the control dataset, **the dataset identified must be a PDSE with an LRECL of 80 and have a RECFM of FB (fixed block) or F (fixed).**

The Max Count field accepts a numeric value 1-522236 (number of members allowed in the control dataset).

If Allow Wrap is set to **YES**, Tape/Copy will overlay members in the control dataset when the Max Count specified is reached. If Allow Wrap is set to **NO**, Tape/Copy will terminate when the Max Count specified is reached.

Trigger Action: ___

Parameter: CNV-JOB-TRIGR-ACTIONS

Default Value: NONE

Options: This field allows the user to specify what actions are to be taken when all jobs which make up the conversion job set created by this Candidate Selection process have completed. The valid values are:

CREATEDSN - Cause the conversion job to create a dataset (name specified by the user) when all jobs related to the current conversion operation have completed.

ISSUEWTO - Cause the conversion job to issue a WTO to the MVS console. The text of the WTO message is user specified (see Chapter 14).

SUBMITJOB - Cause the conversion job to submit a job from a user specified dataset/member into the MVS Internal Reader.

Note Each of the above selections require the associated fields on the Conversion Job Trigger Function Setup panel be completed.

CREATEDSN DSN= _____

Parameter: CNV-JOB-TRIGR-CREATE-DSN

Default Value: NONE

Options: This field identifies the dataset name to be created when all conversion jobs in the conversion job set created by this Candidate Selection job have completed.

The Trigger Action field must be set to CREATEDSN in order for this value to be used. If the Trigger Action field is set to any other value, the CREATEDSN DSN field should be set to NONE.

If the dataset name specified in this field already exists when Tape/Copy attempts to create it, a U0100 abend will occur. A process should be implemented by the user that will delete this trigger dataset after it has been used by the scheduling package so that it does not exist the next time Tape/Copy tries to create it.

```
ISSUEWTO DSN=  ______________________________
 Member=  ___________  Edit: _
```

Parameter: CNV-JOB-TRIGR-WTO-DSN
CNV-JOB-TRIGR-WTO-MEMBER

Default Value: NONE
NONE

Options: These fields identify the dataset name (and member name, if applicable) which contains the text to be issued as a WTO when all conversion jobs in the conversion job set created by this Candidate Selection job have completed. If the dataset identified by the ISSUEWTO DSN field is a PDS, the Member field must also be set to tell Tape/Copy which member in that dataset contains the text Tape/Copy should issue as a WTO upon completion of the conversion job set.

An **E** in the Edit field allows the user to create a dataset/member or edit a pre-existing dataset/member using ISPF edit mode. A **B** in the Edit field brings up the specified dataset/member in browse mode.

The Trigger Action field must be set to ISSUEWTO in order for this value to be used. If the Trigger Action field is set to any other value, the ISSUEWTO DSN field should be set to NONE. See Chapter 14.

```
SUBMITJOB DSN=  ______________________________
  Member=  ___________  Edit:
```

Parameter: CNV-JOB-TRIGR-SUBMIT-DSN
CNV-JOB-TRIGR-SUBMIT-MEMBER

Default Value: NONE
NONE

Options: These fields identify the dataset name (and member name, if applicable) which contains the job Tape/Copy should submit when all conversion jobs in the conversion job set created by this Candidate Selection job have completed. If the dataset identified by the SUBMITJOB DSN field is a PDS, the Member field must also be set to tell Tape/Copy which member in that dataset contains the job Tape/Copy should submit upon completion of the conversion job set.

An **E** in the Edit field allows the user to create a dataset/member or edit a pre-existing dataset/member using ISPF edit mode. A **B** in the Edit field brings up the specified dataset/member in browse mode.

The Trigger Action field must be set to SUBMITJOB in order for this value to be used. If the Trigger Action field is set to any other value, the SUBMITJOB DSN field should be set to NONE.

Use Advanced Recall Interface: NO_

Parameter: USE-ADVR-INTERFACE

Default Value: NO

Options: This field determines whether or not the conversion job should create a Advanced Recall Candidate file to pass to the Advanced Recall product so that Advanced Recall can recall any virtual tape volumes needed by the conversion job that are not already in virtual tape cache. This will reduce virtual tape recall delays for the conversion job. If set to YES, the Tape/Copy / Advanced Recall interface will be used. If set to NO, the interface will not be used.

In order for this field to be available, the ADVR-ROUTING-FILE-NAME parameter must be set to a value other than NONE in the USERSETS member of the Tape/Copy PARMLIB. If the ADVR-ROUTING-FILE-NAME parameter is set to NONE (the default), the "Use Advanced Recall Interface:" field will be set to NO and the field will not be available for updates until the ADVR-ROUTING-FILE-NAME parameter is added to and updated in USERSETS with a valid routing file name.

Note See Chapter 12 for more information about the Advanced Recall Interface. The Advanced Recall Interface is available only to users that have licensed authority to use the Advanced Recall product.

Conversion Job Jobcard JCL:

Parameter: CONVERSION-JOB-NAME

Default Value: N/A

Options: A standard JCL job statement with a valid job name and accounting information for your data center is required. A sample JOB statement will appear as the first time default. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Conversion job unless changed here by the user.

Notify Userids: _____ _____ _____ _____ _____ _____

Parameter: NOTIFY-USERID

Default Value: N/A

Options: These fields allow the user to control the assignment of multiple user ids for notification purposes of the Candidate Selection and Conversion jobs. The notifies are internally issued TSO SENDs for all user ids listed as the 2nd through 7th user ids. The 1st user id is placed in the NOTIFY parameter of all of the generated JCL.

30 Audit Log Report Panel Option

Topics Covered In This Chapter

Audit Log Report Selection Panel (page 30-3)

Audit Log Report Job Parameters Panel (page 30-9)

Introduction

The Audit Log Report option is selection number 4 (four) on the Tape/Copy Primary Selection Panel. This option is used to generate an Audit Log Report of the conversions performed by Tape/Copy that meet the criteria specified on the Audit Log Report Selection panel.

For more information on Tape/Copy's Audit Feature, see Chapter 7. Also note that the report generated through the ISPF panel option will include a report on all cataloged generations of the Audit Log file. To generate a report using only a particular generation, a DD statement override is required using the AUDITLOG DD.

Example

```
//AUDITLOG DD DISP=SHR,DSN=OT.TAPECOPY.AUDITLOG(0)
```

The Audit Log Report option contains two ISPF panels that are completed by the user. The user enters the required information on the first panel, then hits ENTER to proceed to the second panel.

Both panels must be completed before the Audit Log Report JCL is generated.

The panels appear in the order they are listed here (click the panel name to go to that panel's description):

- **Audit Log Report Selection Panel**

  This panel is used to specify the criteria by which the Audit Log Report should be created.

- **Audit Log Report Job Parameters Panel**

  This panel is used to specify the Audit Log Reporting jobs characteristics.

Audit Log Report Selection Panel

The contents reported on the Audit Log Report is controlled by the parameters selected by the user on the Audit Log Report Selection panel. The Audit Log Report Selection panel is invoked by selecting option 4, “Audit Log Rpt” on Tape/Copy’s Primary Selection panel.

Example

```
---------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
------------------------  Audit Log Report Selection  ----------------------
COMMAND ===>
Select on:
 Dataset Name: ____________________________________________
         Audit Date:  Min __________ Max __________
         Audit Time:  Min ________   Max ________
           Job Name:      ________
         Job Number:  Min _____      Max _____
 Input  Volser Range: From ______      To ______
   Input  Media Type:      ________
 Tape Management System Version/Release:   ____________
  Conversion Job Trigger Control Member:   ________
       Conversion Job Trigger Token Set:   ____

   Use Parmlib INCL/EXCL member filters:   ___

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____      _
_____________________________________________________________
  _    ____      _
_____________________________________________________________
  _    ____      _
_____________________________________________________________
  _    ____      _
_____________________________________________________________

ENTER to continue, PF3 to exit.
```

Note Typing ‘DEFAULT’ on the command line will populate all ISPF fields with the system default parameters specified in the Tape/Copy parameter library.

Note The fields on the panel above are discussed on the next few pages of this chapter.

Audit Log Report Selection Fields & Defaults

The following fields appear on the Audit Log Report Selection panel and are listed in the order they appear on this panel. The values you enter into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Dataset Name: _____

Parameter: N/A

Default Value: N/A

Options: This field allows the user to select tape dataset names matching the dataset name or dataset name pattern entered into this field. This field allows the use of OpenTech Systems' wildcards (see Appendix A for valid wildcards and their uses).

If multiple dataset name ranges are required, a dataset name inclusion/exclusion list needs to be defined and targeted by the Audit Log selection job (see the Pattern Type Incl/Excl Dataset Edit/Sel fields).

Audit Date: Min _____ **Max** _____

Parameter: N/A

Default Value: 999

0

Options: These fields allow the user to include audit records for tapes that were Tape/Copy created by a "MOVE" operation between the minimum and maximum dates entered. (The value you specify in the Min. field will tell Tape/Copy not to select any audit records created after that date. The value you specify in the Max. field will tell Tape/Copy not to select any audit records created before that date.) These fields will accept a number of days, a Julian date (yyyy.ddd) or a Gregorian date (mm/dd/yyyy) entry.

Audit Time: Min _____ **Max** _____

Parameter: N/A

Default Value: 00:00:00

23:59:59

Options: These fields allow the user to include any tape datasets that were Tape/Copy created between the minimum and maximum times entered on the dates defined by the Audit Date fields. These fields require a time entry in 24-hour format (hh:mm:ss).

Warning The Audit Date field must be given valid values before the Audit Time parameters can be used.

Job Name: _____

Parameter: N/A

Default Value: N/A

Options: This field allows the user to select Tape/Copy conversion job names matching the job name or job name pattern entered. This field allows the use of OpenTech Systems' wildcards (see Appendix A for valid wildcards and their uses).

If multiple job name ranges are required, a job name inclusion/exclusion list needs to be defined and targeted by the Audit Log selection job (see the Pattern Type Incl/Excl Dataset Edit/Sel fields).

Job Number: Min _____ **Max** _____

Parameter: N/A

Default Value: 00000

99999

Options: These fields allow the user to select audit records based on the JES job numbers of the Tape/Copy conversion jobs. The Audit Log Report process will include any tape datasets that were created by Tape/Copy between the minimum and maximum job numbers entered in these fields. The values must be 5 digit numeric values.

These job numbers are used in conjunction with the job name if the job name parameter is entered. Otherwise, all job names will be accepted within the specified job number range.

Input/Output Volser Range: From: _____ To: _____

Parameter: N/A

Default Value: $

999999

Options: These fields allow the user to target a specific range of tape volume serial numbers in the tape library. The Audit Log Report selection criteria will be limited to tape volume serial numbers within this range.

For multi-volume datasets, if any of the volsers fall within the selected range, the dataset will be selected. If multiple volume ranges are required, a volume inclusion list needs to be defined and targeted by the Audit Log selection job (see the Pattern Type Incl/Excl Dataset Edit/Sel fields).

Note By default, Input volume serial numbers are used by the Audit Log Report selection criteria. However, the user can type over the word "Input" with the word "Output" in order to select Audit Log records based on the Output volume serial numbers. (Entering just an "I", for Input, or and "O", for Output, will also populate the entire field name.)

Input/Output Media Type: _____

Parameter: N/A

Default Value: N/A

Options: This field allows the user to target a specific type of tape media for either input or output selection. The valid media types for use in this field can vary from data center to data center and are defined in the IOCNTLTB member of the Tape/Copy PARMLIB library (in the Media Names column).

ALL can be used to select audit records for all media types.

Note By default, the Input media type is used by the Audit Log Report selection criteria. However, the user can type over the word "Input" with the word "Output" in order to select Audit Log records based on the Output media type. (Entering just an "I", for Input, or and "O", for Output, will also populate the entire field name.)

Tape Management System Version/Release: _____

Parameter: TAPE-MANAGEMENT-SYSTEM

Default Value: The current value of the TAPE-MANAGEMENT-SYSTEM parameter in the USERSETS member of the PARMLIB

Options: This field is used to identify the tape management system version and release that was used at the time the Audit Log records were created. This is useful if the data center has used more than one release of tape management system or has converted to a different tape management system and only wants to select Audit Log records from a specific tape management system.

Conversion Job Trigger Control Member: _____

Parameter: CNV-JOB-TRIGR-CONTROL-MEMBER

Default Value: The current value of the CNV-JOB-TRIGR-CONTROL-MEMBER parameter in the USERSETS member of the PARMLIB

Options: This field allows the user to limit the Audit Log Report's contents to only the conversion jobs listed in the Conversion Job Trigger Control Member.

Conversion Job Trigger Token Set: ____

Parameter: CNV-JOB-TRIGR-TOKEN-SET

Default Value: N/A

Options: This field allows the user to limit the Audit Log Report's contents to only the conversion jobs created under the listed Token Set.

Use Parmlib INCL/EXCL member filters:____

Parameter: N/A

Default Value: YES

Options: **YES** - the filtering performed using the default Include and Exclude members of the PARMLIB will be applied.

NO - the filtering normally performed using the default Include and Exclude members of the PARMLIB will not be applied.

Edit Pattern Incl

/Sel Type /Excl Dataset (containing the patterns)

Parameter: N/A

Default Value: N/A

Options:

Edit/Sel:

B - displays the specified dataset in ISPF browse mode

E - creates a member in a predefined dataset or edits the include/exclude pattern in the dataset specified

S - selects the include/exclude pattern dataset for processing

Pattern Type:

DSNS - dataset specified contains dataset name patterns

JOBS - dataset specified contains conversion job name patterns

VOLS - dataset specified contains volume serial number patterns

Incl/Excl:

I - include only audit log records matching the patterns in the dataset specified

E - exclude all audit log records matching the patterns in the dataset specified

Dataset:

Dataset where the include/exclude patterns are defined (**NOT** the pattern itself)

Up to four include/exclude pattern datasets may be manipulated containing either "include only" or "exclude" patterns. These "pattern" datasets can contain specific fully qualified lists, or are allowed the use of OpenTech Systems' wildcards (see Appendix A for valid wildcards and their uses). The pattern dataset should be fixed block (RECFM=FB) and have a logical record length of 80 (LRECL=80).

Note In order for the Audit Log Report selection job to use the pattern dataset in processing, the user must place an S (select) in the Edit/Sel field before pressing ENTER to advance to the next panel.

All the default include/exclude Tape/Copy PARMLIB members that are shipped with the product for use with include/exclude processing are always processed during Candidate Selection, regardless of the include/exclude pattern datasets specified on this ISPF panel. These pre-defined PARMLIB members begin with "INCL" (include) or "EXCL" (exclude) - INCLDSNS and EXCLVOLS, for example. If the user specifies a pattern dataset on the Candidate Selection panel AND has patterns/values defined in the pre-defined Tape/Copy PARMLIB members, Tape/Copy uses both. The user should take care not to define conflicting values.

Audit Log Report Job Parameters Panel

Once you have completed the fields on the Audit Log Selection Panel and press ENTER, the Audit Log Report Job Parameters panel (below) is displayed.

Example

```
----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
----------------------  Audit Log Report Job Parameters  --------------------
COMMAND ===>

Save Report Job JCL to DSN= ____________________________________________

Audit Log Report Job Jobcard JCL:

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________



ENTER to submit Audit Log Report Job, PF3 to return to previous panel.
```

Audit Log Report Job Fields & Defaults

The second ISPF panel used in producing the Audit Log Report is the Audit Log Report Job Parameters panel. This panel allows the user to save the Audit Log Report job JCL to a dataset and offers options for restarting the report job if a failure should occur. The values entered into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Save Report Job JCL to DSN=_____

Parameter: N/A

Default Value: N/A

Options: This field allows the user to specify the name of a dataset to which they would like to save the Audit Log Report JCL. The dataset name must be fully qualified but without enclosing quotes. This feature is helpful for those who would like to save the Audit Log Report JCL and use their job scheduling package to have it run at regularly scheduled intervals.

If the dataset is a preexisting PDS, the name of a member in the specified PDS should be entered along with the dataset name (ex. OT.TAPECOPY.JCL.CNTL(AUDITRPT)). If the user wishes to create a new member within an existing PDS, they can enter the PDS name and the new member name and Tape/Copy will create the new member.

Warning If the member name specified already exists in the PDS, please be advised that the contents of this member will be overwritten.

If a dataset name is provided in this field, the Audit Log Report JCL will be displayed in ISPF edit mode after the user presses ENTER on this page. However, if a dataset name is not provided in this field, the Audit Log Report JCL will not be kept and will not be displayed for review before the job is submitted.

Candidate Job Jobcard JCL:

Parameter:	N/A
Default Value:	N/A
Options:	A standard JCL job card with a valid jobname and accounting information for your data center is required. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Audit Log Report job unless changed here by the user.

31 Tape Analysis Panel Option

Topics Covered In This Chapter

Tape Analysis Panel (page 31-2)

Introduction

The Tape Analysis option is selection number 5 (five) on the Tape/Copy Primary Selection Panel. This option is used to generate a job to analyze the dataset, tape or volume set specified by the user on the ISPF panel.

Note For more information on Tape/Copy's Tape Analysis feature, see Chapter 24.

The Tape Analysis option consists of one ISPF panel (the **Tape Analysis Panel),** and a second optional panel (the **Analysis File Multivolume Entry Panel**), that are completed by the user. The user enters the required information on the panel, then hits ENTER to generate the Tape Analysis job JCL.

Tape Analysis Panel

The fields on the Tape Analysis panel are used to generate the parameters in the generated Tape Analysis job JCL. An example of this screen is listed below, as well as descriptions of the fields on the ISPF panel.

Example

```
   ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
   ------------------------------  Tape Analysis  ----------------------------

   COMMAND ===>

   Analysis Scope:             _______    (DATASET, VOLUME, VOLSET)

   Analysis Input
     Dataset Name:            ____________________________________________
     1st Volser:              ______     More? ______   (YES, NO, UPDATE)
     File Sequence Number:     _____      (1-32768)
     Label Type:              ___        (SL, NL, BLP, SUL, LTM, AL, AUL)
     Use EXPDT=98000:          ___       (YES, NO)
     Media Type:               ________
     RACF Auth Checking:       __________

   Analysis Jobcard JCL:
          //
*_____________________________________________________________________
          //
*_____________________________________________________________________
          //
*_____________________________________________________________________
          //
*_____________________________________________________________________

   Press ENTER to generate job or PF3 to exit
```

Tape Analysis Fields & Defaults

The following fields appear on the Tape Analysis panel and are listed in the order they appear on this panel. The values you enter into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Analysis Scope: _____ (DATASET, VOLUME, VOLSET)

Parameter: N/A

Default Value: N/A

Options: This field is used to define the SCOPE of the analysis. The valid values are **DATASET** (for analysis of a single dataset), **VOLUME** (for analysis of a single volume) or **VOLSET** (for analysis of a complete volume set).

Analysis Input
Dataset Name: _____

Parameter: N/A

Default Value: N/A

Options: This field is used to define the dataset name of the dataset to be analyzed and is required when the Scope is set to DATASET or VOLUME and the Label Type field (see below) is set to SL, SUL, AL, or AUL).

For SCOPE=VOLSET this field may contain any dataset name that conforms to your installation standards for JCL and/or Device allocation routines.

1st Volser: _____ More? ____ (YES,NO,UPDATE)

Parameter: N/A

Default Value: N/A

Options: The 1st Volser field is used to define a single volser to used for analysis, or the first volser in a volset.

If this field is left blank but the Dataset Name field is populated with a cataloged dataset name, Tape/Copy will populate this field with the volser information taken from the ICF catalog.

1st Volser: _____ More? ____ (YES,NO,UPDATE)

Parameter: N/A

Default Value: N/A

Options: The **More?** field is used in conjunction with the Dataset Name field, and is available if SCOPE=DATASET. If SCOPE=DATASET and more volumes are associated with the listed dataset, the More? field will contain “YES”. If there are not more volumes associated with the dataset listed, the More? field will contain “NO”. If the user wishes to view or make updates to the volume list associates with the dataset listed for analysis, they can do so by changes the More? field to “UPDATE” and pressing enter. This will display the **Analysis File Multivolume Entry Panel** below.

Analysis File Multivolume Entry Panel

```
----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
----------------------  Analysis File Multivolume Entry  --------------------

COMMAND ===>

Enter the volsers next to the corresponding volume sequence.  When all volsers
have been entered type END to save and exit or CANCEL to exit without saving.
Type CLEAR to reset all volumes.
                                                                   More:     +
  1, 000031   2, 000032   3, ______   4, ______   5, ______   6, ______
  7, ______   8, ______   9, ______  10, ______  11, ______  12, ______
 13, ______  14, ______  15, ______  16, ______  17, ______  18, ______
 19, ______  20, ______  21, ______  22, ______  23, ______  24, ______
 25, ______  26, ______  27, ______  28, ______  29, ______  30, ______
 31, ______  32, ______  33, ______  34, ______  35, ______  36, ______
 37, ______  38, ______  39, ______  40, ______  41, ______  42, ______
 43, ______  44, ______  45, ______  46, ______  47, ______  48, ______
 49, ______  50, ______  51, ______  52, ______  53, ______  54, ______
 55, ______  56, ______  57, ______  58, ______  59, ______  60, ______
 61, ______  62, ______  63, ______  64, ______  65, ______  66, ______
 67, ______  68, ______  69, ______  70, ______  71, ______  72, ______
 73, ______  74, ______  75, ______  76, ______  77, ______  78, ______
```

This is a scrolling panel and allows up to 255 volumes to be listed. Volumes must be listed in sequence, skipping a volume sequence will result in an error. When the user is done viewing and/or updating the volser list they can enter "END" to exit and save the new list or "CANCEL" to exit without saving the new list. The "CLEAR" command can be used to reset all the volser values to null values.

File Sequence Number: _____ (1-32768)

Parameter: N/A

Default Value: 1

Options: This field is used to identify the file sequence position of the dataset to be analyzed on the volume. Valid value is a number from

1 - 32768.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with information from the ICF catalog.

Label Type: _____ (SL, NL, BLP, SUL, LTM, AL, AUL)

Parameter: N/A

Default Value: N/A

Options: This field is used to identify the label type of the volume(s) to be analyzed. Valid values are SL, ML, BLP, SUL, LTM, AL, or AUL.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with label type information from the ICF catalog.

Use EXPDT=98000: ___ (YES, NO)

Parameter: N/A

Default Value: N/A

Options: This field is used to tell Tape/Copy whether the analysis JCL should include EXPDT=9800 to prevent the tape management system OPEN routines from updating the input tape dataset record in its database. Valid options are YES (use EXPDT=98000 in the job) or NO (do not use EXPDT=98000 in the job).

Media Type: _____

Parameter: N/A

Default Value: N/A

Options: This field is used to identify the input media type of the volume(s) to be analyzed. Any media type from the IOCNTLTB member of the Tape/Copy PARMLIB is considered a valid value.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with the device type information from the ICF catalog and indexed against the UCBDTYPE member of the Tape/Copy PARMLIB to determine the proper generic unit name.

RACF Auth Checking: _____

Parameter: RACF-AUTHORIZATION-CHECKING

Default Value: NO

Options: This field allows the users to specify whether Tape/Copy should perform RACF authorization checking on the selected datasets.

If this field is set to **NO** or **NONE**, then no authorization checking is performed on the datasets.

If this field is set to **U=xxxxxxxx** (where xxxxxxxx is a valid user id) or **CURRENT** (the user id submitting the analysis job), Tape/Copy will check the RACF authority of the user id to verify that this user has the authority to read/access the datasets being analyzed. Datasets that the user id does not have the authority to process will be rejected.

Analysis Jobcard JCL:

Parameter: N/A

Default Value: N/A

Options: A standard JCL job card with a valid jobname and accounting information for your data center is required. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Tape Analysis submitted through the ISPF panels job unless changed here by the user.

32 Tape Compare Panel Option

Topics Covered In This Chapter

Tape Compare Panel (page 32-2)

Introduction

The Tape Compare option is selection number 6 (six) on the Tape/Copy Primary Selection Panel. This option is used to generate a job to either physically or logically compare two datasets or volume sets as specified by the user on the ISPF panel.

Note For more information on Tape/Copy's Tape Compare feature, see Chapter 24.

The Tape Compare option consists of one ISPF panel (the **Tape Compare Panel),** and two other panels (the **Compare DSN1 Multivolume Entry Panel** and **Compare DSN2 Multivolume Entry Panel**), that are completed by the user. The user enters the required information on the panel, then hits ENTER to generate the Tape Compare job JCL.

Note Please note that the Tape Compare panel is a scrollable panel and PF7 (UP) and PF8 (DOWN) keys can be used to scroll up and down on the panel to display all of the fields.

Tape Compare Panel

The fields on the Tape Compare panel are used to generate the parameters in the generated Tape Compare job JCL. An example of this screen is listed below, as well as descriptions of the fields on the ISPF panel.

Example

```
 ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
 -------------------------------  Tape Compare  ----------------------------
COMMAND ===>
 Press ENTER to generate job or PF3 to exit
                                                                   More:     +
 Compare Scope:                _________   (DATASET, VOLSET)

Compare Mode:                 _________   (PHYSICAL, LOGICAL)

 Compare Input 1
  Dataset Name:              ____________________________________________
  1st Volser:                ______      More? ______   (YES, NO, UPDATE)
  File Sequence Number:      _____        (1-32768)
  Label Type:                ___         (SL, NL, SUL, LTM, AL, AUL)
  Use EXPDT=98000:           ___          (YES, NO)
  Media Type:                _________

 Compare Input 2
  Dataset Name:              ____________________________________________
  1st Volser:                ______      More? ______   (YES, NO, UPDATE)
  File Sequence Number:      _____        (1-32768)
  Label Type:                ___         (SL, NL, SUL, LTM, AL, AUL)
  Use EXPDT=98000:           ___          (YES, NO)
  Media Type:                _________
RACF Auth Checking:          __________
Compare Jobcard JCL:
//*_____________________________________________________________________
//*_____________________________________________________________________
//*_____________________________________________________________________
//*_____________________________________________________________________
```

Tape Compare Fields & Defaults

The following fields appear on the Tape Compare panel and are listed in the order they appear on this panel. The values you enter into the fields on this panel will override the values of the parameters that are in DEFAULTS and USERSETS members of the PARMLIB.

Compare Scope: _____ (DATASET, VOLSET)

Parameter: N/A

Default Value: N/A

Options: This field is used to define the SCOPE of the compare. The valid values are **DATASET** (for compare of two datasets) or **VOLSET** (for comparing two separate volume sets).

Compare Mode: _____ (PHYSICAL, LOGICAL)

Parameter: N/A

Default Value: N/A

Options: This field is used to define the MODE of the compare. The valid values are:

PHYSICAL - compare the files/volsets on a block-by-block basis

LOGICIAL - compare the files/volsets at a logical record level. (This MODE should be used to allow two tape files with different block sizes to be compared based on the contents of each logical record.)

Compare Input 1
Dataset Name: _____

Parameter: N/A

Default Value: N/A

Options: This field is used to define the dataset name of the dataset to be compared and is required when the Scope is set to DATASET and the Label Type field (see below) is set to SL, SUL, AL, or AUL).

For SCOPE=VOLSET this field may contain any dataset name that conforms to your installation standards for JCL and/or Device allocation routines

```
Compare Input 1
   1st Volser: ______     More? ____   (YES,NO,UPDATE)
```

Parameter: N/A

Default Value: N/A

Options: The 1st Volser field is used to define a single volser to used for comparison, or the first volser in a volset.

If this field is left blank but the Dataset Name field is populated with a cataloged dataset name, Tape/Copy will populate this field with the volser information taken from the ICF catalog.

```
Compare Input 1
   1st Volser: ______     More? ____   (YES,NO,UPDATE)
```

Parameter: N/A

Default Value: N/A

Options: The **More?** field is used in conjunction with the Dataset Name field, and is available if SCOPE=DATASET. If SCOPE=DATASET and more volumes are associated with the listed dataset, the More? field will contain “YES”. If there are not more volumes associated with the dataset listed, the More? field will contain “NO”. If the user wishes to view or make updates to the volume list associates with the dataset listed for comparison, they can do so by changes the More? field to “UPDATE” and pressing enter. This will display the **Compare DSN1 Multivolume Entry Panel** below.

Compare DSN1 Multivolume Entry Panel

```
  ----------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
  ----------------------  Compare DSN1 Multivolume Entry  --------------------

   COMMAND ===>

   Enter the volsers next to the corresponding volume sequence.  When all
volsers
   have been entered type END to save and exit or CANCEL to exit without saving.
   Type CLEAR to reset all volumes.
                                                                   More:     +
     1, ______    2, ______    3, ______    4, ______    5, ______    6, ______
     7, ______    8, ______    9, ______   10, ______   11, ______   12, ______
    13, ______   14, ______   15, ______   16, ______   17, ______   18, ______
    19, ______   20, ______   21, ______   22, ______   23, ______   24, ______
    25, ______   26, ______   27, ______   28, ______   29, ______   30, ______
    31, ______   32, ______   33, ______   34, ______   35, ______   36, ______
    37, ______   38, ______   39, ______   40, ______   41, ______   42, ______
    43, ______   44, ______   45, ______   46, ______   47, ______   48, ______
    49, ______   50, ______   51, ______   52, ______   53, ______   54, ______
    55, ______   56, ______   57, ______   58, ______   59, ______   60, ______
    61, ______   62, ______   63, ______   64, ______   65, ______   66, ______
    67, ______   68, ______   69, ______   70, ______   71, ______   72, ______
    73, ______   74, ______   75, ______   76, ______   77, ______   78, ______
```

This is a scrolling panel and allows up to 255 volumes to be listed. Volumes must be listed in sequence, skipping a volume sequence will result in an error. When the user is done viewing and/or updating the volser list they can enter "END" to exit and save the new list or "CANCEL" to exit without saving the new list. The "CLEAR" command can be used to reset all the volser values to null values.

Compare Input 1

File Sequence Number: _____ (1-32768)

Parameter: N/A

Default Value: 1

Options: This field is used to identify the file sequence position of the dataset to be compared on the volume. Valid value is a number from

1 - 32768.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with information from the ICF catalog.

```
Compare Input 1
   Label Type: _____  (SL, NL, BLP, SUL, LTM, AL, AUL)
```

Parameter: N/A

Default Value: N/A

Options: This field is used to identify the label type of the first volume(s) to be compared. Valid values are SL, ML, BLP, SUL, LTM, AL, or AUL.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with label type information from the ICF catalog.

```
Compare Input 1
    Use EXPDT=98000: ___ (YES, NO)
```

Parameter: N/A

Default Value: N/A

Options: This field is used to tell Tape/Copy whether the compare JCL should include EXPDT=9800 to prevent the tape management system OPEN routines from updating the input tape dataset record in its database. Valid options are YES (use EXPDT=98000 in the job) or NO (do not use EXPDT=98000 in the job).

```
Compare Input 1
    Media Type: ______
```

Parameter: N/A

Default Value: N/A

Options: This field is used to identify the input media type of the first volume(s) to be compared. Any media type from the IOCNTLTB member of the Tape/Copy PARMLIB is considered a valid value.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with the device type information from the ICF catalog and indexed against the UCBDTYPE member of the Tape/Copy PARMLIB to determine the proper generic unit name.

```
Compare Input 2
   Dataset Name: ________________________________
```

Parameter: N/A

Default Value: N/A

Options: This field is used to define the dataset name of the second dataset to be compared and is required when the Scope is set to DATASET or if the Label Type field (see below) is set to SL, SUL, AL, or AUL).

If this field is left blank, a dummy dataset name will be generated using the pattern *userid*.V*volser*.DUMMY.DATASET2.NAME.

```
Compare Input 2
   1st Volser: ______     More? ____   (YES,NO,UPDATE)
```

Parameter: N/A

Default Value: N/A

Options: The 1st Volser field is used to define a single volser to used for comparison, or the first volser in a volset.

If this field is left blank but the Dataset Name field is populated with a cataloged dataset name, Tape/Copy will populate this field with the volser information taken from the ICF catalog.

```
Compare Input 2
   1st Volser: ______     More? ____   (YES,NO,UPDATE)
```

Parameter: N/A

Default Value: N/A

Options: The **More?** field is used in conjunction with the Dataset Name field, and is available if SCOPE=DATASET. If SCOPE=DATASET and more volumes are associated with the listed dataset, the More? field will contain “YES”. If there are not more volumes associated with the dataset listed, the More? field will contain “NO”. If the user wishes to view or make updates to the volume list associates with the dataset listed for comparison, they can do so by changes the More? field to “UPDATE” and pressing enter. This will display the **Compare DSN2 Multivolume Entry Panel** below.

Compare DSN2 Multivolume Entry Panel

```
----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
 ----------------------  Compare DSN2 Multivolume Entry  ---------------------

 COMMAND ===>

 Enter the volsers next to the corresponding volume sequence.  When all volsers
 have been entered type END to save and exit or CANCEL to exit without saving.
 Type CLEAR to reset all volumes.
                                                                   More:     +
   1, ______    2, ______    3, ______    4, ______    5, ______    6, ______
   7, ______    8, ______    9, ______   10, ______   11, ______   12, ______
  13, ______   14, ______   15, ______   16, ______   17, ______   18, ______
  19, ______   20, ______   21, ______   22, ______   23, ______   24, ______
  25, ______   26, ______   27, ______   28, ______   29, ______   30, ______
  31, ______   32, ______   33, ______   34, ______   35, ______   36, ______
  37, ______   38, ______   39, ______   40, ______   41, ______   42, ______
  43, ______   44, ______   45, ______   46, ______   47, ______   48, ______
  49, ______   50, ______   51, ______   52, ______   53, ______   54, ______
  55, ______   56, ______   57, ______   58, ______   59, ______   60, ______
  61, ______   62, ______   63, ______   64, ______   65, ______   66, ______
  67, ______   68, ______   69, ______   70, ______   71, ______   72, ______
  73, ______   74, ______   75, ______   76, ______   77, ______   78, ______
```

This is a scrolling panel and allows up to 255 volumes to be listed. Volumes must be listed in sequence, skipping a volume sequence will result in an error. When the user is done viewing and/or updating the volser list they can enter "END" to exit and save the new list or "CANCEL" to exit without saving the new list. The "CLEAR" command can be used to reset all the volser values to null values.

Compare Input 2

File Sequence Number: _____ (1-32768)

Parameter: N/A

Default Value: 1

Options: This field is used to identify the file sequence position of the dataset to be compared on the volume. Valid value is a number from

1 - 32768.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with information from the ICF catalog.

```
Compare Input 2
   Label Type: _____  (SL, NL, BLP, SUL, LTM, AL, AUL)
```

Parameter: N/A

Default Value: N/A

Options: This field is used to identify the label type of the second volume(s) to be compared. Valid values are SL, ML, BLP, SUL, LTM, AL, or AUL.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with label type information from the ICF catalog.

```
Compare Input 2
    Use EXPDT=98000: ___ (YES, NO)
```

Parameter: N/A

Default Value: N/A

Options: This field is used to tell Tape/Copy whether the compare JCL should include EXPDT=9800 to prevent the tape management system OPEN routines from updating the input tape dataset record in its database. Valid options are YES (use EXPDT=98000 in the job) or NO (do not use EXPDT=98000 in the job).

```
Compare Input 2
    Media Type: ______
```

Parameter: N/A

Default Value: N/A

Options: This field is used to identify the input media type of the second volume(s) to be compared. Any media type from the IOCNTLTB member of the Tape/Copy PARMLIB is considered a valid value.

If the Volser field is left blank and the Dataset Name field contains a cataloged dataset name, this field will be populated with the device type information from the ICF catalog and indexed against the UCBDTYPE member of the Tape/Copy PARMLIB to determine the proper generic unit name.

RACF Auth Checking: _____

Parameter: RACF-AUTHORIZATION-CHECKING

Default Value: NO

Options: This field allows the users to specify whether Tape/Copy should perform RACF authorization checking on the selected datasets.

If this field is set to **NO** or **NONE**, then no authorization checking is performed on the datasets.

If this field is set to **U=xxxxxxxx** (where xxxxxxxx is a valid user id) or **CURRENT** (the user id submitting the compare job), Tape/Copy will check the RACF authority of the user id to verify that this user has the authority to read/access the datasets being compared. Datasets that the user id does not have the authority to process will be rejected.

Compare Jobcard JCL:

Parameter: N/A

Default Value: N/A

Options: A standard JCL job card with a valid jobname and accounting information for your data center is required. Up to four JCL statements may be defined in this area. These statements will always be included as the first four JCL statements of each Tape Compare submitted through the ISPF panels job unless changed here by the user.

33 CopyCrypt (File Encryption Option)

Topics Covered In This Chapter

Introduction (page 33-2)

CopyCrypt Planning (page 33-2)

Encryption and Reblocking (page 33-6)

CopyCrypt Key Management (page 33-8)

CopyCrypt Key Database (KEYDB) (page 33-8)

Selecting CopyCrypt Encryption (page 33-24)

Defining CopyCrypt Rules (page 33-25)

Decrypting Data Encrypted by CopyCrypt (page 33-31)

Simulating Encryption for Testing Purposes (page 33-32)

Reports Generated by CopyCrypt Processing (page 33-32)

Introduction

As the need to create offsite backups of data has become a necessity, the risk of sending your data offsite has increased. Government policies and legal obligations make it not only wise, but also necessary to protect the data on your backup tapes containing sensitive financial, medical, and personal data from being read by unauthorized sources. The most secure way to protect your data is through encryption.

CopyCrypt is an add-on component to Tape/Copy and VDR, which interfaces with IBM's Integrated Cryptographic Service Facility (ICSF) to utilize the Cryptographic Co-processor available in most IBM mainframes. Using the IBM cryptographic facilities CopyCrypt can encrypt and decrypt data with maximum efficiency, using much less CPU time than with software-only encryption. Allowing ICSF to manage all encryption keys also prevents the user from having to maintain keys separately. CopyCrypt allows users to expand on all of the benefits provided by Tape/Copy and VDR, such as maximizing tape utilization and flexible selection criteria, while securing their data before offsite shipment.

CopyCrypt is able to request encryption for any data being processed by the Tape/Copy EXCP engine, and users have full control over which datasets are encrypted by defining rules similar to those used in the Co-Location feature for stacked tapes and the Output File Reblocking feature. Because encrypting data reduces the speed of tape copying, users can be selective and only encrypt the data that's most sensitive and can also select the level of encryption. The less-sensitive data can be copied "as is". Tape/Copy can stack encrypted and unencrypted datasets together on the same tape, and will process unencrypted and encrypted data together in the same conversion job.

Usage Considerations

Note Before implementing CopyCrypt for tape data encryption processing, please read this entire chapter of the Tape/Copy User Guide.

CopyCrypt Planning

The following topics are intended to help the user identify the options that will be used with CopyCrypt. There may be issues specific to the user's environment that are not addressed here. However, review of these topics will help begin the planning process for implementing CopyCrypt.

- Hardware vs. Software Encryption
- Key Management Options
- Encryption Algorithms (Strength of Encryption)
- Selecting Data to Encrypt
- Effects of Compression with Encryption
- Performance Effects of Encryption
- Encryption and Reblocking
- Using CopyCrypt with VDR

- Disaster Recovery Preparation

Hardware vs. Software Encryption

CopyCrypt supports both hardware encryption (with the use of IBM's Cryptographic Co-processor) and integrated software encryption (powered by RSA BSAFE from RSA Security, Inc.). The decision of whether to use IBM ICSF hardware or CopyCrypt software encryption (or whether a site will allow either to be used depending on certain conditions) is one of the first decisions that should be made during CopyCrypt implementation planning.

The following table shows a comparison of these two encryption methods. Choose the method that is the best fit for your environment.

IBM Cryptographic Hardware Encryption	CopyCrypt Software Encryption
IBM Cryptographic hardware required	No additional hardware required
Must use IBM ICSF key management (if IBM ICSF secure hardware-based key management is required)	Supports ICSF key management and CopyCrypt key management
Uses a separate co-processor, and less system processor resources	Uses system processor resources to do the encryption

Note Any reports produced when using the CopyCrypt software encryption feature will include the "CopyCrypt's Software Encryption is powered by RSA BSAFE".

Key Management Options

A very important part of encryption processing is key management. Without availability of the encryption keys, the encrypted data is unreadable, but the keys must also be adequately protected from unauthorized use. CopyCrypt has an integrated key management system that can be used with both hardware and software encryption. CopyCrypt also supports the use of IBM's Integrated Cryptographic Service Facility (ICSF) when using hardware encryption.

Encryption Method	Supported Key Mgmt	
	ICSF	CopyCrypt Key DB
IBM Hardware	Yes	Yes
CopyCrypt Software	No	Yes

Note More information about the CopyCrypt Key Database is available in "KEYDB Components and Logging Structure".

For users that choose to use hardware encryption and use ICSF key management, the following additional set up items must be completed before CopyCrypt is used:

- The started task for ICSF must be running and have a master password.
- The processors must be defined to ICSF.
- The ICSF load library must be in the System LINKLIST.
- The user will need to define key labels or key encryption keys (KEKs) to ICSF so they can supply the desired key labels or KEKs to CopyCrypt on a per dataset basis.
- CopyCrypt users will need to be given proper authority through RACF (or other security facility) to access ICSF. (More information on granting security access is listed below.)

Note For more information on the use of ICSF, please refer to documentation provided by IBM.

Security Authorization to Access ICSF

For RACF, READ access is require for RACF class CSFSERV (which is used to control access to ICSF services). The in-storage RACF profiles will need to be refreshed after the user or group is given the READ permission for CLASS(CSFSERV). If not properly authorized, the CopyCrypt job will receive an ICSF ERROR followed by RACF messages indicating “INSUFFICIENT ACCESS AUTHORITY”.

For security facilities other than RACF, please check with the security administrator to make sure the user id used to perform CopyCrypt functions is properly authorized.

Encryption Algorithms (Strength of Encryption)

CopyCrypt supports encryption using the following industry-standard encryption algorithms.

- DES
- DES1
- DES2
- DES3
- AES

CopyCrypt can assign different levels of encryption strength to different volumes, even when stacking backups together on the same backup tape. The level of security required for sensitive information being sent off site, as well as corporate or government requirements, should dictate the encryption algorithm used.

Selecting Data to Encrypt

CopyCrypt allows the user to specify simple “IF-THEN-ELSE” rules that determine which data should be encrypted during the conversion process. These rules apply to TapeCopy dataset or tape volume selection. The user can choose to encrypt only certain datasets or tape volumes, and can apply different encryption algorithms to different datasets or tape volumes resulting in the desired levels of data security with the lowest possible impact to system resources (you do not encrypt more data than is necessary).

Effects of Compression with Encryption

Because encrypted data has been randomized, encrypted data will not compact well if compressed by tape hardware as it is written to the output tape during the copy operation. In order to get the benefits of both encryption and compression, CopyCrypt can compress the data prior to the encryption process. This offers the following advantages:

- compressing the data prior to encryption will reduce the number of bytes to be encrypted, reducing the CPU time and elapsed time for the encryption operation
- compressed output data will use less space on the output tape

To use pre-encryption compression with CopyCrypt, use the COMPRESS-OUTPUT-DATA-BEFORE-ENCRYPTING set to YES, which is the default setting. Setting the COMPRESS-OUTPUT-DATA-BEFORE-ENCRYPTING to NO will turn off the pre-encryption compression.

The USE-TRTCH=NOCOMP-FOR-ENCRYPTED-FILES parameter controls whether the files that have been selected for encryption processing will be created with TRTCH=NOCOMP or if they will use TRTCH=COMP. If the USE-TRTCH=NOCOMP-FOR-ENCRYPTED-FILES parameter is set to YES, the backup volume sets that contain more bytes of data that will be encrypted than unencrypted bytes will be created with TRTCH=NOCOMP. If the USE-TRTCH=NOCOMP-FOR-ENCRYPTED-FILES parameter is set to NO (the default), the backup volume sets will be created with TRTCH=COMP.

Note Using TRTCH=COMP for encrypted files will cause the files to increase in size when written to the output tape. The Tape Conversion Forecast Report calculations will not be able to foresee this file size increase which may cause the output tape overflows and tape utilization percentages to be incorrectly reported.

Performance Effects of Encryption

Encrypting and decrypting data during conversion requires additional processing and more time than copying data without encryption processing. As such, using CopyCrypt during TapeCopy operations will slow down the rate at which data is copied. The rate of this decrease is dependent on many factors, including:

- whether the encrypted data was compressed prior to encryption
- the encryption algorithm or key strength used (DES, 3DES, AES128, AES256)
- the processing speed and workload of the cryptographic hardware, if used
- the number of cryptographic hardware co-processors available, if used
- the number of concurrent backup/recovery jobs

Note The EXCP Performance Report shows the elapsed time for compression, encryption, decryption, and expansion of data processed by CopyCrypt.

Encryption and Reblocking

During the encryption process, data being encrypted is reblocked. The encrypted output file blocksize will differ from the blocksize of the input file. The Conversion Report will show the input and output blocksizes.

When a candidate dataset matches both encryption rules and reblocking rules, encryption processing will take precedence. Any datasets that meet the qualifications for both CopyCrypt encryption AND Output File Reblocking (see Chapter 16) in their respective rules member will be processed by CopyCrypt and will be rejected from the separate Output File Reblocking process. The "Reblocking Status Report" will list "NO REBLOCK WITH ENCRYPTION, USING: NONE" as the status for these datasets.

Since Tape/Copy allows encrypted and unencrypted data to be copied to the same output tape, any unencrypted datasets on the same output tape can be reblocked according to the defined reblocking rules (if any). Reblocking settings are not "turned off" for the entire output tape if one dataset qualifies for encryption.

Using CopyCrypt with VDR

VDR users can incorporate CopyCrypt into their VDR backup and recovery processes. CopyCrypt can be used to encrypt data when creating the VDR Dual Copy backup tapes (as well as VDR duplex backup tapes). VDR can then decrypt the data during Copy Recovery from tape-to-tape or when recovering from tape-to-disk.

Note VDR users cannot use CopyCrypt to encrypt data on DASD during tape-to-disk recovery. Tape-to-disk recovery supports decryption of encrypted backup tapes, or copying unencrypted data "as is" only.

Disaster Recovery Preparation

Note The keys used to encrypt the data must be available at the DR site or the data can't be decrypted.

Users that have implemented CopyCrypt using the CopyCrypt Key Database for key management can use either the backup and restore utilities provided for the key database, or IDCAMS Repro to copy the database to the DR system. For specific backup/restore information using the CopyCrypt utilities, see "Backing up the CopyCrypt Key Database" and "Restoring the CopyCrypt Key Database".

For those using ICSF for key management, exporting the ICSF CKDS dataset to the DR site is recommended. Refer to your IBM ICSF documentation for the proper procedure to ensure the key database is available at the DR site.

If passwords (rather than encryption keys) were used to encrypt the data, then no keys are needed at the DR site. However, the password used to encrypt the file must be supplied when the file is decrypted.

CopyCrypt Parameter Summary

The table that follows provides a summary of the TapeCopy user parameters that are specific to CopyCrypt functionality, which you may want to be familiar with while planning your CopyCrypt implementation.

Note More detail on these options/functions are provided through the remainder of this chapter, and in the DBS Parameter Guide.

Parameter	Description
COMPRESS-OUTPUT-DATA-BEFORE-ENCRYPTING	determines whether data that is encrypted by CopyCrypt will be compressed before encryption.
ENCRYPTION-AUTO-GENERATED-KEY-STRENGTH	determines the encryption strength of the key to be generated during encryption when the CopyCrypt Key Database is being used. (If the ICSF CKDS is being used, DES3 is used.)
ENCRYPTION-FACILITY	specifies whether CopyCrypt should use IBM's Cryptographic hardware, or CopyCrypt's software encryption algorithms, for encryption/decryption functions.
ENCRYPTION-KEY-DATABASE	determines whether ICSF or CopyCrypt's key database will be used to retrieve labeled key values.
ENCRYPTION-RULE	determines if CopyCrypt will be used, and if so, whether the process is an encryption or a decryption operation.
KEYDB-DATASET-NAME	specifies the name of the CopyCrypt Key database, if using the CopyCrypt Key Database for key management.
KEYDB-LOG-GDG-BASE	specifies the name of the GDG base for the CopyCrypt Key database log (the "active" log), if using the CopyCrypt Key Database for key management.
KEYDB-NUMBER-OF-RECORDS	specifies the maximum number of keys that are expected to be in the CopyCrypt Key Database in order to determine the size of the database upon initialization, if using the CopyCrypt Key Database for key management.
SIMULATE-ENCRYPTION	determines whether CopyCrypt will perform encryption in "live" mode or in "simulate" mode.
SUPPRESS-ENCRYPTION-KEY-LABELS	controls whether encryption key labels and passwords are printed on the TapeCopy Reports pertaining to encryption.
USE-TRTCH=NOCOMP-FOR-ENCRYPTED-FILES	controls whether files that have been selected for encryption processing will be created with TRTCH=NOCOMP.

CopyCrypt Key Management

The user specifies whether to use IBM's ICSF or CopyCrypt's Key Database using the ENCRYPTION-KEY-DATABASE parameter. (Specify ENCRYPTION-KEY-DATABASE: ICSF or ENCRYPTION-KEY-DATABASE: CPYCRYPT).

This section discusses the setup requirements and usage of the CopyCrypt Key Database.

Note If using IBM's ICSF key management, please refer to documentation provided by IBM for key management information then proceed to "Selecting CopyCrypt Encryption" later in this chapter.

CopyCrypt Key Database (KEYDB)

The CopyCrypt Key Database (KEYDB) is a repository (VSAM KSDS file) that holds all encryption keys and control information used by CopyCrypt encryption and decryption processes. Because use of the CopyCrypt Key Database is optional (as some users will chose ICSF key management exclusively), the key database is not initialized during product installation and must be created after TapeCopy has been installed. The setup process for the CopyCrypt Key Database is included in this chapter.

Note While it is possible to create and use different CopyCrypt key databases, with different keys in each database, (a user parameter specifies the Copycrypt key database to be used for a given encryption/decryption job, allowing that) OpenTech Systems does not recommend using multiple key databases. If multiple databases are used extreme care must be taken to manage their use. The different databases should not have keys with the same label name. This note does not apply to copies of the same key database, with the same keys in them, at different locations.

The following is a list of main topics discussed in this chapter that pertain to the CopyCrypt Key Database:

- Creating the CopyCrypt Key Database
- The Master Key
- Adding Keys/Modifying the CopyCrypt KEYDB
- KEYDB Components and Logging Structure
- Backing up the CopyCrypt Key Database
- Restoring the CopyCrypt Key Database
- Securing the Key Database

Creating the CopyCrypt Key Database

To use the CopyCrypt Key Database, the database file must first be created and initialized using the KEYDBINI JCL in the JCLLIB. The KEYDBINI job uses IDCAMS to define a VSAM KSDS file and then populates the database with necessary control records. The database name is defined using the value of the KEYDB-DATASET-NAME parameter, and the size of the defined database is determined by the KEYDB-NUMBER-OF-RECORDS parameter value (which indicates the maximum number of keys/records expected to be

used in the database). The default is 12,000 user keys (which is 12,000 records - each record holds one key).

Note The number of keys a site will choose to put into the Key database depends entirely on how that site intends to use keys and varies greatly between companies. After the Key database is created that number can be increased by running an IDCAMS backup/restore with the Define of the new Key DB specifying a greater number of records, or using the CopyCrypt Backup/Restore with KEYDB-NUMBER-OF-RECORDS set to the larger value.

Edit the KEYDBINI member in the TapeCopy JCLLIB and update the JCL according to the instructions in the JCL comments, and submit the job to create and initialize the CopyCrypt KEYDB. Upon successful completion of this job, you can now supply CopyCrypt with a Master Key.

Init Database Report

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                          PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     INIT DATABASE REPORT FOR OPENTECH_SYSTEMS,INC.                                 PAGE     1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE   *
*                                                           *
*************************************************************

 KEY DATABASE: OT08.KEY.APRIL9.OT.KEY.DB                    SUCCESSFULLY DEFINED
 KEY DATABASE INITIALIZATION WAS SUCCESSFUL

NOTE: A MASTER KEY MUST STILL BE CREATED BEFORE THE DATABASE CAN BE USED
```

The Master Key

The master key is used to encrypt all of the other keys in the CopyCrypt Key Database to keep those individual keys secure.

Creating a Master Key

Once the CopyCrypt Key Database has been created and initialized, the next step is to create a master key. Creating the Master Key is a three step process:

- Step 1 - Generate three 16-byte random numbers
- Step 2 - Supply KEYDB with random numbers
- Step 3 - Create Initial Master key

Step 1 - Generate three 16-byte random numbers

The master key generation process uses three 16-byte random numbers supplied by the site. The third random number (designated as “RANDOM3”) can be all zeros, which means that effectively the key is generated from only the first two random numbers. The master key is formed by exclusive ORing the random numbers together. This allows the master key to be recreated if it becomes lost or corrupted, by re-supplying the same numbers used to create the master key initially.

Using multiple random numbers can be considered an additional security feature. It allows the three separate numbers to be given to three separate people, or kept in three separate locations, so that all three numbers (which can be used to recreate the master key) are not known to one single person or housed in one single location.

The KEYDBRAN member of the JCLLIB contains a job that can be used to generate three 16-byte random numbers at a time, in the format needed to supply the numbers to the CopyCrypt KEYDB. These numbers are generated by calls to RSA Security, Inc., software licensed by OpenTech Systems, Inc., for use in the CopyCrypt software. The KEYDBRAN program can be run multiple times, with one or more numbers used from each run to allow separation of knowledge of the random numbers by one or more people.

Note The use of the KEYDBRAN job is recommended, but not mandatory. CopyCrypt users can use other methods for generating these three 16-byte numbers if they choose.

If choosing to use it, edit the KEYDBRAN member of the JCLLIB library and update the JCL according to the instructions in the JCL comments, and submit the job to generate three random numbers.

Random Number Report

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     RANDOM NUMBER REPORT FOR OPENTECH_SYSTEMS,INC.                              PAGE      1

***************************************************************
*                                                             *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE    *
*                                                             *
***************************************************************

**USER CARD: MASTER +
**USER CARD: RANDOM1(33E56BF142D51BB526E4FD25D53DF914) CHKSUM1(72DD7DE0) +
**USER CARD: RANDOM2(87DF936D5301204D43DD0F4F3A9A91FD) CHKSUM2(59585507) +
**USER CARD: RANDOM3(D45C2EDEFE0A7DF05A9B55121061DAD8) CHKSUM3(3D63DCBA)
**USER CARD: MASTER CREATE
```

Step 2 - Supply KEYDB with random numbers

The next step is to provide the CopyCrypt Key Database with the three random numbers that were generated by the KEYDBRAN job in Step 1, or were obtained using alternate means. The third random number (and only random number 3) can be set to all zeros, in which case only the first two random numbers will be used to form the key.

In order to detect accidental keystroke errors when typing in the 16 byte (32 printable hex characters) random numbers, a 4-byte (8 character) checksum is required with each number for verification. If the KEYDBRAN job in Step 1 was used, the required checksum is listed in the Random Number Report along with the three numbers. Both the number and its checksum can be copied (“cut and paste”) from the Random Number Report and entered into the control cards used by KEYDBMS1.

If KEYDBRAN **was not** used to generate the random numbers, the user will be responsible for creating valid checksums for their chosen numbers. **The checksum must be created using the IBM z/Series CKSM instruction.** Checksums derived any other way might have a different value and will then be rejected.

An example of assembler code that can be used to create the checksum is given below:

```
                    XR     R1,R1              ZERO CKSM ACCUM REG
                    LA    R2,RANDOM_          NUMBER  ADDR OF NUM TO CKSM
                    LA    R3,16               SET NUMBER OF BYTES TO CKSM
DO_CKSM             CKSM  R1,R2               GET CHECKSUM
                    BNZ   DO_CKSM             LOOP IF MORE BYTES
                    ST    R1,SAVED_CKSM       SAVE CKSM
```

Caution If the checksum does not match when the KEYDBMS1 job is run, the random numbers will not be supplied to the key database.

If your site does not wish one person to have access to all three random numbers for security reasons, the KEYDBMS1 job may be run multiple times to add each random number separately.

Edit the KEYDBMS1 member of the JCLLIB library and update the JCL and control cards according to the instructions in the JCL comments, and submit the job to pass the random numbers to the key database. Repeat, if necessary (for multiple runs).

Master Key Report (CheckSum)

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     MASTER KEY REPORT FOR OPENTECH_SYSTEMS,INC.                                 PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE    *
*                                                           *
*************************************************************

 RANDOM NUMBER1 CHKSUM: F51F9703  ADDED
 RANDOM NUMBER2 CHKSUM: 7218C3E2  ADDED
 RANDOM NUMBER3 CHKSUM: CDE17C2F  ADDED

      **** STATUS OF THE 3 RANDOM NUMBERS REQUIRED TO CREATE/CHANGE MASTER KEY

 RANDOM NUMBER1: ENTERED  03/19/2007
 RANDOM NUMBER2: ENTERED  03/19/2007
 RANDOM NUMBER3: ENTERED  03/19/2007

  ALL THREE RANDOM NUMBERS ARE PRESENT. A MASTER KEY CAN BE CREATED/CHANGED
```

Step 3 - Create Initial Master key

Once all three random numbers have been supplied using the KEYDBMS1 job, job KEYDBMAS can be used to create the master key.

Please note that as shipped, the KEYDBMAS job has control cards in place for both creating and changing master keys. For the initial creation of the master key, only the “MASTER CREATE” control card should be used. An asterisk can be placed in column one to “comment out” the “MASTER CHANGE” control card, as shown below.

```
//SYSIN    DD *
*****************************************************************
*  CREATE A NEW MASTER KEY  (FIRST TIME ONLY)
*****************************************************************
   MASTER    CREATE
*****************************************************************
*  CHANGE THE EXISTING MASTER KEY  (ANY TIME AFTER CREATE OF 1ST)
*****************************************************************
*  MASTER    CHANGE             <---commented out
//*
```

Edit the KEYDBMAS member of the JCLLIB library and update the JCL and control cards according to the instructions in the JCL comments, and submit the job to create the initial master key.

Note It is recommended that a backup of the Key database be taken immediately after the master key is created. See “Backing up the CopyCrypt Key Database”.

Master Key Report (Create Key)

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                          PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     MASTER KEY REPORT FOR OPENTECH_SYSTEMS,INC.                                 PAGE      1

************************************************************
*                                                          *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE    *
*                                                          *
************************************************************

THE MASTER KEY HAS BEEN SUCCESSFULLY CREATED

  THE RANDOM NUMBERS USED TO CREATE THE NEW MASTER KEY WERE:

RANDOM NUMBER1: ENTERED  03/05/2007

RANDOM NUMBER2: ENTERED  03/05/2007

RANDOM NUMBER3: ENTERED  03/05/2007
```

Changing the Master Key

Some industries and regulations mandate how often a master key must be changed. After the master key has been created the first time it can be changed as needed following the same process as used for creating the initial key - with the following exception. The KEYDBMAS job should use the “MASTER CHANGE” control card rather than the “MASTER CREATE” control card that was used when the initial master key was created, as shown below.

```
//SYSIN    DD *
*****************************************************************
*  CREATE A NEW MASTER KEY  (FIRST TIME ONLY)
******************************************************************
*  MASTER    CREATE          <---commented out
******************************************************************
*  CHANGE THE EXISTING MASTER KEY  (ANY TIME AFTER CREATE OF 1ST)
******************************************************************
   MASTER    CHANGE
//*
```

After a new set of random numbers are supplied as in Step 1 and Step 2, edit the KEYDBMAS member of the JCLLIB library and update the JCL and control cards according to the instructions in the JCL comments, and submit the job to change the master key. The last phase of the master key process automatically takes a backup of the key database.

Note OpenTech Systems recommends that users check the status of the CopyCrypt key database prior to changing the master key. See “Validate and Report on the KEYDB” for more information.

Master Key Report (Change Master Key)

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  04/09/2007   TIME:  13:55:40     MASTER KEY REPORT FOR OPENTECH_SYSTEMS,INC.

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE   *
*                                                           *
*************************************************************

 FIRST PART OF MASTER KEY CHANGE WAS SUCCESSFUL. LAST PHASE ABOUT TO BEGIN

  THE RANDOM NUMBERS USED TO CREATE THE NEW MASTER KEY WERE:

RANDOM NUMBER1: ENTERED  04/09/2007

RANDOM NUMBER2: ENTERED  04/09/2007

RANDOM NUMBER3: ENTERED  04/09/2007

 ABOUT TO CALL OTUL3035 TO TAKE BACKUP OF THE KEY DATABASE

 OTUL3035 BACKUP OF KEY DATABASE COMPLETED SUCCESSFULLY

 LAST PHASE OF MASTER KEY CHANGE WAS SUCCESSFUL. MASTER KEY HAS BEEN CHANGED.

 THE NEW MASTER KEY VERSION NUMBER IS NOW:       8
```

Adding Keys / Modifying the CopyCrypt KEYDB

After the master key has been created, user keys can be added, as well as subsequently renamed, deleted, or expired. The KEYDBUPD member of the TapeCopy JCLLIB is used to add, delete, rename and expire keys. The job can contain multiple functions (can add and rename keys within the same job). Review this section for information about these functions and their required control card parameters.

There are three different kinds of user keys:

1. **Data encrypting/decrypting key** - This key used to encrypt user data (datasets). The valid types of data encrypting keys are: DES1, DES2, DES3, AES128, AES192, AES256.
2. **Key encrypting key** - This key is used to encrypt another key so that it can be transported. To add a key encrypting key specify "KEK". The strength of the key will be DES2.
3. **Password** - The CopyCrypt Key Database can also be used to hold 32-byte passwords that are retrieved using the key label. Passwords are converted into keys at the time of their use for encryption or decryption, using the SHA-1 algorithm. Passwords can be DES3, AES128 or AES256.

Note Passwords can also be supplied directly to the encryption/decryption processes, without storing them into the KEYDB.

Key Labels

Each key in the KEYDB is identified by a key label which is assigned by the user. This is a “user friendly” label for the key that is used to retrieve a key from the database when needed. The key label can be up to 64 characters in length. The valid characters for a key label are shown in the table below.

Valid Key Label Characters	
Alphabetic A - Z	"Dollar" sign $
Numeric 0-9	"At" sign @
"Pound" sign #	Period .

Adding a Key

To add a new key to the CopyCrypt Key Database, edit the KEYDBUPD member of the JCLLIB library and update the JCL and ADD control cards according to the instructions in the JCL comments, and submit the job to add the new key(s).

Control card parameter	Description
ADD	Add a new key
KEYLAB (or KL)	User label assigned to the key. Up to 64 characters, left-justified
KEYALG	Key algorithm (strength) - DES1, DES2, DES3, AES128, AES192, AES256, or KEK (for key encryption key)
VAL	****Not used if the encryption key is to be generated by CopyCrypt.*** This parameter is used only if an encryption key is being supplied in the clear or encrypted form. If supplying an encryption key, this parameter is entered as follows: First byte is a "C" for clear keys, "E" for encrypted keys Second byte is a comma "," Next is the full clear or encrypted key in HEX format
KEKLAB (or EL)	Label of an existing key encryption key already in the key database, that is to be used to decrypt the key if the key is passed in encrypted form.
PASSWORD	Actual password up to 32 characters in length.

Note All new keys added to the CopyCrypt key database (whether generated by CopyCrypt or supplied by the user using the VAL statement) are tested during the ADD process to make sure they are not "too weak". A key that is too weak does not offer sufficient encryption protection and, further, can not be used by the RSA Security, Inc. software licensed by CopyCrypt.

Control card example - Add Three New Keys

```
ADD KEYLAB(KEY11111)  KEYALG(DES1)
ADD KEYLAB(KEYAES128) KEYALG(AES128)
ADD KEYLAB(KEYPASS1)  KEYALG(AES128) PASSWORD(PASSWORDKEY)
ADD KL(ACCOUTING#KEY)  KEYALG(AES128)    +
VAL(C,A539B13D726A4B9D1763C54282E313B8)   <-- PASS KEY VALUE IN THE CLEAR
ADD KL(DR2KEY)  KEYALG(AES128)      KEKLAB(KEK#FOR#ENCRYPTED)  +
VAL(E ,A539B13D726A4B9D1763C54282E313B8)   <-- PASS KEY VALUE IN  ENCRYPTED FORMAT
```

Renaming a Key

The key rename function is used to change the key label name assigned to a key. To rename a key label in the CopyCrypt Key Database, edit the KEYDBUPD member of the JCLLIB library and update the JCL and RENAME control cards according to the instructions in the JCL comments, and submit the job.

Control card parameter	Description
RENAME	Change the label name of an existing key
KEYLAB (or KL)	Existing user label assigned to the key. Up to 64 characters, left-justified
NEWLAB (of NL)	New user label to assign to the key. Up to 64 characters, left-justified

Control card example - Rename a key

```
RENAME  KL(KEY55555555)   +
        NL(KEY66666666)
```

Expiring a Key

To expire a key in the CopyCrypt Key Database, edit the KEYDBUPD member of the JCLLIB library and update the JCL and EXPIRE control cards according to the instructions in the JCL comments, and submit the job.

Caution When a key is expired it can no longer be used for further encryption processing. However, the key will still be available for decryption processing.

Control card parameter	Description
EXPIRE	Expire an existing key label
KEYLAB (or KL)	Existing key label assigned to the key. Up to 64 characters, left-justified

Control card example - Expire a key

```
EXPIRE KL(KEYAES192)
```

Deleting a Key

To delete a key in the CopyCrypt Key Database, edit the KEYDBUPD member of the JCLLIB library and update the JCL and DELETE control cards according to the instructions in the JCL comments, and submit the job.

Caution Deleting a key must be done as a two-step process for safety purposes. The first DELETE process places the key in delete-pending status. If a second DELETE process is performed, the key is actually deleted. The two delete statements can be placed in the same job, or in separate jobs with the second job being run at any later time.

Caution Once a key is deleted from the key database, it can no longer be used to encrypt OR decrypt data! Use caution when deleting keys.

Control card parameter	Description
DELETE	Delete a key from the key database
KEYLAB (or KL)	Existing key label assigned to the key to be deleted. Up to 64 characters, left-justified

Control card example - Delete a key

```
DELETE KEYLAB(KEYAES256)   first time marks "delete pending"
DELETE KEYLAB(KEYAES256)   second time performs the actual delete
```

Printing Password Values

To request a print out of the actual value of password that resides in the key database, edit the KEYDBUPD member of the JCLLIB library and update the JCL and PRTPSW control cards according to the instructions in the JCL comments, and submit the job.

Control card parameter	Description
PRTPSW	Print a password from the key database
KEYLAB (or KL)	Existing key label assigned to the password. Up to 64 characters, left-justified

Control card example - Print Password Value

```
PRTPSW KEYLAB(KEYAES256)
```

Job Summary Report

The Job Summary Report is produced by the KEYDBUPD job to show the results of any additions or changes to the CopyCrypt KEYDB.

```
REL x.x.x  PTF x                                T A P E / C O P Y                                                    PROGRAM xxxxxxxx
DATE:  03/05/2007   TIME:  14:30:20    JOB SUMMARY REPORT FOR OPENTECH_SYSTEMS,INC.                                   PAGE       1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE    *
*                                                           *
*************************************************************

KEY ADDED   SUCCESSFULLY: KEY11111

KEY ADDED   SUCCESSFULLY: KEYAES128

KEY ADDED   SUCCESSFULLY: KEYPASS1

*********************************************************************

 KEYDB HEADER RECORD RE-WRITTEN AS PART OF SHUTDOWN PROCESSING

*********************************************************************
ADD     STATEMENTS SUCCESSFULLY PROCESSED:        3

EXPIRE  STATEMENTS SUCCESSFULLY PROCESSED:        0

DELETE  STATEMENTS SUCCESSFULLY PROCESSED:        0

RENAME  STATEMENTS SUCCESSFULLY PROCESSED:        0

RANDOM  STATEMENTS SUCCESSFULLY PROCESSED:        0

MASTER  STATEMENTS SUCCESSFULLY PROCESSED:        0

*********************************************************

  USER  STATEMENTS:        3
```

Validate and Report on the KEYDB

The KEYDBVAL member of the TapeCopy JCLLIB contains JCL for a job that will read the CopyCrypt key database verify that all CopyCrypt control records are present and check the validity of the control records and the user keys. Any errors are reported. The KEYDBVAL job also lists all of the user keys in the KEYDB, including the type of key, the date it was created, the last date it was used, and other historical information.

While its not necessary to schedule KEYDBVAL to run regularly, the job can be run whenever the user would like to check the status and correctness of the KEYDB or would like to list all of the keys (no clear key values are displayed in the report).

It is recommended that the KEYDBVAL job be run prior to making changes to the master key to make sure that there are no errors in the key database.

To run this key database validation and reporting job, edit the KEYDBVAL member of the JCLLIB

library and update the JCL according to the instructions in the JCL comments, and submit the job.

CopyCrypt Key Database Report (Validation Report)

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     COPYCRYPT KEY DATABASE REPORT FOR OPENTECH_SYSTEMS,INC.                PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE   *
*                                                           *
*************************************************************

  A VALID KEY DATABASE HEADER RECORD IS PRESENT
  HEADER RECORD LAST UPDATED: 04/12/07  10:04:01

  KEY DB LAST BACKED UP USING OT OTUL3035: 04/09/07  13:56:50
  KEY DB LAST BACKUP DATASET NAME: CPYCRYPT.KEY.DB.BKUP.G0003V00

  KEY DB LAST RESTORED OT OTUL3036: 04/09/07  11:21:57
  KEY DB LAST RESTORE DATASET NAME: OT08.KEYDB.BKUP.G0022V00

  THE MASTER KEY RECORD DOES NOT APPEAR TO HAVE ERRORS
  THE MASTER KEY VERSION NUMBER IS:       8
  MASTER KEY LAST UPDATED: 04/09/07  13:55:40

ALL KEY DATABASE CONTROL RECORDS WERE PRESENT
```

CopyCrypt Key Database Report (Key Listing Report)

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     COPYCRYPT KEY DATABASE REPORT FOR OPENTECH_SYSTEMS,INC.                PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE   *
*                                                           *
*************************************************************

 ******************************************************************************************************************
 *  "ERR"      - "ERR" : ERROR WITH THIS USER KEY
 *               SEE MESSAGES IN DBREPORT
 *  "PW"       - "P" IF KEY IS A PASSWORD
 *  "EX"       - "EX" IF KEY IS EXPIRED
 *  "DP"       - "DP" IF KEY IS DELETE PENDING
 *  "CR DATE"  - DATE KEY CREATED
 *  "LST DATE" - DATE KEY LAST USED
 *  "USE-E"    - TIMES KEY USED FOR ENCRYPTION
 *  "USE-D"    - TIMES KEY USED FOR DECRYPTION
 ******************************************************************************************************************
 ERR KEY LABEL ----------------------------------------------------+  TYPE  PW  EX  DP  CR DATE   LST DATE USE-E  USE-D

     EEEKEY                                                         DES1           DP  03/05/07  00/00/00     0     0
     KEK5                                                           KEK                03/05/07  04/12/07    11     5
     KEYAA                                                          AES128             03/05/07  04/12/07     2     1
     KEYAAA1                                                        DES3               03/27/07  04/10/07     1     0
     KEYAAA2                                                        DES3               03/27/07  00/00/00     0     0
     KEYAAA4                                                        DES3               03/27/07  04/10/07     1     1
     KEYBBA2                                                        DES3               04/02/07  00/00/00     0     0
     KEYBBA4                                                        DES3       EX      04/02/07  00/00/00     0     0
     KEYBBA5                                                        DES3               04/02/07  00/00/00     0     0
     KEYBBA6                                                        DES3               04/02/07  00/00/00     0     0
     KEYBBA7                                                        DES3               04/02/07  00/00/00     0     0
     KEYCC                                                          AES256         DP  03/05/07  04/12/07     1     1

LAST ADDED USERKEY: 12345678901234567890123456789012345678901234567 8
 ******************************************************************************************************************
            USER KEY TOTALS

        USER KEYS:        100
 ******************************************************************************************************************
        DES1 KEYS:          2
        DES2 KEYS:          1
        DES3 KEYS:         82
      AES128 KEYS:          6
      AES192 KEYS:          3
      AES256 KEYS:          5
        USER KEKS:          1
 ******************************************************************************************************************
    PASSWORD KEYS:          5
     EXPIRED KEYS:         14
 DELETE PEND KEYS:          6
     RENAMED KEYS:          7
 ******************************************************************************************************************
    OTUL3026 JOBS:         65
```

KEYDB Components and Logging Structure

In order to provide high availability of the Key database, all updates to the database are logged to a separate log file before being written to the database. In the event that it becomes necessary to restore the CopyCrypt Key Database from a backup, the key database log records can be applied to the backup in a “forward recovery” mode to restore the contents of the database.

There are four data set components of the KEYDB and its logging structure:

- KEY Database (KEYDB)
- KEYDB Log (Active Log)
- KEYDB Backup
- KEYDB Backup Log

KEY Database (KEYDB)

The KEYDB is the repository for all encryption key information. Generally, all encryption/decryption jobs use the same KEYDB. The database was created in “Creating the CopyCrypt Key Database” earlier in this chapter and is identified by the KEYDB-DATASET-NAME parameter.

Caution The integrity of the CopyCrypt Key Database is critical! Without access to the Key database, keys needed to decrypt already encrypted data may not be available - making the encrypted data unreadable and also preventing any new data from being encrypted.

Please make sure you read and understand this section so that proper steps are taken to ensure the availability of the key database.

KEYDB Log (Active Log)

The KEYDB Log is used to record all updates to the KEYDB. The KEYDB Log contains entries for all updates to the KEYDB that were made since the previous backup of the KEYDB. At any point in time, the KEYDB backup, the KEYDB log backup, and the KEYDB active log can be used to restore or recover the KEYDB. The KEYDB Log is referred to as the "active log" to distinguish it from the backup log.

Immediately before each KEYDB update, CopyCrypt writes a log record of the update to the KEYDB log. The KEYDB Log is a GDG with a maximum of 255 generation data group data sets. When the first log record is written, the log is started at generation 1 (G0001V00) of the active log. Each time a log record is written, the new log record is appended to the end of the log. When a log data set expands to its maximum number of extents, and the last extent fills, the log will typically receive either a D37 or E37 abend. CopyCrypt typically recovers from this abend, creates a new generation of the log, and proceeds using the new log file.

The KEYDB log is sized so that each generation of the log can hold the log records from at least one backup cycle. Each time a new log data set is created, an informational WTO message is issued. If the new generation number is greater than 0010, a "warning" message is issued to remind the user to backup the KEYDB and KEYDB log using the KEYDBBK job in the TapeCopy JCLLIB as described in “KEYDB Backup Log”. The job will end with a condition code of four (cc=04).

The record format of the KEYDB Log is sequential with fixed length records. The record format is a "log" format which consists of the raw KEYDB record with a 16-byte log prefix or header. The log header contains the date and time that the log record was written and an indicator of whether the KEYDB update was an add, a delete, or an update.

The log name is specified using the KEYDB-LOG-GDG-BASE parameter. The KEYDB Log is a GDG with a maximum of 255 generations. If this GDG expands to more than 255 generations, CopyCrypt will fail, as it will no longer be able to update the key database. Warning WTO messages are issued prior to this occurrence to alert the user that a backup is required.

Caution It is imperative that the KEYDB and KEYDB Log are backed up regularly as described in the “KEYDB Backup Log” section.

KEYDB Backup

The KEYDB Backup is a backup copy of the KEYDB. The format of the Database Backup is sequential, with fixed length records. The record format is an 'unload' format which consist of the raw KEYDB record with a 16-byte log prefix or header. The log header contains the date and time of the backup and an indicator that the record was created by an unload activity.

The KEYDB backup name is specified using the KEYDB-BACKUP-FILE-GDG-BASE parameter. The KEYDB Backup is a GDG with a maximum of 10 generations.

KEYDB Backup Log

The KEYDB Backup Log is a copy of the active log. The KEYDB Log is backed up along with the KEYDB when the KEYDBBK job is executed (see “Backing up the CopyCrypt Key Database”). The KEYDBBK backup job does not need to be executed twice to back up both files.

The log name is specified using the KEYDB-BACKUP-LOG-GDG-BASE parameter. The KEYDB Backup Log is a GDG with a maximum of 10 generations.

Backing up the CopyCrypt Key Database

Caution The KEYDBBK job should be scheduled to run on a regular basis, approximately once per week or according to the needs of your data center.

To back up the CopyCrypt Key Database to the KEYDB Backup and the Active Log to the Backup Log, edit the KEYDBBK member of the JCLLIB library, update the JCL according to the instructions in the JCL comments, and submit the job.

The following DD statements are dynamically allocated by the KEYDBBK backup job:

- KEYDB - The Database (KEYDB)
- KEYDBLOG- The Database Log (Active Log)
- KEYDBBKD- The Database Backup

- KEYDBBKL- The Database Log Backup

Caution Do not override these allocations unless directed by Technical Support.

KEYDB Backup Report

```
 REL x.x.x PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx
 DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     KEYDB BACKUP REPORT FOR OPENTECH_SYSTEMS,INC.                          PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE   *
*                                                           *
*************************************************************

  KEY DATABASE WILL BE BACKED UP TO: OT02.OTSCLM.KEYDB.BK.G0001V00
  BEGINNING BACKUP OF KEYDB TO THE KEYDB BACKUP FILE
  THE BACKUP OF THE KEYDB WAS SUCCESSFUL
   NUMBER OF KEYDB RECORDS COPIED TO BACKUP:         11

  ACTIVE LOG(S) WILL BE BACKED UP TO: OT02.OTSCLM.KEYDB.LOG.BK.G0001V00
  BEGINNING BACKUP OF ACTIVE LOG DATASET(S) TO THE BACKUP LOG FILE
  THE BACKUP OF THE ACTIVE LOG WAS SUCCESSFUL
   NUMBER OF ACTIVE LOG RECORDS COPIED TO BACKUP:          5

  BEGINNING DELETE OF ALL ACTIVE LOG GENERATIONS
  THE DELETE OF THE ACTIVE LOG WAS SUCCESSFUL


  BACKUP OF KEY DATABASE WAS SUCCESSFUL
```

Restoring the CopyCrypt Key Database

To restore the CopyCrypt Key Database from the KEYDB Backup and the Active Log from the Backup Log, edit the KEYDBRST member of the JCLLIB library, update the JCL according to the instructions in the JCL comments, and submit the job.

The JCL in the KEYDBRST member of JCLLIB can be used to restore the KEYDB. By default, job KEYDBRST will use the most recent Database Backup File generation and all Active Log File generations to restore the KEYDB to its current state. If the KEYDB exists at the time that job KEYDBRST is executed, job KEYDBRST will delete the KEYDB and completely rebuild it.

To restore a generation of the Database Backup File that was made earlier than the most recent backup, add a KEYDBBKD DD statement to the KEYDBRST JCL to specify an earlier generation of the KEYDB Backup, as shown in the DD statement below:

```
//KEYDBBKD DD DSN=OT.XXX.KEYDBBKD(-9),DISP=SHR
```

The above example will restore the -9 generation of the KEYDB Backup. Job KEYDBRST will also reapply all updates that were made to the KEYDB since the -9 generation of the KEYDB Backup was made. When a KEYDBBKD DD statement is added to the KEYDBRST JCL, the KEYDBRST job searches all generations of the KEYDB Log Backup and the Active KEYDB Log to find all key database updates that were made after the KEYDB Backup that is being restored and applies all of those updates to the restored key database. The KEYDBRST job can be run at any time to delete and reload the KEYDB.

Caution Job KEYDBRST cannot be executed while any other CopyCrypt jobs are accessing the KEYDB.

To restore the CopyCrypt Key Database from a KEYDB Backup, edit the KEYDBRST member of the JCLLIB library, update the JCL according to the instructions in the JCL comments, and submit the job.

The following DD statements are dynamically allocated by the KEYDBRST restore job:

- KEYDB - The Key Database (KEYDB)
- KEYDBLOG- The Database Log
- KEYDBBKD- The Database Backup
- KEYDBBKL- The Database Log Backup
- KEYDBWRK- A work file that exists for the life of the KEYDBRST job.

Caution With the exception of KEYDBBKD as documented above, do not override these allocations unless directed by Technical Support.

KEYDB Restore Report

```
 REL x.x.x  PTF x                                T A P E / C O P Y                                  PROGRAM xxxxxxxx
 DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     KEYDB RESTORE REPORT FOR OPENTECH_SYSTEMS,INC.                          PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE    *
*                                                           *
*************************************************************

  WORKFILE DATASET NAME: OT08.KEYDB.KEYDBWRK
  KEY DATABASE BACKUP FILE USED: OT08.KEYDB.BKUP.G0012V00
  BEGINNING COPY OF KEYDB BACKUP FILE TO THE WORK FILE
  KEYDB BACKUP SUCCESSFULLY COPIED TO WORK FILE
   KEYDB BACKUP: RECORDS COPIED TO WORK FILE:         65

 THE MOST CURRENT VERSION OF THE KEYDB BACKUP WAS USED, SO THE BACKUP LOG WILL NOT BE USED

  BEGINNING COPY OF ACTIVE LOG DATASET(S) TO THE WORK FILE
  ACTIVE LOG FILE(S) USED: OT08.KEYDB.LOG.G0001V00
  ACTIVE LOG RECORDS IN THIS GDG GENERATION:         18

  ACTIVE LOG SUCCESSFULLY COPIED TO WORK FILE
  TOTAL ACTIVE LOG RECORDS COPIED TO BACKUP:         18
  BEGINNING SORT OF KEYDB WORKFILE
  THE SORT OF THE WORK FILE WAS SUCCESSFUL

  BEGINNING DELETE REDEFINE OF KEY DATABASE
  KEY DATABASE DATASET NAME: OT08.KEY.MARCHY.OT.KEY.DB                    DID NOT EXIST, SO WAS NOT DELETED
  THE DELETE AND REDEFINE OF THE KEY DATABASE WAS SUCCESSFUL

  BEGINNING RELOADING RECORDS TO KEY DATABASE
  KEY DATABASE DATASET NAME: OT08.KEY.MARCHY.OT.KEY.DB
  THE KEY DATABASE WAS SUCCESSFULLY RESTORED FROM THE BACKUPS

      RELOAD PHASE TOTAL RECORDS READ:         83

  RELOAD PHASE DELETE RECORDS SKIPPED:          1
   RELOAD PHASE OLDER RECORDS SKIPPED:          6

     RELOAD PHASE ADD RECORDS WRITTEN:          9
  RELOAD PHASE UPDATE RECORDS WRITTEN:          3
  RELOAD PHASE UNLOAD RECORDS WRITTEN:         64

   RELOAD PHASE TOTAL RECORDS WRITTEN:         76

  BEGINNING UPDATE OF HEADER RECORD
  UPDATE OF THE HEADER RECORD WAS SUCCESSFUL

RESTORE OF KEY DATABASE WAS SUCCESSFUL
```

Testing the Restore/Recovery of the KEYDB

CopyCrypt allows users to test the recovery process for the KEYDB by using the JCL in the KEYDBCMP member of the JCLLIB to compare the original KEYDB with the recovered KEYDB. This process will verify that two CopyCrypt key databases are the same, except for header dates and other items that are expected to change.

To test recovery of the CopyCrypt Key Database and compare two key databases, edit the KEYDBRST member of the JCLLIB library, update the JCL according to the instructions in the JCL comments, and submit the job.

CopyCrypt Compare Key Databases Report

```
 REL x.x.x  PTF x                                T A P E / C O P Y                                          PROGRAM xxxxxxxx
 DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     COPYCRYPT COMPARE KEY DATABASES REPORT FOR OPENTECH_SYSTEMS,INC.          PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE   *
*                                                           *
*************************************************************

  KEY DATABASE1 DATASET NAME: OT08.KEY.MARCHX.OT.KEY.DB

  KEY DATABASE2 DATASET NAME: OT08.KEY.MARCHY.OT.KEY.DB

 THE RECORDS IN THE 2 DATABASES ALL MATCH. THE DATABASES ARE IDENTICAL
  DATABASE 1 HAS:         76  RECORDS
  DATABASE 2 HAS:         76  RECORDS
```

Securing the Key Database

As stated previously, the integrity and availability of the CopyCrypt Key Database is critical, as without a valid key database the keys needed to decrypt the encrypted data will not be available and the data will not be usable. For this reason, it is also important to restrict access to the key database to prevent unintentional or intentional corruption.

Caution OpenTech Systems recommends creating security rules using your Security Management Software (such as RACF) to protect the key database and associated CopyCrypt programs.

This section provides sample RACF commands that can be used to protect the CopyCrypt Key Database and the programs that manage the Key Database. These functions should be performed by your RACF administrator or other authorized personnel only.

Security Control of the Key Database

Add Group CopyCrypt as a group under SYS1 to grant access to the Database and Programs. CPYCRYPT is used as the RACF Group profile name in the example below. You can choose to use another name if desired.

```
ADDGROUP CPYCRYPT …… OWNER(SYS1) …… SUPGROUP(SYS1)
```

The CopyCrypt Key Database should be defined to your security system with a generic dataset profile and should be given a UACC of NONE.

```
ADDSD 'OT.TapeCopy..KEY.DB*' …… UACC(NONE) ……
OWNER(CPYCRYPT) …… DATA('CopyCrypt Key DB')
```

The CopyCrypt Key Database should only grant ALTER Access to the users that are given the authority to Create/Update/Manage the Master and User Keys.

```
PERMIT 'OT.TapeCopy..KEY.DB*' …… ID(uuuuuu) ……
ACCESS(ALTER)
```

(*uuuuuu* is the explicit userids or group(s) that will Control the CopyCrypt Key Database)

The CopyCrypt Key Database should only grant CONTROL Access to the user or group that will be executing CopyCrypt Encryption/Decryption Jobs.

```
PERMIT 'OT.TapeCopy..KEY.DB*' …… ID(uuuuuu) ……
ACCESS(CONTROL)
```

(*uuuuuu* is the explicit userids or group(s) that will Access the CopyCrypt Key Database and should include the userid that the production jobs run with)

Security Control of the Key Database Management Programs

The CopyCrypt Utility Programs OTUL* should be defined to your security system (RACF) with the PROGRAM profile and should be given a UACC of NONE.

```
RDEFINE PROGRAM OTUL* ADDMEM('OT.TapeCopy.LOADLIB'//
NOPADCHK) …… UACC(NONE) …… OWNER(CPYCRYPT)
```

The CopyCrypt Utility Programs OTUL* ALTER Access should be granted to the Users or Groups that have authority to Execute the CopyCrypt Management Programs.

```
PERMIT CLASS(PROGRAM)  'OTUL*' …… ID(uuuuuu) ……
ACCESS(ALTER)
```

(*uuuuuu* is the explicit userids or group(s) that will Control the CopyCrypt key database)

The CopyCrypt Utility Programs OTUL* UPDATE Access should be granted to the Production Job Userid(s) that have authority to Execute the CopyCrypt Management Programs.

```
PERMIT CLASS(PROGRAM)  'OTUL*' …….  ID(uuuuuu) …..
ACCESS(UPDATE)
```

(*uuuuuu* is the explicit userids or group(s) that will Control the CopyCrypt Key Database and should include the userid that the production jobs run with)

Caution Please refer to the z/OS V1R4.0 or higher Security Server RACF Security Administrator's Guide for more detailed information.

Selecting CopyCrypt Encryption

Once key management implementation steps are completed, CopyCrypt rules can be established. CopyCrypt processing is controlled by the Tape/Copy user parameter OUTPUT-FILE-ENCRYPTION. This parameter can be set in the Tape/Copy ISPF Conversion Job Parameters panel using the “Output File Encryption” field. This parameter is used to tell Tape/Copy whether or not it should encrypt the output files resulting from a Tape/Copy conversion job and define the level(s) of encryption.

If OUTPUT-FILE-ENCRYPTION is set to ASIS (default), then no encryption processing is performed and all of the candidates selected by the Candidate Selection process will be copied without writing encrypted data to the output tape.

If OUTPUT-FILE-ENCRYPTION is set to DECRYPT, datasets on the tape that have previously been encrypted by CopyCrypt will be decrypted when copied to the output media.

To allow more flexible methods for telling CopyCrypt which datasets to encrypt or decrypt, the OUTPUT-FILE-ENCRYPTION parameter also supports referral to a Tape/Copy PARMLIB member (prefixed in the parameter value by a “>” - such as OUTPUT-FILE-ENCRYPTION: >CRYPTRUL). When using a PARMLIB member as the OUTPUT-FILE-ENCRYPTION parameter value, the user can define multiple encryption rules in an “IF-AND-OR-THEN-DEFAULT” format to tell Tape/Copy which datasets to encrypt/decrypt and what encryption algorithm (DES, 3DES, AES) and the encryption key label or password to use for encrypting data.

Note The CRYPTRUL member of the Tape/Copy PARMLIB is provided as an example and contains comments regarding the format of the encryption rule entries, also described in this chapter.

Defining CopyCrypt Rules

The CopyCrypt Rules Table is used to identify the datasets for encryption when specified by the OUTPUT-FILE-ENCRYPTION parameter, in the Output File Encryption field of the Conversion Job Parameters ISPF panel, or in the COPYRCVY Encryption field on the VDR Dual Copy Recovery Selection panel. The CopyCrypt Rule table uses a simple IF - AND - OR - THEN - DEFAULT logic making the rules easy to define. Each line in a CopyCrypt Rule table may only specify one statement.

Each CopyCrypt Rule consists of:

- The **rule logic modifier** (IF, AND, OR), which may be sub-modified with the BY modifier, and **command verbs** (THEN, DEFAULT)
- The tape management system field **compare code** to be compared against.
- The **comparison operator** (EQ, NE, GT, etc.).
- The **comparison data or table name**. Comparison data can be specific character strings or character pattern strings for matching fields like dataset name (DSN) and creating job name (CJOB). It can also be a numeric date, a relative date or a keyword date for matching date field such as expiration date (EXPDT) and create date (CDATE).
- The **encryption settings** (used with THEN and DEFAULT command verbs). This value is used to identify the type of encryption to be performed on the backup dataset when a true condition is set for the IF, AND, OR statement set, and is also used to tell CopyCrypt which key label, key encrypting key (KEK), or password to use.
- Comparison data can be specific character strings or character pattern strings for matching fields like dataset name (DSN) and creating job name (CJOB). It can also be a numeric date, a relative date or a keyword date for matching date field such as expiration date (EXPDT) and create date (CDATE).

Note A more detailed description of the CopyCrypt rule table options are discussed on the next several pages of this chapter.

Example

```
EDIT OT.TAPECOPY.PARMLIB(CRYPTRUL) - 24.01 Columns 00001 00072
Command ===> Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 *      COMPARE COMPARE
000002 *RULE   FIELD  OP    DATA
000003 *----+ +-----+ -- +----------------------------------------+
000004  IF    DSN     EQ *DATA0001/
000005        THEN       K-KEK1
000006  IF    DSN     EQ *DATA0002/
000007        THEN       A-AES1
000008  IF    DSN     EQ *DATA0003/
000009        THEN       U-USER1
000010  IF    DSN     EQ *DATA0004/
000011        THEN       U-USER2
000012        DEFAULT    ASIS
****** **************************** Bottom of Data ****************************
```

Rule Logic Modifiers

The rule logic modifier is used to specify how the encryption or decryption rule statement is processed relative to the previous statement in the table.

IF, NEW, AND, OR Modifiers

If the rule logic modifier is **IF**, **NEW**, or not specified (blank), then the current statement becomes the first statement of a new encryption/decryption rule entry.

If the rule logic modifier is **AND**, this indicates that the previous statement and the current statement are part of the same rule and both statements must be "true" for a candidate to be assigned to this encryption/decryption rule entry.

If the rule logic modifier is **OR**, this indicates that the previous statement and the current statement are part of the same rule and either statement must be "true" for a candidate to be assigned to this encryption/decryption rule entry.

BY Sub-Modifier

The **BY** rule logic sub-modifier can be used with any of the rule logic modifiers or by itself (which is the same as when it is specified with **IF** or **NEW**). The **BY** sub-modifier is helpful in reducing the number of statements that must be coded in the CopyCrypt Rules table to create separate encryption or decryption groups because the user can provide a list of comparison criteria in the form of a table.

The **BY** sub-modifier requires that the comparison data is a table name (a member within the TapeCopy PARMLIB library) and it causes a different encryption/decryption group to be created for each entry in the table.

If the rule logic sub-modifier of **BY** is specified, any statements that follow the **BY** statement must begin a new rule group. Specifying a rule logic modifier of **OR** or **AND** on the statement following a **BY** statement will result in a warning messages and the **OR** or **AND** statement will be ignored.

THEN, DEFAULT Verbs

If the encryption or decryption rule created using the entries in this table is found to be "true", the **THEN** command verb can be used to specify the name of the desired encryption settings ("ASIS", "DECRYPT" or the key type and label) to use for datasets that match the "true" rule entry.

If a THEN command verb is not specified in association with the "true" encryption rule, the encryption value found in the **DEFAULT** command verb statement will be used (if any). Otherwise, no encryption is performed for the datasets matching that encryption rule.

Tape Management System Field Compare Code

The tape management system field compare code is used to identify which tape management system field Tape/Copy should compare with the user-defined comparison data.

Field Compare Code	Description
ACCTNUM	Account number
ATLID	Automated tape library name
BKCRYPT	VDR Backup Encryption Flag (Y/N) **(VDR CopyCrypt users only; used only during VDR Recovery)**.
CDATE	Creation date
CDDNAME	Creating DD name
CEXPDT	Calculated expiration date
CJOB	Creating job name
CPGM	Creating program name
CSTEP	Creating job step name
DSN	Dataset name
EXPDT	Expiration date
KBSIZE	Size of the file in kilobytes
LDATE	Last used date
LDDNAME	Last used DD name
LJOB	Last used job name
LPGM	Last used program name
LSTEP	Last used job step name
OUTCODE	Outcode / Vault ID / Location ID
VOLSER	First Volser of file

Comparison Operators

The following table provides a list of the comparison operands supported for encryption rule processing.

Comparison Operator	Description
EQ	Equal
NE	Not equal
GT	Greater than
LT	Less than
GE	Greater than or equal
LE	Less than or equal

Comparison Data

The valid formats for comparison data are character data, date values and Tape/Copy PARMLIB library members that contain character data or date values.

Character data can either be specific values or generic/pattern values (using valid OpenTech Systems wildcard standards - see Appendix A, “Wildcard Characters”). Character data is the expected data type when comparing the following tape management system fields$$double check:

ACCTNUM	CSTEP	LSTEP
ATLID	DSN	OUTCODE
CDDNAME	LDDNAME	VOLSER
CJOB	LJOB	

Date values can be:

- **Specific dates** - provided in Julian (yyyy.ddd) or Gregorian (mm/dd/yyyy) format.
- **Relative dates** - specified by a single numeric value and are calculated as a number of days from the current date.
- **Keyword dates** - used to specify the expiration value used for candidates that use special expiration criteria. The valid keyword date values are:

PERMANENT	UNKNOWN
CYCLECNTL	DATECNTL
FOREIGN	MOVEIMMED
LDATE	USERDATE
ELAPSEDDAYS	STATSDATE
CATLGDATE	CATALOG

Note Internally, Tape/Copy stores all keyword dates as a Julian date (9900.001 or higher). Therefore, if the EXPDT field value is less than 9900.001 it is considered a specific date expiration value.

Using a Table as Comparison Data

CopyCrypt Rule processing will also accept the name of a Tape/Copy PARMLIB member as the comparison data. The PARMLIB member should contain a table of character data or date values (as defined on the previous page). The PARMLIB member name should be prefixed by a '>' symbol to distinguish it from standard comparison data.

For example:

```
>CRYPTDAT
```

CRYPTDAT would need to be a member in the Tape/Copy PARMLIB library (or the name of a ddname within the candidate selection job stream).

If used as the comparison data for an IF, AND or OR statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and any datasets that match any of the entries will be selected for that encryption rule group. The entries in a member used for comparison data for IF, AND or OR should be in the form of a list. One entry per line, such as:

```
****** ***************************** Top of Data ******************************
000001 FILEA.PROD.LIST
000002 FILEB.PROD.LIST
000003 FILE*.WORK.LIST
****** **************************** Bottom of Data ****************************
```

Note Each entry in the PARMLIB member table will be part of the same encryption rule (all will receive the same type of encryption processing).

If used as the comparison data for a BY statement, then each entry in the PARMLIB member specified will be compared to the value of the compare field and each entry in the member will generate a separate encryption group. The entries in a member used for comparison data for BY sub-statements should be in the form of “comparison data1 THEN value1”, such as

```
****** ***************************** Top of Data ******************************
000001 FILEA.PROD.LIST  THEN  ASIS
000002 FILEB.PROD.LIST  THEN  DECRYPT
000003 FILE*.WORK.LIST  THEN  A-AESKEY1
****** **************************** Bottom of Data ****************************
```

Note Each entry in the PARMLIB member table will create a new rule ID (each will receive the individually specified encryption settings).

Encryption Processing Settings

The settings below are used to indicate the type of cryptographic processing CopyCrypt is to perform when the CopyCrypt Rule Table statement comparison is “true”.

For encryption processing, CopyCrypt supports key labels or passwords.

- If specifying a **key label**, the label can be any ICSF or CopyCrypt (depending on the key management facility being used by your data center) defined key label, up to 64-bytes in length. The key label is prefaced by a character (see chart below) indicating the type of key and kind of encryption to be performed.
- Using the **password option** is useful for generating encrypted files that will be shared, as only the password and the CopyDecrypt software (available free of charge from OpenTech Systems) is required to decrypt the data. If specifying a password, the supplied password can be any combination of alphabetic, numeric, and the following special characters; # (number or pound sign), $ (dollar sign), @ (at sign), and . (period). The *password* can be up to 32-bytes in length. The password is prefaced by "P-" and the type of encryption processing to use (3DES, A128, A256, or DECR for decryption), as shown in the table below.

Encryption Settings	Description
ASIS	No encryption or decryption processing is performed.
DECRYPT	Files that were encrypted by CopyCrypt will be decrypted during conversion.
D-***keylabel***	The selected file will be decrypted using the password identified by the key label value in the key database. (This only applies to files that were encrypted with a password that was supplied using the "P-" syntax (such as, P-A128-*password*) or via a label.)
K-***keylabel***	The selected file will be encrypted using an automatically generated key that is encrypted using the key encryption key (KEK) specified by the key label. When using this option, CopyCrypt will use the 3DES encryption algorithm.
A-***keylabel***	The selected file will be encrypted using the AES encryption algorithm and the key specified by the key label value.
U-***keylabel***	The selected file will be encrypted using the DES encryption algorithm and the key specified by the key label value. (The key label value will also determine is DES or 3DES will be used.)
P-3DES-***password***	The selected file will be encrypted using the 3DES encryption algorithm and the specified password.
P-A128-***password***	The selected file will be encrypted using the AES 128-bit encryption algorithm and the specified password.
P-A256-***password***	The selected file will be encrypted using the AES 256-bit encryption algorithm and the specified password.
P-DECR-***password***	The selected file will be decrypted using the same encryption algorithm that was used to create the file and the specified password.
P-A256-***password***	The selected file will be encrypted using the AES 256-bit encryption algorithm and the specified password.

Decrypting Data Encrypted by CopyCrypt

CopyCrypt will only decrypt files that were encrypted by CopyCrypt. Other files encrypted by the same standard algorithms (DES, 3DES, AES) cannot be decrypted by CopyCrypt because they lack the specific proprietary information that CopyCrypt needs to determine how the data was encrypted.

To decrypt the CopyCrypt encrypted data, the user needs to change the OUTPUT-FILE-ENCRYPTION to DECRYPT, or provide a PARMLIB member containing a Rules Table with entries to cause decryption. This parameter can be set on the Conversion Job Parameters ISPF panel using the "Output File Encryption" field.

VDR users that want to decrypt files during Dual Copy Recovery can set the OUTPUT-FILE-ENCRYPTION parameter using the COPYRCVY Encryption field on the VDR Dual Copy Recovery Selection Panel when building their recovery JCL.

Caution As stated in "Disaster Recovery Preparation", the keys used during encryption must be available at the DR site or other alternate location in order for the encrypted tapes to be decrypted.

When passwords are used (rather than encryption keys) there are two distinct cases:

- passwords supplied directly to the encryption/decryption program
- passwords that reside in the Copycrypt Key database, which are referred to by label, just like true keys stored in the key database

For passwords supplied directly to the encryption/decryption program no key database is used.

For passwords stored in the Copycrypt Key database, the same rules apply as to keys: If they are to be used for encryption or decryption they must reside in the key database used at the time of encryption or decryption.

The CopyCrypt password feature allows passwords to be supplied using either method, and a different method can be used for encryption of a file and for its decryption. If a file will be encrypted using a password stored in the CopyCrypt Key database but decrypted with that same password supplied directly, then the password need only be in the key database used during encryption.

Caution Tape data encrypted by CopyCrypt is in a proprietary format and cannot be decrypted by any other utility.

Caution A utility called CopyDecrypt is available for free, which can be provided to the business partners of CopyCrypt customers (or anyone the customer has a need to share encrypted data with). See "CopyDecrypt User Guide" for more information on this utility.

Simulating Encryption for Testing Purposes

To provide users with a means of testing CopyCrypt's general functions without invoking actual cryptographic facilities, CopyCrypt is able to run in "simulate" mode using the parameter SIMULATE-ENCRYPTION. This allows a site to test CopyCrypt without going through all of the customization and setup required for performing real encryption.

When SIMULATE-ENCRYPTION is set to YES, CopyCrypt will use a simple algorithm to simulate encryption/decryption. The algorithm predictably scrambles data when encrypting and allows decryption to recover the original data. Any datasets encrypted using simulation mode will be decrypted using simulation mode automatically.

In simulation mode, it is the encryption/decryption processing that is "simulated" not the copy operation. The data is still copied from the input tape to the output media, as in a "live" job and all reports are still generated. When SIMULATE-ENCRYPTION is set to YES, a WTO will be issued and a condition code of 4 will be set to alert the user that only simulated encryption is being performed.

Caution SIMULATE-ENCRYPTION: YES should ONLY be used for testing purposes. The method of encryption used in simulate mode is NOT SECURE and should not be used as a means to protect data with encryption.

Reports Generated by CopyCrypt Processing

Since CopyCrypt uses the same Candidate Selection and Conversion processes as standard Tape/Copy jobs (as well as VDR for those users encrypting their Dual Copy backups), regular Tape/Copy and VDR Reports are generated. However, CopyCrypt jobs will also generate the additional reports that are listed in this section.

Rules Processor Report

The Rules Processor Report is produced during the Candidate Selection process and written to DD RULESRPT. This report serves as a cross reference between the user-defined encryption Rules table and the Tape/Copy generated Rule ID's.

Note The Rules Processor Report is also generated for other “rules processing” features, such as Co-Location. A section will be printed for each rules processing function that is in effect when the Candidate Selection job runs.

The Rules Processor Report will not list the statement specified by a BY rule logic sub-modifier. It will list the rules that were generated based on the BY statement and the contents of the table it specified.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx         RULES PROCESSOR REPORT FOR TABLE: CRYPTRUL FOR OPENTECH_SYSTEMS_INC.        PAGE     1

+  RULE   +          COMPARE
+---ID----+          +FIELD+     +-----------------COMPARE DATA-----------------+
          1  IF      DSN      EQ *DATA0001/
             THEN    K-KEK1
          2  IF      DSN      EQ *DATA0002/
             THEN    A-AES1
          3  IF      DSN      EQ *DATA0003/
             THEN    U-USER1
          4  IF      DSN      EQ *DATA0004/
             THEN    DECRYPT
             DEFAULT ASIS
```

By default, this report displays the entire encryption setting value as defined in the rules table, and includes the key label or label of the key encrypting key (KEK). If you do not want these key labels to be displayed, modify the setting of the SUPPRESS-ENCRYPTION-KEY-LABELS parameter to “YES” so that the encryption key labels will not be displayed.

Encryption Status Report

If the OUTPUT-FILE-ENCRYPTION parameter value is set to a Tape/Copy PARMLIB member (such as, >CRYPTRUL) which contains user-defined encryption rules, an Encryption Status Report is produced to show each dataset/volser and the encryption rule that applies to it.

By default, this report displays the entire encryption setting value as defined in the rules table, and includes the key label or label of the key encrypting key (KEK). If you do not want these key labels to be displayed, modify the setting of the SUPPRESS-ENCRYPTION-KEY-LABELS parameter to “YES” so that the encryption key labels will not be displayed.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                    PROGRAM xxxxxxxx

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx         ENCRYPTION STATUS REPORT FOR OPENTECH_SYSTEMS_INC.                        PAGE     1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE    *
*                                                           *
*************************************************************

DATASET NAME                                FSEQ# VOLSER RULE# ENCRYPTION SETTING

OT.APPLA.SZ14.DATA0001.SFSV.DATASET             1 001300     1 K-KEK1
OT.APPLA.SZ14.DATA0002.SFMV.DATASET             1 001301     2 A-AES1
OT.APPLA.SZ14.DATA0004.MFSV.FILE01              1 001326     4 U-USER2
OT.APPLA.SZ14.DATA0004.MFSV.FILE02              2 001326     4 U-USER2
OT.APPLA.SZ14.DATA0004.MFSV.FILE03              3 001326     4 U-USER2
OT.APPLA.SZ14.DATA0004.MFSV.FILE04              4 001326     4 U-USER2
OT.APPLA.SZ14.DATA0004.MFSV.FILE05              5 001326     4 U-USER2
OT.APPLA.SZ14.DATA0004.MFSV.FILE06              6 001326     4 U-USER2
OT.APPLA.SZ14.DATA0004.MFSV.FILE07              7 001326     4 U-USER2
OT.APPLA.SZ14.DATA0001.SFSV.DATASET             1 001365     1 K-KEK1
OT.APPLA.SZ14.DATA0002.SFMV.DATASET             2 001365     2 A-AES1
OT.APPLA.SZ14.DATA0003.SFMV.DATASET             3 001365     3 U-USER1
```

Conversion Job Encryption Report

The Conversion Job Encryption Report is generated for all jobs performing encryption/decryption processing.

- **Input Dataset Name** - The name of the dataset being processed with encryption or decryption.

- **E/D** - Specifies the action being performed (encryption or decryption)
- **ALG** - Specifies the key strength/algorithm
- **KEY** - This field lists the type of encryption key or password.
- **LABEL** - This is the label of the key or key encrypting key or password, or indicator that the value was suppressed by user. The maximum length is 64-characters for a key label; 32-characters for a password.
- **D/F** - Specifies the encryption key management and facility used.
- **Comp %** - The percent the file was compressed.

```
 REL x.x.x  PTF x                                    T A P E / C O P Y                                                PROGRAM xxxxxxxx
 DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION JOB ENCRYPTION REPORT FOR OPENTECH_SYSTEMS_INC                        PAGE      1

*************************************************************
*                                                           *
*  COPYCRYPT'S SOFTWARE ENCRYPTION IS POWERED BY RSA BSAFE  *
*                                                           *
*************************************************************

 ************************************************************************************************************************
 *  "E/D" FIELD: ENC IS ENCRYPTION, DEC IS DECRYPTION
 *  "ALG" FIELD: KEY STRENGTH
 *       D1 = DES1, D2 = DES2, D3 = DES3, D? = DES?
 *       A1 = AES128, A2 = AES192, A3 = AES256, A? = AES?
 *  "KEY" FIELD: KEY TYPE
 *     AUTO - COPY/CRYPT GENERATED THE KEY:              DES3 KEY
 *     USER - USER PROVIDED THE LABEL OF THE KEY TO USE: DES KEY
 *     UAES - USER PROVIDED THE LABEL OF THE KEY TO USE: AES KEY
 *     PDE3 - USER PROVIDED PASSWORD TO USE, DES3
 *     PA12 - USER PROVIDED PASSWORD TO USE, AES128
 *     PA25 - USER PROVIDED PASSWORD TO USE, AES256
 *  "D/F" FIELD: D IS KEY DB USED   - "I" ICSF CKDS
 *                                  - "C" COPYCRYPT KEY DATABASE
 *                                  - "P" PASSWORD (NO KEY DATABASE USED)
 *              F IS FACILITY USED - ICSF OR SOFTWARE
 *                                   U IF SIMULATED
 *  "COMP%" FIELD: PERCENT DATA WAS COMPRESSED IF ENCRYPTION, OR N/A
 ************************************************************************************************************************

 INPUT DATASET NAME (TAPE) -----------------+ E/D ALG KEY  LABEL OF KEY TO USE OR ACTUAL PASSWORD-----------------------+  D/F COMP%

 OT.CRYPT.FB11000                             ENC  A2 UAES KEY#AES192                                                      C S  96

 JOB END SUMMARY FOR DATASETS ENCRYPTED/DECRYPTED

               DATASETS ENCRYPTED:       1
               DATASETS DECRYPTED:       0
                   KEYS GENERATED:       0
                    KEYS PROVIDED:       1
                       (USER DES):       0
                       (USER AES):       1
                    KEYS PASSWORD:       0
                  (PASSWORD DES):        0
                  (PASSWORD AES):        0

      AVERAGE COMPRESSION PERCENT:      96
```

Caution By default, this report displays the key label or password used for encryption or decryption. If you do not want this information to be displayed, modify the setting of the set the SUPPRESS-ENCRYPTION-KEY-LABELS parameter to “YES” in the USERSETS member of the TapeCopy PARMLIB.

Copy Report

The Copy Report displays the results of the encryption or decryption operation, including the input dataset name or source and the output dataset name and volser (if successful).

Successful Copy and Encryption Operation Results

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     COPY REPORT FOR OPENTECH_SYSTEMS_INC                                       PAGE      1


  DFDSS REQUEST NUMBER:     1
           INPUT DATASET NAME: INPUT DATA CAME FROM DFDSS
          OUTPUT DATASET NAME: OT10.TDBS2101.DKDBSN41.D2006303.T170827
              FIRST 5 VOLSERS: 001376

  THE ENCRYPTION AND WRITING OF DFDSS DATA WAS SUCCESSFUL



  DFDSS REQUEST NUMBER:     2
           INPUT DATASET NAME:   INPUT DATA CAME FROM DFDSS
          OUTPUT DATASET NAME: OT10.TDBS2101.DKDBSN42.D2006303.T170828
              FIRST 5 VOLSERS: 001376

  THE ENCRYPTION AND WRITING OF DFDSS DATA WAS SUCCESSFUL
```

If the CopyCrypt job was not able to perform the request function, this report will simply state that the operation was unsuccessful. The user should examine the JES job log for message that indicates the reason the operation was unable to complete.

Unsuccessful Copy and Decryption Operation Results

```
REL x.x.x  PTF x                                        T A P E / C O P Y                                    PROGRAM xxxxxxxx
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     COPY REPORT FOR OPENTECH_SYSTEMS_INC                                       PAGE      1


THE ENCRYPTION AND WRITING OF DFDSS DATA WAS UNSUCCESSFUL. SEE ERROR MESSAGES IN THE LOG FOR DETAILS
```

EXCP Performance Report

The EXCP Performance Report is generated by each Tape/Copy EXCP conversion job. (See ""EXCP Analysis and Performance Reports"" in Chapter 13 for a full description of the standard detail lines on the report.)

When CopyCrypt encryption or decryption is used, additional statistics are displayed to show the elapsed time for compression, encryption, decryption, and expansion of data processed by CopyCrypt. An informational message will be displayed at the top of the report to indicate that encryption or decryption was performed by this conversion job, causing the block sizes and block counts of the input and output datasets to differ.

Example (showing compression and encryption)

```
EXCP ANALYSIS AND PERFORMANCE DETAIL REPORT
DETAIL REPORTS WILL BE CREATED FOR THE FIRST FIVE DATASETS COPIED ONLY


ENCRYPTION/DECRYPTION WAS REQUESTED IN THIS JOB. BLKSIZES AND COUNTS OF THE ENCRYPTED
DATASET WILL NOT MATCH THOSE OF THE ORIGINAL DATASET DUE TO PROPRIETARY FORMAT USED.


        OUTPUT DATASET NAME: OT10.TDBS2101.DKDBSN41.D2006303.T170827
        OUTPUT FIRST VOLSER:                      001376
 NUM OF BLOCKS READ/WRITTEN:           38               5
 LARGEST BLOCK READ/WRITTEN:        65520           18816
SMALLEST BLOCK READ/WRITTEN:           22             297
       NUMBER OF BYTES READ:                    1,247,488
    NUMBER OF BYTES WRITTEN:                       30,366
TIME SPENT COMPRESSING DATA: 00 HOURS 00 MINS 00.046 SECS       27.119 MB/SEC
 TIME SPENT ENCRYPTING DATA: 00 HOURS 00 MINS 00.002 SECS       14.609 MB/SEC
 PHYSICAL COPY ELAPSED TIME: 00 HOURS 00 MINS 00.402 SECS
 PHYSICAL COPY MB(READ)/SEC:                 3.103 MB/SEC
PHYSICAL COPY MB(WRITE)/SEC:                  .075 MB/SEC


        OUTPUT DATASET NAME: OT10.TDBS2101.DKDBSN42.D2006303.T170828
        OUTPUT FIRST VOLSER:                      001376
 NUM OF BLOCKS READ/WRITTEN:           53               7
 LARGEST BLOCK READ/WRITTEN:        65520           17184
SMALLEST BLOCK READ/WRITTEN:           22             297
       NUMBER OF BYTES READ:                    1,746,496
    NUMBER OF BYTES WRITTEN:                       44,167
TIME SPENT COMPRESSING DATA: 00 HOURS 00 MINS 00.083 SECS       21.042 MB/SEC
 TIME SPENT ENCRYPTING DATA: 00 HOURS 00 MINS 00.002 SECS       21.346 MB/SEC
 PHYSICAL COPY ELAPSED TIME: 00 HOURS 00 MINS 00.448 SECS
 PHYSICAL COPY MB(READ)/SEC:                 3.898 MB/SEC
PHYSICAL COPY MB(WRITE)/SEC:                  .098 MB/SEC
```

Note Each primary and secondary cylinder allocated will hold 6300 print lines or 105 pages @ 60 lines per page.

- Field 7 – Volume Count (range 1 - 59)
- Field 8 – SMS Data Class name or the word: NONE
- Field 9 – SMS Mgmt Class name or the word: NONE
- Field 10 – SMS Stor Class.name or the word: NONE

34 Library Management Utilities

Topics Covered In This Chapter

Introduction (page 34-2)

Recovering Overwritten Datasets (page 34-2)

Tape Browse Panel Option (page 34-6)

Erase Tape Utility (page 34-10)

Certify and Label Tape Utility (page 34-12)

Demand Erase to End of Tape Utility (page 34-16)

Introduction

Note The Library Management Utilities are an "add-on" feature to the base Tape/Copy product.

Recovering Overwritten Datasets

Tape/Copy allows users to attempt to recover tape datasets that were on a tape that has been overwritten. Any previously existing data that was physically written over cannot be recovered. However, any data that exists past the end of the newly written data may be recoverable.

To attempt to recover an overwritten dataset, the user specifies the name of the dataset that currently resides on the tape (the dataset that has overwritten the dataset the user wishes to recover) in the recovery job JCL.

After opening the input file, Tape/Copy positions the tape to the physical End of Data marker (EOD). This marker is past the second tapemark of the two tapemarks that indicate end of used tape and is past the newly written data - at the point where the first block of "residual" (previously written data from before the tape was re-used) recoverable data is located. Tape/Copy will then attempt to get to the very first recoverable block past EOD using IBM and STK proprietary methods.

In some cases, the tape will get constant unit check conditions when past EOD indicating that the data can't be recovered.

However, if a data block can be read successfully, Tape/Copy will forward to past the tapemark at the end of that file in order to read the two trailer labels (EOF1/2 or EOV1/2). From trailer label 1 it will get the last 17 characters of the dataset name of the old file. If the last 17 characters of the dataset name of the dataset to be recovered is specified in the recovery JCL (optional), Tape/Copy will compare the last 17 characters of the dataset name from the trailer label to the user specified value and will terminate the job if the values do not match. In this case the user can still view the input tape label information and make adjustments to the last 17 characters in the recovery job JCL if needed in order to recover the dataset.

From trailer label 2, Tape/Copy obtains the DCB information for the input dataset. These attributes will be used when creating the output dataset. Retrieving the DCB information from the label, rather than having it specified by the user in the recovery JCL, eliminates the risk of user error and prevents the user from having to locate the correct DCB information manually and prevents the user from specifying it incorrectly, rendering the recovered file unusable.

Note It can be difficult to anticipate before the job is executed which of the old files that were overwritten will be the first recoverable file, i.e. which file past EOD will contain the first recoverable block, even when using block counts and block sizes of the residual and new files. Tape compression of data and other considerations make it almost impossible to pinpoint with 100% accuracy the name of the first recoverable file.

In addition, it is possible that the first recoverable file could be a residual file from more than one previous use of the tape.

For these reasons, it may be necessary to execute the recovery job more than once, adjusting the settings of the last 17 characters of the dataset name in the recovery JCL control cards after viewing the tape labels displayed by the first run of the job.

After successfully processing the trailer label information (performed only for the very first file to be recovered), Tape/Copy will reposition the tape backward to the first recoverable block it read and Open the output file using the DCB information retrieved from the trailer label and the dataset name provided in the first DSN= control card in the recovery JCL. All the blocks from the first recoverable block to the end of the first recoverable file will be written to the output dataset. A message will report how many of the original blocks of that file were lost (unrecoverable due to having been overlaid by the newer file). Note that only the very first recovered file can have lost blocks.

After recovering all recoverable blocks from the first recoverable file, the process is repeated for each new file to be recovered. For these subsequent recoveries, the DCB information is obtained from the next input file's header labels, not trailer labels. No additional verification of the dataset name last 17 characters are performed. The last 17 characters from each input dataset label are printed along with each recovered dataset in the Recover Overwritten Datasets Report so the user can verify the file that was recovered.

The recovery program terminates when encountering any of the following conditions:

- The last output dataset specified in the DSN= cards was successfully recovered
- The input tape has reached EOD a second time
- EOV is encountered, meaning the current dataset being recovered spans to another volume (that volume is assumed to be scratched also now)
- Any I/O error besides the I/O errors always encountered when getting past EOD for the first time

Recovery Considerations

- This feature is only supported on IBM 3590 and up tape drives and most native STK tape drives. IBM 3490 or earlier drives do not support the use of this feature. Because logical volumes created by virtual tape systems do not retain residual data previously written to the volume, this feature cannot be used to recover data from overwritten virtual tape volumes.
- All output datasets recovered will be stacked onto the output tape(s).
- No volume spanning of the input tape will be done as part of recovery. If EOV is detected the job will stop since it is assumed that either the next tape(s) are scratched and also possibly written over, or they can be manually cataloged to the recovered dataset.
- The Recover Overwritten Dataset feature cannot skip over some of the recoverable datasets and start with a particular dataset further on the tape. All recoverable datasets will be written to the output tape, until a second EOD is detected or the user DSN= cards have run out.
- No option is given to control the cataloging of the output dataset(s) other than the JCL disposition. The user can manually catalog the recovered datasets after the job ends.

Recovery Job JCL

The JCL for the job to recover overwritten datasets is located in the TCSTATS member of the Tape/Copy JCL library.

The TAPEIN DD is used for the input tape (the tape that was overwritten). The user only needs to provide enough input information on the TAPEIN card to allow the tape to be opened using a normal Open macro. Generally, the dataset name of the file that was last written to the tape (not the name of the dataset to be recovered), and LABEL=(1,SL). The user does not need to specify BLP (Bypass Label Processing) or attempt to specify the relative label position of the first file to recover; positioning to the first block past EOD is automatic. This allows full tape management system and MVS verification of the input tape.

The TAPEOUT DD is used to identify the output tape. The dataset name and DCB information supplied on the TAPEOUT DD will not be used by Tape/Copy. The DCB attributes obtained from the tape labels of the input tape will also be used for the output tape, and the dataset name(s) used for the recovered files are supplied using the DSN= control card(s).

Control Cards

The following SYSIN control cards are used by the TCSTATS job.

Control Card	Status	Description
LAST17=	Optional	If this control card is specified, it must be the first control card listed in the SYSIN DD. This control card allows the user to specify the last 17 characters of the first file to be recovered. When supplied, Tape/Copy will compare the last 17 characters of the dataset name from the trailer label (EOF1/EOV1) to the value specified in the LAST17= statement. If the last 17 characters do not match the job is terminated and the data is not recovered. This allows users to verify that the first recoverable dataset is indeed the dataset that they wish to recover. If the user does not provide a LAST17= card, this verification is not performed.
DSN=	Required	There must be at least one DSN= card. The first DSN= card supplies the output dataset name to be used for the first output tape dataset (on TAPEOUT). Each subsequent DSN= card specifies the next output tape dataset name to be used (in the case where multiple datasets are to be recovered from the overwritten input tape).

Recover Overwritten Datasets Report

The first part of the Recover Overwritten Dataset Report provides a chronology of the events and results that occurred while trying to recover one or more datasets from the input tape. It lists actions taken, errors encountered and the results of recovery operations.

The relevant sets of tape labels are displayed and can be used to confirm that the desired files are the ones that were recovered.

Note Since the first file is typically a partial file (the beginning of the file is usually overlaid when the tape was written over), a message is written showing how many data blocks were lost. This figure is computed by subtracting the number of blocks recovered from the original block count stored in the trailer label.

The last part of the Recover Overwritten Datasets Report is a summary listing all the datasets that were recovered from the input tape. Of note, the last 17 characters from the labels of each of the recovered files is displayed along with the recovered file, so the user can see which input file was recovered and make sure it was the one expected.

```
REL x.x.x  PTF x                                    T A P E / C O P Y                                                    PROGRAM XDCCALLA
DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     RECOVER OVERWRITTEN DATASETS REPORT FOR OPENTECH_SYSTEMS_INC.                        PAGE      1

   TRAILER LABELS FOLLOW - AT END OF 1ST INPUT DATASET TO RECOVER
   WILL BE USED FOR LAST17 CHECK AND DCB ATTRIBUTES FOR 1ST OUTPUT DATASET

EOF1OT.TAPE.IN1      00117600010001      0072620000000000711IBM OS/VS 370
DSN LAST 17: OT.TAPE.IN1         1ST VOLSER: 001176   VOLSQ:    1
FILESQ:    1   BLK COUNT:        711

EOF2F0300001500000T08MAK1/S010    P   B   47000
RECFM=FB    BLKSZ= 3000    LRECL= 1500

 FOR FIRST DATASET TO RECOVER: LAST 17 CHARS IN HDR1 MATCHED USER SUPPLIED LAST 17
OUTPUT FILE WRITTEN SUCCESSFULLY: OT.TAPE.OUTPUT.DSN1
FIRST FILE RECOVERED BLOCKS LOST: 0000000324


   HEADER LABELS FOLLOW

HDR1OT.TAPE.IN2      00117600010002      0072630000000000000IBM OS/VS 370
DSN LAST 17: OT.TAPE.IN2         1ST VOLSER: 001176   VOLSQ:    1
FILESQ:    2   BLK COUNT:          0

HDR2F0380001900000T08MAK2/S010    P   B   47000
RECFM=FB    BLKSZ= 3800    LRECL= 1900

OUTPUT FILE WRITTEN SUCCESSFULLY: OT.TAPE.OUTPUT.DSN2



                 RECOVERY REPORT SUMMARY

FILE OUTPUT DATASET-----------------------------INPUT LAST 17     RECFM  LRECL  BLKSIZE
00001 OT.TAPE.OUTPUT.DSN1                          OT.TAPE.IN1       FB   1500     3000
00002 OT.TAPE.OUTPUT.DSN2                          OT.TAPE.IN2       FB   1900     3800
00003 OT.TAPE.OUTPUT.DSN3                          OT.TAPE.IN3       V    2200     2204
```

Tape Browse Panel Option

The Tape Browse option is selection number LM on the Tape/Copy Primary Selection Panel. This option can be used to browse the contents of a tape datasets, as well as view the tape label information associated with the dataset.

To use this feature, the user enters the tape dataset name on the Tape Browse Panel (as well as providing any additional optional information, such as the volser and file sequence number for the dataset). In order to preserve the last used information of the tape dataset, the user can opt to have Tape/Copy open the tape outside of the control of the tape management system.

Warning Users must be authorized to mount a tape dataset under TSO/ISPF and must be authorized by their data center's security software (ACF, RACF, etc.) to open and the requested tape dataset.

Once the tape dataset name and information is provided on the Tape Browse Panel, the user presses enter, the tape is then mounted and the tape dataset opened. The dataset is displayed on the ISPF screen in logical record format, which the ability to display the data in character or hex format.

Note Up to 99,999,999 records may be displayed, though this number may be limited by internal data center restrictions or limitations).

After browsing the records of the tape dataset, users can view the tape label information by entering the SHOWTLAB command on the Tape Browse results panel.

Tape Browse Panel

An example of the Tape Browse screen is listed below, as well as descriptions of the fields on the ISPF panel.

Example

```
-------------------------- OpenTech Tape/Copy System -------------------------
TC Rx.x.x PTF x         --------  Tape Browse  --------
COMMAND ===>

 Dataset Name:
       Volser:
     File Seq:  1        1 - 65535
    Tape Unit:  3490     Tape Unit to use
   Label Type:  SL       SL, SUL or BLP
  Expdt 98000:  NO       Yes or No

 From the ISPF Browse Panel Command line displayed when the data from
 the dataset identified on this panel is shown the command SHOWTLAB may
 be entered and the Enter Key pressed to show the tape labels associated
 with dataset being displayed.

 Press enter to begin Browse operation, PF3 to return to previous panel
```

Tape Browse Fields & Defaults

The following fields appear on the Tape Browse panel and are listed in the order they appear on this panel.

Dataset Name: _____

Parameter: N/A

Default Value: N/A

Options: **This field is required** and is used to identify the tape dataset name to be browsed. Wildcards are not supported.

Volser: _____

Parameter: N/A

Default Value: N/A

Options: This field is optional, but can be used to identify the specific volser for the tape dataset to be browsed.

File Seq: _____ 1 - 65535

Parameter: N/A

Default Value: 1

Options: This field is optional, but can be used to identify the specific file sequence number on the volser for the tape dataset to be browsed. Any valid file sequence number between 1 and 65535 is supported.

Tape Unit: _____ Tape Unit to use

Parameter: N/A

Default Value: 3490

Options: **This field is required** and is used to specify the tape unit is to be used to mount the tape which is to be browsed. All valid tape unit types are supported.

Label Type: _____ SL, SUL, or BLP

Parameter: N/A

Default Value: SL

Options: This field can be used to identify the label type for the tape volser for the dataset to be browsed. Valid values are SL (Standard Label), SUL (Standard User Label), and BLP (Bypass Label Processing).

Expdt 98000: _____ YES or NO

Parameter: N/A

Default Value: NO

Options: This field is used to tell Tape/Copy whether to open the tape dataset outside of TMS control to preserve the last used information in the tape management record.

YES - Read input tape as being from outside the tape management system (EXPDT=98000).

NO - Read input tape as managed by tape management system

Tape Dataset Browse Results

After completing the Tape Browse Panel and pressing Enter, the tape dataset records are displayed in ISPF browse. Below is an example of this display for a sample tape dataset.

Note Please note that the Tape Browse results panel is a scrollable panel and PF7 (UP) and PF8 (DOWN) keys can be used to scroll up and down on the panel to display all of the fields.

Example

```
 BROWSE -- OT02.DRX.B.BKUP.B0010001.Y0723925 -------- Line 00000000 Col 001 080
 Command ===>                                                Scroll ===> PAGE
********************************* Top of Data **********************************
...........êC...OT02.OTSCLMPF.VSAM.ATLDBASE                WORK47....,...._...{
"8.........êC...OT02.OTSCLMPF.TMCDUMP.SUMMED               WORK41....,...._ ..Ø
"8.........ES....F0002.A0005.MFMV.FILE02c d0.68000068f..\...?.|.º . .3h ...f...Y
"8..........S.....ACCT1,ACCT2¸ þ..Ñ........&à.OT010003OTTC0003S010d .TAPEOUT ...
...........ãS......b........2h ª..Tj.c.h .........d.y k..........h q......^..SYS
"8.........êC...OT02.OTSCLMPF.TMCDUMP                      WORK46....,...._ ..{
"8.........bS...01× .S010d .TAPEOUT ...¬...?e .37488NNNf .1Ý .2343b .0OTTC0003OT
"8.........VS...0b .150855*OCEd .SYS1d d0.75c .50541FBe .1b .1000 32000e .126OT1
"8.........WS...03S010d .TAPEOUT 054Bd .6d .62005/047b .2005/047b .N.c..Dc .OT.Z
"8.........ZS...V.DATASETb .2005/040b .150933SYS1d .2005/040b .150934*CATd .SYS1
"8.........¶S...54FFBe .1d .80 27920g .2OT18¡ .Y2005/046b .2005/046¡ .OT18GENR×
"8.........ÒS...98b .2005/298b .IDRCYc .3f .3000c .9c .3SHELF¨ .2005/040b .2005/
"8.........0S...DRCYc .1f .1000c .2c .1SHELF¨ .2005/039b .2005/039b .2005/039b .
"8.........îS........ .|ð .2005/033b .230051SYS1d .2005/040b .104145*OCEd .SYS1þ
"8.........ØS...05/040b .151533OT11Ac .OT11Ac .OT010003z .1MASTERb dN.YNNSL NSCR
...........-S....0NNh.i .0b .0d .0d .0h.n ...b..Vc b0.1259k ........¬ð .2005/033
******************************** Bottom of Data ********************************
```

Display Tape Label Information

To view the label information from the tape dataset being displayed, the user can enter the “SHOWTLAB” command on the command line and press Enter. Up to 18 lines of label information will be displayed.

Example

```
--------------------------- OpenTech Tape/Copy System ------------------------
TC R2.6.4 PTF B2      Tape Browse - Display Tape Label Data

VOL1000031
HDR1B0010001.Y072392500003100010001     007275 993660000000IBM OS/VS 370
DSN LAST 17: B0010001.Y0723925   1ST VOLSER: 000031   VOLSQ:    1
FILESQ:    1   BLK COUNT:          0
HDR2U327600000000RFCUB144/S010    P       47000
RECFM=U     BLKSZ=32760    LRECL=    0
```

Erase Tape Utility

The Tape Security Erase job can be used to erase all data on one or more tapes. The data can be erased from either the physical load point, or from right after the VOL1 label, if there is one (preserving the VOL1 label). The data will be erased to the end of the physical tape using the Data Security Erase (DSE) command, when that command is available (3490 class and later tape drives), and by overwriting the old data with new blocks of data when DSE is not provided by the tape drives.

The erase job erases one tape at a time, using a single tape drive specified on the user's JCL, on the TAPEDD DD statement. Therefore, all tapes in a single erase job must be of the same type, i.e. 3590, 3490 etc., and mountable on that tape drive. To erase multiple tapes at the same time multiple erase jobs must be submitted.

Reasons to Erase Tapes

The following are some of the reasons to erase tapes:

- The tapes are being disposed of
- The tapes are scratched and being transferred to another company
- A site wants to erase the “residual data” (data already on the tape as it is about to be re-used as a scratch tape) so it cannot ever be read again. Residual data not erased, that is past any new data written on the tape after it is scratched, is potentially readable.

Note The data associated with a virtual tape is generally not accessible after that tape has been scratched, unlike with a real tape. Also, even if the virtual tape were to be erased there may be a copy of that data in backing storage (the physical tapes that hold virtual tape data when it is not in the VTS cache), and it may continue to exist for some period of time, until it is re-written over - though that data is also generally not accessible.

Erase Job JCL

The JCL for the job to erase datasets is located in the LMERASE member of the Tape/Copy JCL library.

TAPEDD is used for the tape device.

User Parameters Used With Erase

Note The parameters apply to each tape to be erased in the job. If tapes in a set of tapes to be erased require different parameters they must be grouped into separate erase jobs.

VOL1=KEEP/ERASE Default = KEEP
Whether the VOL1 label, if present, is to be kept or erased

VERIFYVOL1=YES/NO Default: if SL=NO, if BLP=YES
Whether to verify that a VOL1 label on the tape matches the user supplied volser

TMS=YES/NO Default = NO
Whether to verify that the volser to be erased is in fact a scratch tape according to the Tape management System. If the volume is in the TMC but has no datasets on it, use NO.

VOLSERS:
This card must come after all other parameters. It indicates that what follows on the next cards will be a list of one to 1000 six character volsers, each of which is to be erased one at a time, in the order provided.

Six Character Volsers
One or more volsers on each card. If more than one volser is on a card they are separated by exactly one blank.

CONTROL CARD FORMAT
Free form - Parms can start in any column, but must finish before col. 72

- There can be only one parm per card
- All parms must be entirely on one card (no continuation)
- Multiple volsers can be on one card separated by one blank
- An asterisk in column 1 indicates the card is a comment card

Control Card Example

```
*
    TMS=YES ..............<- Check TMS to verify volser is in scratch status
    VOL1=KEEP.............<- preserve the VOL1 label, begin erase after it
    VERIFYVOL1=YES .......<- verify VOL1 label on tape same as user volser
         VOLSERS:........<- list of volsers follows
      ETQ335 ETQ388......<- erase these 2 tapes
```

Reports

Erase Report

The *Erase* report has two sections, a detail report that gives the result of the erase operation on each tape the user supplied (successful or unsuccessful) and a summary report that gives totals for the erase job. The VOL NUM field is the relative volser number within the user's list of tapes to erase.

```
 1REL 2.7.1  PTF 0 ........... T A P E / C O P Y ........... PROGRAM OTTC0006
  DATE:  06/05/2008   TIME:  09:39:28     ERASE REPORT FOR NONE ...... PAGE 1

  VOL NUM  VOLSER   RESULT OF ERASE

        1  ETQ335   TAPE SUCCESSFULLY ERASED
        2  ETQ388   TAPE NOT SUCCESSFULLY ERASED!! SEE ERR REPORT
        3  ETQ324   TAPE SUCCESSFULLY ERASED

  THE LAST TAPE SUPPLIED BY THE USER HAS BEEN PROCESSED

*****************************************************************************

 ERASE REPORT SUMMARY

 TAPES ERASED SUCCESSFULLY:         2
 TAPES NOT ERASED:                  1
```

Erase Error Report

The *Erase Error* report is only produced when at least one erase operation failed. It gives the specific reason the erase failed on a given tape. The VOL NUM field is the relative volser number within the user's list of tapes to erase.

```
  1REL 2.7.1  PTF 0 .........  T A P E / C O P Y .........  PROGRAM OTTC0006
   DATE:  06/05/2008   TIME:  09:39:28     ERASE ERROR REPORT FOR NONE .....PAGE 1

   VOL NUM ..VOLSER.  ERROR MESSAGE

  ... ...2..  ETQ395  WAS NOT IN SCRATCH STATUS ACCORDING TO THE TMC. THIS TAPE
WILL NOT BE ERASED
  ... ...6..  ETQ347  WAS NOT IN SCRATCH STATUS ACCORDING TO THE TMC. THIS TAPE
WILL NOT BE ERASED
```

Certify and Label Tape Utility

The Certify and Label tape job can be used to certify tapes, label tapes or both certify and label a set of tapes.

The Certify/Label job processes one tape at a time, using a single tape drive specified on the user's JCL, on the TAPEDD DD statement. Therefore, all tapes in a single job must be of the same type (i.e., 3590, 3490 etc.). To process multiple tapes at the same time multiple jobs must be submitted.

Certifying a Tape

Certifying tape media involves writing data onto the tape in an attempt to determine if the tape is reliable enough to be used to hold output data. The idea is that if a certain threshold of write errors (typically data checks) is encountered during the certify process, it may be better to not use that tape, at least for critical data. The best chance to inspect the condition of the native tape media is to turn off error recovery to the degree it can be (modern tape drives do much of that automatically) so that errors during the certify process will be seen and can be counted. Tape/Copy Certify turns off the maximum amount of recovery it can. When data errors are encountered, it attempts to retry the write and continue onward. Errors other than data errors (equipment checks for example) will cause the certify process for that tape to terminate.

The capacities of the newer 3590 class of tapes are extremely large (making full certification of an entire tape lengthy in terms of time consumed - four or more hours), and at the same time the ability of the tape drive to tolerate what previously would be permanent errors is much improved, reducing the need to do certifying. For that reason, OpenTech does not recommend certifying 3590 and later tapes as a general policy before their use, although it may be worthwhile to certify one or two tapes from a new batch of received tapes. A Certify=Brief option is provided with Tape Certify that does a “quick certify”, writing only 1 GB of data and then stopping. This may or may not be of value in deciding the reliability of the tape as a whole.

When to consider a tape as too error-prone to use for output

There is no hard rule, or certain number of errors that indicates that a tape should not be used. The magnetic tape vendor may be able to provide guidelines or further information. The count of the number of write data errors is given in the Certify/Label Report detail line under the heading: “Write Errors”.

Warning Certify is a destructive operation and will overwrite all data on the tape !!

Note There is no reason to certify virtual tapes since the media the data is written to initially is not tape.

Labeling Tapes

Tape Certify/Label can be used to label a set of tapes as either NL tapes or SL tapes. The result of the labeling will be as follows:

- **NL** - When the parameter LABELTYPE=NL is used, a single tapemark will be written after the load point.
- **SL** - When the parameter LABELTYPE=SL is used, the following sequence of labels and tapemarks will be written at the front of the tape:

  VOL1, HDR1, HDR2, TM, TM, EOF1, EOF2, TM, TM

  - VOL1

    Will have the volser supplied by the user and will have the VOL1 owner field filled in using the 10-character string supplied by the OWNER= parameter.

  - HDR1 and EOF1

    EXPDT and CRDT - set to the current day's date

    Dataset Name - set to 17 character zeros

  - HDR2 and EOF2

    Recfm=U

    Blksize=32760

    Lrecl=0

Certify and Label Job JCL

The JCL for the Certify/Label job is located in the LMCERTFY member of the Tape/Copy JCL library.

TAPEDD is used for the tape device.

User Parameters Used With Certify/Label

Note The parameters apply to each tape to be processed in the job. If tapes in a set of tapes to be processed require different parameters they must be grouped into separate jobs.

VERIFYVOL1=YES/NO Default: if SL=NO, if BLP=YES
Whether to verify that a VOL1 label on the tape matches the user supplied volser

TMS=YES/NO Default = NO
Whether to verify that the volser to be processed is in fact a scratch tape according to the Tape Management System.

CERTIFY=FULL/BRIEF/NO Default = NO
Whether to certify the volsers in the list (write a pattern of data on it and see if any errors are encountered). FULL means certify the tape from the beginning to the physical end, the entire length of the tape. BRIEF means certify by writing just 1 GB of data to the tape, in a "quick certify".

LABEL=YES/NO Default = NO
Whether to label the volsers in the list

LABELTYPE=SL/NL Default = SL
The type of labels to write if labeling was chosen

OWNER=TEN CHAR STRING Default is ten blanks
User meaningful string that will go into the VOL1 label owner field

VOLSERS:
This card must come after all other parameters. It indicates that what follows on the next cards will be a list of one to 1000 six character volsers, each of which is to be processed one at a time in the order provided.

Six Character Volsers
One or more volsers on each card. If more than one volser is on a card they are separated by exactly one blank.

CONTROL CARD FORMAT:
Free form - Parms can start in any column, but must finish before col. 72

- There can be only one parm per card
- All parms must be entirely on one card (no continuation)
- Multiple volsers can be on one card separated by one blank
- An asterisk in column 1 indicates the card is a comment card

Control Card Example

```
   *
CERTIFY=BRIEF         <- DO A BRIEF (1GB) CERTIFY OF THIS TAPE
    LABEL=YES .........<- LABEL THIS TAPE
    LABELTYPE=SL ......<- WRITE SL LABELS (NOT NL)
    TMS=YES ...........<- CHECK TMS TO SEE IF THIS VOLSER IS SCRATCH
    VERIFYVOL1=YES    <- VERIFY VOL1 LABEL IF PRESENT
    OWNER=ABCD123     <- OWNER VALUE (GOES INTO VOL1 OWNER FIELD)
      VOLSERS: ........<- VOLSERS: CARD
      ETQ335 ..........<- LIST OF VOLSERS BEGINS
*
*
```

Reports

Certify and Label Report

The *Certify and Label* report has two sections, a detail report that gives the result of the certify and label operations on each tape the user supplied (successful or unsuccessful) and a summary report that gives totals for the job. The VOL NUM field is the relative volser number within the user's list of tapes to erase.

- **CERTIFY RESULT -** Tells if the certify operation completed for this tape; for FULL this means it wrote to the physical end of the tape, for BRIEF it means 1 GB of data was written in a “quick certify”. It does not indicate whether the tape encountered data errors, only whether Certify was able to complete. NA means Certify was not requested.
- **BLOCKS WRITTEN -** The number of blocks certify wrote to this tape
- **WRITE ERRORS -** The number of write errors encountered while certifying the tape
- **LABELING RESULT -** Successful, not successful, or NA if labeling was not requested

```
1REL 2.7.1  PTF 0                        T A P E / C O P Y
DATE:  07/02/2008            TIME:  08:33:44            CERTIFY AND LABEL REPORT FOR NONE

VOL NUM  VOLSER   CERTIFY RESULT           BLKS WRITTEN    WRITE ERRORS    LABELING RESULT

     1  ETQ335   CERTIFY COMPLETED              481760              0      LABELING SUCCESSFUL
     2  ETQ189   CERTIFY COMPLETED              501430              4      LABELING SUCCESSFUL

THE LAST TAPE SUPPLIED BY THE USER HAS BEEN PROCESSED
*******************************************************************************************
CERTIFY/LABEL REPORT SUMMARY

TAPES CERTIFIED TO COMPLETION:          2
TAPES CERTIFY NOT DONE/COMPLETED:       0
TAPES CERTIFY GOT WRITE ERRORS ON:      1
TAPES LABELLED SUCCESSFULLY:            2
TAPES LABEL NOT DONE/COMPLETED:         0
```

Certify and Label Error Report

The *Certify and Label Error* report is only produced when at least one operation failed. It gives the specific reason the operation failed on a given tape. The VOL NUM field is the relative volser number within the user's list of tapes to erase.

```
   1REL 2.7.1  PTF 0          T A P E / C O P Y          PROGRAM OTTC0006
   DATE: 06/05/2008   TIME: 09:39:28   CERTIFY AND LABEL ERROR REPORT FOR NONE     PAGE 1

    VOL NUM  VOLSER   ERROR MESSAGE

       2  ETQ395  WAS NOT IN SCRATCH STATUS ACCORDING TO THE TMC. THIS TAPE WILL NOT BE
  CERTIFIED
       6  ETQ347  WAS NOT IN SCRATCH STATUS ACCORDING TO THE TMC. THIS TAPE WILL NOT BE
  CERTIFIED
```

Certify and Label Status Report

The Certify and Label Status report has messages that report ongoing status of Certify operations so that you can see the progress of a long-running certify of a tape. It also prints out the VOL1, HDR1, and HDR2 labels of each tape, if labeling was requested (LABEL=YES).

```
DATE:  01/13/2012   TIME:  15:07:37     CERTIFY STATUS REPORT FOR NONE                    PAGE      1

          V00044   ABOUT TO CERTIFY TAPE     STARTING  0 BLOCKS WRITTEN DATE: 2012.013  TIME: 15:07:38
          V00044   INTERMEDIATE STATUS         1,000,000 BLOCKS WRITTEN DATE  2012.013  TIME: 15:09:23
          V00044   INTERMEDIATE STATUS         2,000,000 BLOCKS WRITTEN DATE  2012.013  TIME: 15:12:29
          V00044   END OF TAPE REACHED         2,000,484 BLOCKS WRITTEN DATE: 2012.013  TIME: 15:12:51
          V00044   ****    ABOUT TO PRINT VOL1, HDR1 AND HDR2 LABELS ***DATE: 2012.013  TIME: 15:17:43
          V00044   VOL1 VOL1V00044                              DOUG123 <-
          V00044   HDR1 HDR100000000000000000                   012013012013
          V00044   HDR2 HDR2U3276000000

          V00366   ABOUT TO CERTIFY TAPE     STARTING  0 BLOCKS WRITTEN DATE: 2012.013  TIME: 16:07:47
          V00366   END OF TAPE REACHED            1,484 BLOCKS WRITTEN DATE: 2012.013  TIME: 16:07:51
          V00366   ****    ABOUT TO PRINT VOL1, HDR1 AND HDR2 LABELS ***DATE: 2012.013  TIME: 16:07:52
          V00366   VOL1 VOL1V00366                              DOUG123 <-
          V00366   HDR1 HDR100000000000000000                   012013012013
          V00366   HDR2 HDR2U3276000000
```

Demand Erase to End of Tape Utility

The Demand Erase to End of Tape utility is used to erase a selected tape from the end of the last dataset on the last volume of a volume set.

Erase Job JCL

This job is used to execute the Tape/Copy Demand Erase to End of Tape utility.

The Demand Erase End of Tape utility takes one or more very simple control statements read from DDNAME: INFILE1 that identify one of the following:

1. The only volume of a single file/single volume volset or the dataset name of the only file for the volset.
2. A specific volume of a single file multi-volume volset or the dataset name of the only file for the volset.
3. The only volume of a multi-file single volume volset or the dataset name of one of the files for the volset.
4. A specific volume of a multi-file multi-volume volset or the dataset name of one of the files for the volset.

This function will determine the last dataset name on the last volume for the volset and request that the identified volume be mounted. It will then forward space to end of volume be mounted, then forward space to End of File on the last dataset/volume, and then skip past any labels and erase the tape up to the end of the tape indicator.

If the DDNAME: TAPEDD is allocated in the JCL, it should specify the tape unit to be used and defer. The dataset name may be specified as DSN=&&TEMP, that is:

```
//TAPEDD DD UNIT=3490,DSN=&&TEMP
```

If the DDNAME: TAPEDD is not allocated in the execution JCL, then the correct volumes will be allocated via Dynamic allocation.

The program being executed will use the volers and/or dataset names to gather required information from the OS Catalog and/or TMC to cause the proper volume to be mounted.

Control Statements

Control Statements are read from DDNAME: INFILE1 and must conform to the following:

Free form - Values can start in any column, but must finish before col. 72

- There can be only one value per card
- All values must be entirely on one card (no continuation)
- An asterisk in column 1 indicates the card is a comment card

Example

```
//INFILE1 DD *
VOL134 <specifies VOL134 as a volume of volset
OTXX.TAPE.FILE6    <identifies a volset by DSN on volset
```

A Wildcard Characters

TOPICS COVERED IN THIS APPENDIX

Wildcard Characters (page A-2)

Wildcard Characters

These rules describe the data masking that can be used for data selection by generic criteria. **Not all Tape/Copy library members and parameters will accept wildcards**. Please read the member/parameter description to see if wildcarding is permitted. In the following table, a “data string” can mean a dataset name, volser or text string.

Wildcard	Description
/	Causes the remainder of the data string to be bypassed. Ex: OTTC./ will select all dataset names that have OTTC as the first node.
*	Allows a variable number of characters to be skipped within a data string. The number of characters skipped is dependent upon when the substring following the * is matched. Ex: OTTC.*.DATA will select all dataset names that have OTTC as the first node and DATA as the last node. **NOTE:** Do not use an * in column 1 except to signify a comment.
!	Allows a single numeric character to be skipped in a data string. Ex: OTTC.DATA.G00!!V00 will select datasets of the OTTC.DATA GDG base that range from generation 00 to 99.
%	Allows a single alphabetic character to be skipped in a data string. Ex: OTTC.DATA.FILE% will select datasets that have OTTC.DATA as the first 2 nodes, then have third node that is the word FILE followed by a letter. (OTTC.DATA.FILEA, but not OTTC.DATA.FILE2).
?	Allows a single character (alphabetic or numeric) to be skipped in a data string. Ex: OTTC.DATA?.FILE will select datasets that have OTTC as the first node, a second node of DATA and a numeric or alphabetic character, then have third node of FILE. (OTTC.DATA3.FILE and OTTC.DATAX.FILE).
(xx)	Allows for dataset selection by GDG relative generation number. xx is equal to the desired relative generation number. Ex: OTTC.DATA.FILE(0) will select the most recent generation of the OTTC.DATA.FILE GDG. **NOTE:** This wildcard can only be used with inclusion and exclusion data set name lists.

B JCLLIB Library

TOPICS COVERED IN THIS APPENDIX

JCLLIB Library Member Descriptions (page B-2)

JCLLIB Library Member Descriptions

This appendix contains an explanation of each member of the Tape/Copy JCLLIB library.

AFMBUILD

This member contains JCL for a job that will build a Tape/Copy database for AFM users.

BLDBVIRD

This member contains JCL for a job used to invoke the Bulk Volume Information Retrieval (BVIR) interface for IBM virtual tape users.

Note See "Bulk Volume Information Retrieval (BVIR) Support" in Chapter 12 for more information on BVIR.

BLDCEXPF

This member contains JCL for a job that will create the calculated expiration date file (@DSPREFIX.TAPECOPY.CEXPDT).

Note See the Chapter 11 for information about Calculating Expiration Dates.

BVIRBLDS

This member contains JCL for a job used to invoke the Bulk Volume Information Retrieval (BVIR) interface for STK virtual tape users.

Note See "Bulk Volume Information Retrieval (BVIR) Support" in Chapter 12 for more information on BVIR.

CNVJBTGR

This member contains JCL for a job that will create a stand alone Conversion Job Trigger Member Status Report.

Note See the Chapter 14 for information about the Conversion Job Trigger Member Status Report.

CONFJCL

This member contains JCL for a job that will use SMF records and the tape management systems' catalog as input and create/update the Conflict Avoidance Database. The database is used to help prevent conflicts when stacking multiple datasets on a single output tape using Tape/Copy.

Note See Chapter 20 for information about this job and the Stacking Conflict Avoidance feature.

CPUID

This member contains JCL for a job that will report the serial number of the CPU on which the job is run, in case you do not already have this information available. The job card must be modified to meet your system's requirements and the dataset name of the Tape/Copy LOADLIB library must be placed in the STEPLIB DD before the job is submitted. After the job completes successfully, the last three lines of the job output should look similar to this:

```
CVT   CPUID=FF01ADFE20940000 2094-UNK

STIDP CPUID=FF01ADFE20948000 2094-UNK

STSI  CPUID=  04ADFE         2094-720
```

The third through eighth characters after CPUID= (in this example - 01ADFE or 04ACFE) will be the 6-digit CPU serial number needed for Technical Support to generate an authorization code that allows Tape/Copy to run on that system. The authorization code is then placed in the AUTHCODE member of the Tape/Copy PARMLIB library (normally during installation).

Warning The Tape/Copy LOADLIB library must be APF authorized for this job to run successfully.

DCCINVRP

This member contains the JCL to run the Dual Copy Inventory Report utility. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCCLNUP

This member contains the JCL to run a Dual Copy Clean-up job. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCCRENNN

This member contains the JCL to run the Dual Copy Auto Newname Converter Utility. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCFLRCVY

This member contains the JCL to run a Dual Copy Mass Recovery batch job. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCFLRSTR

This member contains the JCL to run a Dual Copy Mass Restore batch job. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCVPCCA1

This member contains the JCL to run the CA-1 Vault Pattern Converter. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCVPCRMM

This member contains the JCL to run the RMM Vault Pattern Converter. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCVPCTLM

This member contains the JCL to run the TLMS Vault Pattern Converter. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

DCVPCZAR

This member contains the JCL to run the ZARA Vault Pattern Rules Converter. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

IEBDG

This member contains JCL for a job that may be used to create tape data that can be used for testing Tape/Copy's features.

KEYDBBK

This member contains the JCL used to backup the CopyCrypt key Database. The job will backup the VSAM key database to a flat file and consolidate all generation of the active key database log to the backup key database log.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBCMP

This member contains JCL that can be used to compare two CopyCrypt Key Databases to verify that they are "identical" (in that all user keys, master key data, and effective control information is the same). This job is usual for verifying that the home site and DR site copies of the key database are the same to avoid potential errors during recovery.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBINI

This member contains the JCL used to create and initialize the CopyCrypt encryption key database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBMAS

This member contains JCL used to create and/or change the master key for the CopyCrypt key database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBMS1

This member contains JCL used to pass random numbers to the key database, as required for creating a master key for the CopyCrypt Key Database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBRAN

This member contains JCL that will generate three random numbers, as required for creating a master key for the CopyCrypt Key Database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBRST

This member contains JCL that is used to restore the CopyCrypt Key Database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBUPD

This member contains JCL that is used to add, expire, rename and delete keys in the CopyCrypt Key Database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

KEYDBVAL

This member contains JCL that can be used to validate the CopyCrypt Key Database and print a list of the keys in the database.

Note See the CopyCrypt User Guide for more information about CopyCrypt and the CopyCrypt Key Database.

LISTBIND

This member contains JCL that can be used to create a Binding Date and Time Report. This report lists all of the modules in the Tape/Copy LOADLIB and the binding date and time of each module. This information is sometimes requested by Technical Support when a problem is reported.

Example

```
BINDING DATE AND TIME REPORT

 INPUT DSNAME                                    VOLSER     MODULE NAME     SECTION NAME     BINDING DATE       TIME
 ---------------------------------------------   ------     -----------     ------------     ------------     --------
 OT.TAPECOPY.LOADLIB                             SFTWR2       CATTAPES        CATTAPES         2000/027       00:06:44
                                                              CHECKCAT        CHECKCAT         2000/055       16:11:46
                                                              CHNGBINQ        CHNGBINQ         2000/027       00:07:12
                                                              CTLGDSNS        CTLGDSNS         2000/354       09:49:38
                                                              DELRDS          DELRDS           1998/076       00:00:00
                                                              DUMPEXTR        DUMPEXTR         2000/033       08:33:14
                                                              DUMPMOD         DUMPMOD          1996/319       00:00:00
                                                              FIXMDB          FIXMDB           2000/167       12:40:57
                                                              LISTASMD        LISTASMD         2001/037       09:34:49
                                                              LISTBIND        LISTBIND         2001/037       15:37:05
                                                              LISTIDR         LISTIDR          2000/334       15:30:54
                                                              MAKEJCL         MAKEJCL          2000/027       00:08:45
                                                              MAKETAPE        MAKETAPE         2000/027       00:09:18
                                                              MTAPEUND        MTAPEUND         1997/160       00:00:00
                                                              MTAPEVB         MTAPEVB          1997/162       00:00:00
                                                              OTEX0001        OTEX0001         2001/029       08:56:19
                                                              OTEX0002        OTEX0002         2001/029       08:55:53
                                                              OTEX0003        OTEX0003         2001/030       15:35:17
                                                              OTEX0004        OTEX0004         2001/029       08:55:45
                                                                   .  .            .                .
                                                                 .               .                .              .
                                                              TESTC           TESTC            2000/327       07:40:59
                                                              TESTDATE        TESTDATE         1998/248       00:00:00
                                                              TESTDCB         TESTDCB          1997/225       00:00:00
                                                              TESTDCB1        TESTDCB1         1998/296       00:00:00
                                                              TESTDCB2        TESTDCB2         1998/296       00:00:00
                                                              TESTEXCP        TESTEXCP         1999/296       07:37:29
                                                              TESTSTAE        TESTSTAE         1998/054       00:00:00
                                                              TESTVSAM        TESTVSAM         1999/068       00:00:00
                                                              TEST0003        TEST0003         1997/157       00:00:00
                                                              TEST0354        TEST0354         1998/289       00:00:00
                                                              TEST1           TEST1            2000/335       17:09:25
                                                              VMFEXTR2        VMFEXTR2         1999/097       13:59:07
```

LISTIDR

This member contains the JCL used to create a Maintenance Level Report which shows which zaps have been applied to the specified Tape/Copy LOADLIB. The Maintenance Level Report is also created whenever Tape/Copy abends. This report lists all of the “zap” maintenance that has been applied to the specified LOADLIB library, the date the maintenance was applied, as well as the module that was affected.

Example

```
MAINTENANCE LEVEL REPORT

 INPUT DSNAME                                    VOLSER     MODULE NAME     SECTION NAME     DATE APPLIED     MAINT ID
 ---------------------------------------------   ------     -----------     ------------     ------------     --------
 OT.TAPECOPY.LOADLIB                             SFTWR1       OTTC0002        OTTC0002         2000/203       PTF02Z15
                                                              OTTC0003        OTTC0003         2000/173       PTF02Z13
                                                              OTTC0004        OTTC0004         2000/123       PTF02Z01
                                                              OTTC0004        OTTC0004         2000/147       PTF02Z09
                                                              OTTC0008        OTTC0008         2000/146       PTF02Z06
                                                              OTTC0008        OTTC0008         2000/146       PTF02Z06
                                                              OTTC0009        OTTC0009         2000/173       PTF02Z13
                                                              OTTC0009        OTTC0009         2000/203       PTF02Z20
                                                              OTTC0011        OTTC0011         2000/173       PTF02Z13
                                                              OTTC0012        OTTC0012         2000/173       PTF02Z13
                                                              OTTC0013        OTTC0013         2000/173       PTF02Z13
                                                              OTTC0014        OTTC0014         2000/173       PTF02Z13
                                                              OTTC0015        OTTC0015         2000/173       PTF02Z13
                                                              OTTC0016        OTTC0016         2000/173       PTF02Z13
                                                              OTTC0022        OTTC0022         2000/173       PTF02Z13
                                                              OTUT0073        OTUT0073         2000/173       PTF02Z13
                                                              OTUT0086        OTUT0086         2000/137       PTF02Z04
                                                              OTUT0161        OTUT0161         2000/143       PTF02Z05
                                                              OTUT0200        OTUT0200         2000/139       PTF02Z02
                                                              OTUT0203        OTUT0203         2000/173       PTF02Z12
                                                              OTUT0203        OTUT0203         2000/180       PTF02Z14
                                                              OTUT0203        OTUT0203         2000/203       PTF02Z19
                                                              OTUT0205        OTUT0205         2000/139       PTF02Z02
                                                              OTUT0207        OTUT0207         2000/139       PTF02Z02
                                                              OTUT0208        OTUT0208         2000/139       PTF02Z02
                                                              OTUT0311        OTUT0311         2000/173       PTF02Z11
                                                              OTUT0311        OTUT0311         2000/173       PTF02Z12
                                                              OTUT0311        OTUT0311         2000/203       PTF02Z19
                                                              OTUT0312        OTUT0312         2000/173       PTF02Z12
                                                              OTUT0312        OTUT0312         2000/203       PTF02Z19
                                                              OTUT0358        OTUT0358         2000/147       PTF02Z08
                                                              OTUT0384        OTUT0384         2000/146       PTF02Z07
                                                              OTUT0384        OTUT0384         2000/195       PTF02Z17
                                                              OTUT0398        OTUT0398         2000/125       PTF02Z03
                                                              OTUT0404        OTUT0404         2000/152       PTF02Z10
                                                              OTUT0412        OTUT0412         2000/152       PTF02Z10
```

LMCERTFY

This member contains sample JCL for the Library Management Tape Certify and Label function.

LMERASE

This member contains sample JCL for the Library Management Tape Security Erase function.

LMRECOVR

This member contains the JCL for attempting to recover overwritten tape datasets.

Note See "Recovering Overwritten Datasets" for more information on the Tape/Copy's Recover Overwritten Tape Datasets feature.

OAMUPDAT

This member contains the JCL for a job that will execute the OAM Tape Vol Update utility. This job updates the OAM DB2 tables from control statements generated by Tape/Copy and VDR recovery of object storage and backup tape volumes.

OTTCPROF

This member contains the Tape/Copy ISPF profile. The contents of this member should not be modified, but it can be copied over the default ISPF profile should you encounter problems.

PRESTKCF

This member contains JCL for a job that is used to maintain the stack to preexisting volume control file. It supports the deletion of all records or selected records through the uses of control cards.

RENAME

This member contains JCL for a job that will execute the Tape/Copy Rename utility. This member applies to VDR authorized users only. See "Virtual Data Recovery (VDR) Guide" for more information.

RESTARTU

This member contains JCL for a job that will execute the Restart Dataset Maintenance utility to report or remove entries from the Restart Dataset.

RMMPENDI

This member contains JCL for a job that will automate the process of running logical INIT's for RMM tapes in Pending INIT status.

SAMPACS

This member contains a sample of the JCL that gets created by the ACS Copy feature of Tape/Copy.

SAMPCAND

This member contains a sample of the JCL that gets created by the Mass Copy feature of Tape/Copy.

SAMPCOD

This member contains a sample of the JCL that gets created by the Copy on Demand feature of Tape/Copy.

SETUP

This member contains JCL for Tape/Copy's Automated Setup program. This JCL is typically used during installation, but may need to be used if new hardware is added or if esoteric names have changed.

Note See the Tape/Copy Installation Guide or Chapter 6, "Tape/Copy Housekeeping"for more information on the SETUP JCL.

STATSRPT

This member contains JCL for a job that will produce a Conversion Statistics Report. This report is always generated when a Candidate Selection job is run, but this job will allow you to run the report "stand alone". This report shows a daily summary of all of the Tape/Copy activity recorded in the Tape/Copy Statistics file. See Chapter 7 for more information regarding Tape/Copy's Statistics file.

```
RELEASE x.x.x  PTF LEVEL x                                    T A P E / C O P Y                    PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CONVERSION STATISTICS REPORT FOR OPENTECH_SYSTEMS,_INC.                       PAGE      1

             9 TRACK+  +------------18 TRACK-------------+  +------------36 TRACK-------------+  +------------128
TRACK------------+
             NON-ATL+  +-----INPUT-----+ +-----OUTPUT----+  +-----INPUT-----+ +-----OUTPUT----+  +-----INPUT-----+
+-----OUTPUT----+
            NOCOMP-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+  NON-ATL+ +--ATL-+ NON-ATL+ +--ATL-+
CONVERSION   INPUT/    NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/   NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/   NOCOMP/  NOCOMP/  NOCOMP/  NOCOMP/
   DATE       OUTPUT      COMP     COMP     COMP     COMP      COMP     COMP     COMP     COMP      COMP     COMP     COMP     COMP

1997.148         2         0        0        2        0         0        0        0        0         0        0        0        0
  5/28/1997        0         0        0        0        0         0        0        0        0         0        0        0        0
1997.161         0         7        0        0        0         0        0        0        0         0        0        0        0
  6/10/1997        1         0        0        0        0         0        0        0        0         0        0        0        0
1997.162         1         8        0        7        0         0        0        0        0         0        0        0        0
  6/11/1997        2         0        0        0        0         0        0        0        0         0        0        0        0
      .
      .
      .
1998.156         0         3        0        0        0         0        0        0        0         0        0        0        0
  6/ 5/1998        1         0        0        0        0         0        0        0        0         0        0        0        0
1998.157         0        15        0        0        0         0        0        0        0         0        0        0        0
  6/ 6/1998        5         0        0        0        0         0        0        0        0         0        0        0        0
1998.158         0         8        0        0        0         0        0        0        0         0        0        0        0
  6/ 7/1998       10         0        0        0        0         0        0        0        0         0        0        0        0

GRAND TOTAL     12       221        0       30        0         0        0        0        0         0        0        0        0
                177       135        0        0        0         0        0        0        0         0        0        0        0
```

STKCLEAN

This member contains JCL for a job that will perform a clean-up of the Stack Management Controlled volume sets.

Note See the Chapter 19 for information about this job and the Stack Management Control feature.

TAPANLYZ

This member contains the JCL to run the Tape Analysis Utility.

Note See Chapter 24 for more information on this utility.

TAPCOMPR

This member contains the JCL to run the Tape Compare Utility.

Note See Chapter 24 for more information on this utility.

TCAUDIT

This member contains an Assembler macro record layout for Audit Log records.

Note See Chapter 7 for more information on the Tape/Copy's Audit features.

TCERASET

This member contains the JCL to execute the Demand Erase To End of Tape function.

Note See Chapter 34 for more information on the Demand Erase To End of Tape function.

TCSTATS

This member contains an Assembler macro record layout for statistics records.

Note See Chapter 7 for more information on the Tape/Copy's Statistics file.

TLMSSTEP

This member contains the JCL for a job step that TLMS users will need to run prior to their TLMS daily maintenance job. This JCL can be scheduled to run "stand alone" (a valid job card will need to be added to the JCL to run as a stand alone job) or the step can be added to the TLMS daily maintenance job.

Warning This JCL step must run prior to the CATTRS step on a daily basis to ensure proper tape expiration is set on tapes processed by Tape/Copy. See Chapter 3 in the Tape/Copy Installation Guide for complete information.

VDRA110

This member contains the JCL for a job that pre-allocate an SMF extract dataset into which the SMF extract data will be written by the VDR Implementation Analysis SMF Extract Program.

Note See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

VDRA120

This member contains the JCL for a job that reads SMF data and extracts the fields of all tape records that are used by the VDR Implementation Analysis utility.

Note See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

VDRA121

This member contains the JCL for a job that reads SMF data and CA-1 vault patterns and extracts the SMF data fields of all tape records that match the CA-1 vault patterns. The extracted SMF data is used by the VDR Implementation Analysis utility.

Note See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

VDRA122

This member contains the JCL for a job that reads SMF data and RMM vault patterns and extracts the SMF data fields of all tape records that match the RMM vault patterns. The extracted SMF data is used by the VDR Implementation Analysis utility.

Note See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

VDRA123

This member contains the JCL for a job that reads SMF data and TLMS vault patterns and extracts the SMF data fields of all tape records that match the TLMS vault patterns. The extracted SMF data is used by the VDR Implementation Analysis utility.

Note See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

VDRA124

This member contains the JCL for a job that reads SMF data and ZARA vault patterns and extracts the SMF data fields of all tape records that match the ZARA vault patterns. The extracted SMF data is used by the VDR Implementation Analysis utility.

Note See Chapter 4 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Implementation Analysis utility.

VDRBCUUP

This member is used to execute the VDR Business Continuance Utility program.

Note See Chapter 12 of the "Virtual Data Recovery (VDR) Guide" for more information on the VDR Business Continuance Utility.

ZAP

This member contains the JCL that can used for applying maintenance zaps to the Tape/Copy LOADLIB. Maintenance zaps will either be sent directly by Technical Support if you report a problem, or the currently published zaps can be found on OpenTech Systems' Support website at:

http://www.opentechsystems.com/support.php

C PARMLIB Library

TOPICS COVERED IN THIS APPENDIX

PARMLIB Member Descriptions (page C-2)

PARMLIB Member Descriptions

This appendix contains an explanation of each member of the Tape/Copy PARMLIB library.

In addition to the information listed here, the comment section of each PARMLIB library member contains a list of the applicable PARMLIB statement coding rules for that member. Also, the functions of the DEFAULTS load module and USERSETS PARMLIB members and the hierarchy of the Tape/Copy parameters are described in more detail in Chapter 8.

While these members can all be accessed by using ISPF browse or ISPF edit, many of the more frequently updated members are accessible through the Tape/Copy ISPF panels. See Chapter 26 for more information on the PARMLIB Panel Option.

ACSTABLE

This member is used to identify ACS selection criteria for users of the ACS Copy option.

Format record layout:

1st field	ACS class type (DATACLAS, MGMTCLAS, STORCLAS)
2nd field	ACS class name
3rd field	Input/Output allocation control table (IOCNTLTB) output media type targeting the desired virtual tape library.

Statement coding rules:

- Only one set of ACS criteria per statement
- Table processing is in order from the top of the list to the bottom.
- The fields may start in any statement column of the record.
- Each field is no longer than eight characters.
- Anything beyond the third field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.
- Wildcards are not allowed.

Note See Chapter 29 for more information on using ACS Copy selection criteria.

ARCHNAME

This member is used to identify the pseudo volser names used by DASD archival products.

Warning This member should never be modified by the user.

ATLDRVRS

This member is currently not in use.

AUTHCODE

An authorization code is required for each CPU on which Tape/Copy will execute. This member is where the authorization code(s) should be placed.

Statement coding rules:

- Only one authorization code record per statement
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.

To acquire your authorization code please contact your Tape/Copy representative, call the OpenTech Technical Support number at 469-635-1500 or send an e-mail to productkey@opentechsystems.com. Please have the 6 digit CPU serial number and the CPU model (for example: 9672-R75) available.

If you are not sure of the CPU serial number you can issue the MVS command D M=CPU to obtain the information, or you can use the job that has been provided to identify it for you. The JCL for that job is located in the Tape/Copy JCLLIB library in the CPUID member and will require job card modification.

BADMEDIA

This table is used for tracking bad media. The entries in this table are added by the Tape/Copy conversion jobs when a media error is detected during the data transfer process, or when a bad condition code is returned from the copy engine. The EXCLUDE-ABENDING-TAPE-VOLSERS parameter must be set to YES (it is set to YES by default) for this information to be recorded. These volsers will be excluded from further Tape/Copy processing.

Format record layout:

1st field	Volser
2nd field	Abend Code
3rd field	Reason Code
4th field	Date of the media error
5th field	Time of the media error

A Bad Media Report will be generated by each Candidate Selection job (unless the BAD-MEDIA-REPORT parameter is set to NO) to indicate the contents of this member. If a tape volume that has been added by a Tape/Copy conversion job to this member is no longer considered bad media, the table entry for that volser may be deleted from this member so that it is no longer excluded from processing. When the BADMEDIA report is being produced, each volume contained within the BADMEDIA parmlib member will be checked against the TMC, volumes with datasets created after the date listed in the BADMEDIA entries will be declared obsolete and will be removed from the BADMEDIA parmlib member.

BVIRBASE

This member is populated by the automated setup program and contains the names of the primary and secondary (if available) peer-to-peer devices for use with Tape/Copy's processing of the IBM or STK Bulk Volume Information Retrieval features.

Note See Chapter 12 for more information on the BVIR interface.

CNVABEND

This member provides a means for the user to selectively control the actions that Tape/Copy conversion jobs perform during most abend recovery processing. Entries in this table will determine if volume serial numbers are to be recorded in the BADMEDIA member for specified abend codes. Entries will also control the conversion termination processing for most abends. Certain termination conditions can not be over-ridden by entries in this table. Default termination and BADMEDIA recording is described in the table processing paragraphs below.

Format record layout:

1st field	ABEND CODE IN THE IEC MESSAGE FORMAT Sxxx-rr or Uxxxx.
2nd field	RECORD INPUT VOLSER IN BAD MEDIA MEMBER, Y OR N
3rd field	STOP CONVERSION IF MOVE PROCESS, Y OR N
4th field	STOP CONVERSION IF MOVE/STACK PROCESS, Y OR N
5th field	STOP CONVERSION IF COPY PROCESS, Y OR N
6th field	STOP CONVERSION IF COPY/STACK PROCESS, Y OR N

Statement coding rules:

- Fields may begin in any position. They must be separated by at least one blank.
- Anything beyond the sixth field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.
- A question mark may be used as the first character of an abend code or as both characters of the reason code. Other wildcards are not allowed.

This table is processed in the order that the entries appear in the member. The first matching entry determines the actions taken.

BADMEDIA entries are controlled by the 2nd field value, Y or N. When the Abend Code-reason code does not match a table entry the VOLSER or the first VOLSER will be recorded if the DCB Abend Exit was invoked and the abend was not ignored.

Termination actions are controlled by the 3rd through 6th fields, Y or N, for the different types of conversion processes. They are honored for any abend codes other than the following:

- **Sx22** - MVS or operator cancellation codes.
- **S213** - DASD dataset abend codes.
- **S0Cx** - Execution exception abend codes. Continuation is supported for abend code S0C7 only.
- **Sx13** - Dataset open close abend codes. Termination will occur when two consecutive Sx13 abends are detected

Continuation of the conversion process will be attempted for the next volset following the one causing the failure when an action is not specified by a table entry or the exceptions listed above.

Warning This table should be modified only when recommended by Tape/Copy support. This member must not be deleted or be empty, it must contain at least one valid entry.

CNVDRVRS

This member is currently not in use.

CNVS2JCL

This member provides a means to the user to add a job step to the JCL after the Tape/Copy conversion JCL. The contents of this member will immediately follow the conversion job JCL. The contents must be a valid job step according to JCL standards.

COLOCTBL

This member contains the rules for creating a Co-Location Table.

Format record layout:

1st field	RULE - This is the rule logic modifier column.
2nd field	COMPARE FIELD - This is the name of the tape management database field that will be tested against the specified criteria.
3rd field	OP - This is the comparison operand.
4th field	COMPARE DATA - This is the data that will be tested against the tape management database records.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note See Chapter 21 for complete information on the Co-Location facility and building a Co-Location table.

COPYRULE

This member contains the rules for creating a VDR Copy Rules Table (used in Recovery to Disk).

Format record layout:

1st field	RULE or VERB- This is the rule logic modifier or verb column.
2nd field	COMPARE FIELD - This is the name of the tape management database field that will be tested against the specified criteria.
3rd field	OP - This is the comparison operand.
4th field	COMPARE DATA - This is the data that will be tested against the tape management database records.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note See Chapter 11 of the VDR Guide for complete information on VDR Copy Recovery-to-Disk and building a Copy Recovery Rules Table.

CRYPTRUL

This member contains rules for encrypting and/or decrypting data with CopyCrypt.

Format record layout:

1st field	RULE or VERB- This is the rule logic modifier column.
2nd field	COMPARE FIELD - This is the name of the tape management database field that will be tested against the specified criteria.
3rd field	OP - This is the comparison operand.
4th field	COMPARE DATA - This is the data that will be tested against the tape management database records.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note See the "User Guide" for more information about defining encryption and/or decryption rules for CopyCrypt.

DCPCTCTL

This member is used to define control statements that specify the report criteria for the Dual Copy Utilization % Report.

Note VDR users only. See Chapter 14 of the "Virtual Data Recovery (VDR) Guide" for more information on the Dual Copy Utilization % Report.

DFDSSJCL

This member is currently not in use.

DISKALOC

This member contains the rules for creating a Disk Control Table for use with VDR's Tape-to-Disk Recovery.

Format record layout:

1st field DISKNAME - A 1-8 character value that is referenced by entries in the DISKRULE member of the Tape/Copy PARMLIB. The DISK RULE processing uses the DISK NAME value to find the required entry in this member.

2nd field VOLSER - UNIT NAME

Options

- *xxxxxx* - Volume serial number of the output device to be used. Allocation will be made by referencing the value in the UNIT TYPE column.
- =*unitname* - Specifies a generic/esoteric unit name from the EDT (eligible device table)
- @*unitname* - Specifies a generic/esoteric unit name not genned into the EDT (eligible device table)
- /nnnn - Specifies a UCB address as a 4-character value (leading zeros should be added for UCBs that are less than 4-characters).

3rd field UNIT TYPE - Identifies the physical DASD unit type. This value is used to calculate primary and secondary space allocations.

4th field SMS DATACLAS - This defines the value to use in the DATACLAS= JCL parameter when building the DD statements for the recovery process.

Options

- N/A - Not applicable
- dataclas - SMS data class name

5th field SMS STORCLAS - This defines the value to use in the STORCLAS= JCL parameter when building the DD statements for the recovery process.

Options

- N/A - Not applicable
- storclas - SMS storage class name

6th field SMS MGMTCLAS - This defines the value to use in the MGMTCLAS= JCL parameter when building the DD statements for the recovery process.

Options

- N/A - Not applicable
- storclas - SMS storage class name

7th field VOL CNT - Specify the number of volumes requested (1-59).

NOTE - If the VOLSER - UNIT NAME field contains a volser or a UCB address, the value of this field will be forced to "1".

8th field MAX PRI TRACKS - Allows the user to limit the maximum primary track allocation.

Options

- NONE - No attempt will be made to limit the primary tracks to be allocated.
- *nnnnnnn* - A number from 1-9999999 to serve as the maximum tracks to use in primary allocation for this DISK.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note See Chapter 11 of the "Virtual Data Recovery (VDR) Guide" for more information VDR Recovery-to-Disk.

DISKRULE

This member is used to define the Tape-to-Disk Rules Table for use with VDR's Tape-to-Disk Recovery.

Format record layout:

1st field RULE - This is the rule logic modifier column.

2nd field COMPARE FIELD - This is the name of the tape management database field that will be tested against the specified criteria.

3rd field OP - This is the comparison operand.

4th field COMPARE DATA - This is the data that will be tested against the tape management database records.

5th field DISK NAME - This is the name of the corresponding entry in the DISKALOC PARMLIB member that will be used as the result of the "THEN" condition occurring.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note For more information VDR Recovery-to-Disk, see Chapter 11 of the "Virtual Data Recovery (VDR) Guide".

DSNALLOC

This member is used to override new file allocations for Tape/Copy. Its purpose is to give you limited allocation control over datasets dynamically allocated by OpenTech software. This member was originally developed to give you control over Tape/Copy's AUDITLOG and TMCDUMP file sizes; however, most OpenTech disk datasets can be changed through this member.

Overall Logical Statement Layout

- A dataset name or a dataset name pattern (dataset name with wildcard characters)
- One or more keyword and value pairs

Logical Transaction Format Details

- Each statement within DSNALLOC's data is a dataset name or dataset pattern followed by subordinate keyword and value clauses.
- The dataset name pattern can be a specific dataset name or a dataset name with OpenTech wildcard characters.
- Statements are free form in the sense that keyword position and order do not matter.
- Statements can be continued from one row to the next using a dash (-). A statement ends when a given row is not continued.
- The overrides are limited to NEW datasets; you cannot override a preexisting dataset.

Statement Coding Rules

- Every statement begins with a dataset name. The dataset name must match a dataset belonging Tape/Copy. A mistyped dataset name renders the statement useless.
- The dataset name may begin in any column.
- The dataset name may contain wildcard characters.
- The first entry in DSNALLOC that matches a given Tape/Copy dataset name is used for overriding the allocation. Therefore, when duplicate entries exist, the first occurrence in DSNALLOC is used.
- An entry with wildcards should not be too generic; otherwise, it could unintentionally match an allocation request other than for what the wildcard pattern was intended.
- If the file being overridden is a generation dataset, specify the generation dataset base name (that is, do not wildcard the G0000V00).
- Keyword and value pairs are separated by one or more blanks. The keyword, equal sign, and keyword value do not contain blanks between them; e.g., KEYWORD=VALUE. A given keyword and its value must begin and end on one statement.
- An asterisk (*) in column 1 is a comment.
- Errors are reported in a report DD //ALLOCDSN.

Useful Applications

- OpenTech hard codes AUDITLOG allocations to 95 tracks with 95 track secondaries. Using this facility, you can increase AUDITLOG space allocations beyond 95 tracks.
- OpenTech hard codes TMCDUMP allocation for RMM users to 600 Cylinders. Using this facility, you can reduce the TMCDUMP space allocation.

Examples:

- Override TMCDUMP space allocation

  OT.TAPCOPY.TMCDUMP ALLOC=CYL PRIMARY=100 SECONDARY=50
- Override AUDITLOG space allocation

  OT.TAPCOPY.AUDITLOG ALLOC=CYL PRIMARY=100 SECONDARY=50

Note Never specify RLSE=YES for AUDITLOG. This may under-allocate AUDITLOG files and make them more prone to Sx37-type abends.

Supported Keywords

ALLOC=	Change the default allocation type to TRK or CYL
PRIMARY=	Specify a different primary allocation
SECONDARY=	Specify a different, or nullify a secondary space allocation.
DIRBLKS=	Specify a different quantity for PDS directory blocks.
RLSE=	Release the space when the dataset is closed; or stop releasing space when a dataset is closed.
VOLCOUNT=	Specify the maximum number of volumes to which a dataset can extend.
FREE=CLOSE	De-allocate the dataset when the file is closed; or cease freeing the dataset at close time.
PREEXIST=	Scratch a preexisting dataset; or stop scratching a preexisting dataset.
DATACLAS=	Specify SMS Data Class. OpenTech allocates data class using DYNAMIC ALLOCATION DATA CLASS; this parameter granularly specifies a different data class. DATACLAS=NONE causes the parameter to be ignored.
STORCLAS=	Specify SMS Storage Class. OpenTech allocates data class using DYNAMIC ALLOCATION STORAGE CLASS; this parameter granularly specifies a different storage class. STORCLAS=NONE causes the parameter to be ignored.
MGMTCLAS=	Specify SMS Data Class. OpenTech allocates data class using DYNAMIC ALLOCATION MANAGEMENT CLASS; thus this parameter granularly specifies a different data class. MGMTCLAS=NONE causes the parameter to be ignored.

VOLSER=	Specify one target volume serial number. OpenTech specifies volume serial based on DYNAMIC ALLOCATION VOLSER; thus, this parameter can granularly specify a different volume serial number. VOLSER=NONE causes the parameter to be ignored.
UNIT=	Specify values like UNIT=3390 or UNIT=SYSDA. OpenTech allocates UNIT using DYNAMIC ALLOCATION UNIT; thus this parameter can granularly specify a different UNIT.
LRECL=	Specify a different record length than the one specified by Tape/Copy.
BLKSIZE=	Specify a different block size than the one specified by Tape/Copy.
DSORG=	Specify DSORG value different from those used by OpenTech.
RECFM=	Specify RECFM values different from those used.

Examples and Limitations

Keyword and Example	JCL Equivalent	Limitations
ALLOC=CYL or ALLOC=TRK	SPACE=(CYL,…)	If specified, must be CYL or TRK
PRIMARY=10	SPACE=(CYL,(10))	Can be a number up to 16,777,215. Space must be available
SECONDARY=5	SPACE=(CYL,(10,5))	Same limitations as PRIMARY; in some circumstances it may be useful to specify 0
DIRBLKS=50	SPACE=(CYL,(10,5,50))	
RLSE=YES or RLSE=NO	SPACE=(CYL,(10,5,50),RLSE)	If OpenTech allocation contains RLSE, using RLSE=NO can nullify that.
VOLCOUNT=3	VOLUME=(,,,3)	UNIT=(SYSDA,3) and VOLUME=(,,,3) are functionally equivalent.
FREE=CLOSE or FREE=NONE	FREE=CLOSE	FREE=NONE can be used to nullify OpenTech specification of FREE=CLOSE.
PREEXIST=SCRATCH PREEXIST=NOSCRATCH	DISP=(MOD,DELETE,DELETE) preceding NEW allocation	
DATACLAS=DATACLAS	DATACLAS=DATACLAS	Object should be a valid SMS data class
STORCLAS=STORCLAS	STORCLAS=STORCLAS	Object should be a valid SMS storage class
MGMTCLAS=MGMTCLAS	MGMTCLAS=MGMTCLAS	Object should be a valid SMS management class
VOLSER=V00001	VOL=SER=V00001	Limited to one volume

Keyword and Example	JCL Equivalent	Limitations
UNIT=3390	UNIT=3390	
LRECL=999	Same	Limit is 32760
BLKSIZE=999	Same	Limit is 32760; can be 0, in which case block size is determined when the dataset is opened and closed
DSORG=PS or DSORG=PO	Same	
RECFM=FB	Same	F,V,U,B,A,M are supported

EXCLACT#

This member is used to exclude datasets from processing by identifying the account numbers of datasets you do not want Tape/Copy to process during candidate selection.

Format record layout:

1st field Account number

Statement coding rules:

- The account number must look exactly the same way it does in the tape management system database.
- Only one account number may be listed per line.
- The entry may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLCRJB

This member is used to exclude datasets from processing by identifying the creating job name of datasets you do not want Tape/Copy to process during candidate selection.

Format record layout:

1st field Creating job name

Statement coding rules:

- The creating job name must look exactly the same way it does in the tape management system database.
- Only one creating job name may be listed per line.

- The creating job name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLCRPG

This member is used to exclude datasets from processing by identifying the creating program name of datasets you do not want Tape/Copy to process during candidate selection.

Format record layout:

1st field Creating program name

Statement coding rules:

- The creating program name must look exactly the same way it does in the tape management system database.
- Only one creating program name may be listed per line.
- The creating program name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLCRSN

This member is used to exclude datasets from processing by identifying the creating system name of datasets you do not want Tape/Copy to process during candidate selection.

Format record layout:

1st field Creating system name

Statement coding rules:

- The creating system name must look exactly the same way it does in the tape management system database.
- Only one creating system name may be listed per line.
- The creating system name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.

- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLDSCJ

This member is used to exclude datasets from processing by identifying the dataset name/creation job name combination you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Dataset name

2nd field Creating job name

Statement coding rules:

- Only one dataset name/creation job name combination may be listed per line.
- The dataset name may begin in any column.
- The creation job name must follow the dataset name and be separated by at least one blank.
- The dataset name and creation job name must be in the same statement. Statement continuation is not supported.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLDSNS

This member is used to exclude datasets from processing by identifying the dataset name you do not want Tape/Copy to process during candidate selection.

Format record layout:

1st field Dataset name

Statement coding rules:

- Only one dataset name may be listed per line.
- The dataset name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLDTYP

This member is used to exclude datasets from candidate selection processing by identifying the catalog device type on which the dataset is located. This member is used in conjunction with the PROCESS-CATALOG-DEVTYPE-INCLUDE/EXCLUDE-LISTS parameter.

Format record layout:

1st field Device type (8 hexadecimal characters)

Statement coding rules:

- Only one device type may be listed per line.
- The device type may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

EXCLJOBS

This member is used to identify the Audit Log file records with conversion job names that you do not want Tape/Copy to list when generating an Audit Log Report.

Format record layout:

1st field Any valid Tape/Copy conversion job name

Statement coding rules:

- Only one conversion job name may be listed per line.
- The conversion job name may begin in any column.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

EXCLMSGS

This member is used to identify the messages that you do not want Tape/Copy to list on the Dataset Rejection Report. (These messages will still be included in the totals on the Dataset Rejection Summary Report.) This member is used in conjunction with the BYPASS-REJECTION-MESSAGE-PROCESSING parameter.

Format record layout:

1st field Any 5 character rejection message code (example: M0097)

Statement coding rules:

- Only one message code may be listed per line.
- The message code may begin in any column.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

EXCLOUTC

This member is used to identify the out codes for datasets that you do not want Tape/Copy to select.

Format record layout:

1st field Any valid out code.

Statement coding rules:

- Only one out code may be listed per line.
- The out code may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLTLBL

This member is used to exclude volumes from processing by identifying the label type of volumes you do not want Tape/Copy to process during candidate selection.

Format record layout:

1st field Label type - Valid tape label values are: SL NL NSL SUL LTM AL1 AU1 AL3 AU3

Statement coding rules:

- Only one label type may be listed per line.
- The label type may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

EXCLVNDR

This member is used to exclude volumes from processing by identifying the tape vendor/manufacturer of volumes you do not want Tape/Copy to process during candidate selection. This member is used in conjunction with the PROCESS-VENDOR-INCLUDE/EXCLUDE-LISTS parameter.

Format record layout:

1st field Tape vendor/manufacturer

Statement coding rules:

- Only one tape vendor/manufacturer may be listed per line.
- The tape vendor/manufacturer may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

EXCLVOLS

This member is used to exclude volumes from processing by identifying the tape volume serial number of volumes you do not want Tape/Copy to process during candidate selection. A single volser, volsers masked with wildcard characters and/or a volser range may be listed.

Format record layout:

1st field Volser or volser range

Statement coding rules:

- Volser ranges must be in VVVVVV-VVVVVV format (beginning volser then hyphen then ending volser, with no embedded spaces), or single volser can be listed as VVVVVV.
- The volsers may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed for single volser entries, but not volser ranges.

EXCPJCL

This member contains the EXCP conversion job JCL model. If any of the JCL in this member does not meet your JCL needs, you can modify it to suit the installation.

FACTSETS

This member is currently not in use.

FDRJCL

This member contains the FDR conversion job JCL model. If any of the JCL in this member does not meet your JCL needs, you can modify it to suit the installation.

FORGNTPL

This member is currently not in use.

GENERJCL

This member is currently not in use.

GRPDSNS

This member provides a method for grouping non-GDG datasets together for stacking with conflict management using dataset names or naming patterns.

Format record layout:

1st field Dataset name or dataset naming pattern

Statement coding rules:

- Only one dataset name per statement
- Dataset name may start in any column
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

ICNTLTBL

This member is obsolete and is no longer used by Tape/Copy. It is only included for compatibility with older Tape/Copy releases. The IOCNTLTB is used to handle this member's function.

IDCAMJCL

This member is currently not in use.

INCLACT#

This member is used to exclusively include datasets in processing by identifying the account numbers of datasets you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Account number

Statement coding rules:

- The account number must look exactly the same way it does in the tape management system database.
- Only one account number may be listed per line.
- The entry may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLCRJB

This member is used to exclusively include datasets in processing by identifying the creating job name of datasets you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Creating job name

Statement coding rules:

- The creating job name must look exactly the same way it does in the tape management system database.
- Only one creating job name may be listed per line.
- The creating job name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLCRPG

This member is used to exclusively include datasets in processing by identifying the creating program name of datasets you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Creating program name

Statement coding rules:

- The creating program name must look exactly the same way it does in the tape management system database.
- Only one creating program name may be listed per line.
- The creating program name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLCRSN

This member is used to exclusively include datasets in processing by identifying the creating system name of datasets you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Creating system name

Statement coding rules:

- The creating system name must look exactly the same way it does in the tape management system database.
- Only one creating system name may be listed per line.
- The creating system name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLDSCJ

This member is used to exclusively include datasets in processing by identifying the dataset name/creation job name combination you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Dataset name

2nd field Creating job name

Statement coding rules:

- Only one dataset name/creation job name combination may be listed per line.
- The dataset name may begin in any column.
- The creation job name must follow the dataset name and be separated by at least one blank.
- The dataset name and creation job name must be in the same statement. Statement continuation is not supported.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLDSNS

This member is used to exclusively include datasets in processing by identifying the dataset names you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Dataset name

Statement coding rules:

- Only one dataset name may be listed per line.
- The dataset name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLDTYP

This member is used to exclusively include datasets in candidate selection processing by identifying the catalog device type on which the dataset is located. This member is used in conjunction with the PROCESS-CATALOG-DEVTYPE-INCLUDE/EXCLUDE-LISTS parameter.

Format record layout:

1st field Device type (8 hexadecimal characters)

Statement coding rules:

- Only one device type may be listed per line.
- The device type may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

INCLJOBS

This member is used to exclusively identify the Audit Log file records with conversion job names that you want Tape/Copy to list when generating an Audit Log Report.

Format record layout:

1st field Any valid Tape/Copy conversion job name

Statement coding rules:

- Only one conversion job name may be listed per line.
- The conversion job name may begin in any column.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

INCLMSGS

This member is used to exclusively identify the messages that you want Tape/Copy to list on the Dataset Rejection Report. This member is used in conjunction with the BYPASS-REJECTION-MESSAGE-PROCESSING parameter.

Format record layout:

1st field Any 5 character rejection message code (example: M0097)

Statement coding rules:

- Only one message code may be listed per line.
- The message code may begin in any column.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

INCLOUTC

This member is used to exclusively identify the out codes for datasets that you want Tape/Copy to select.

Format record layout:

1st field Any valid out code.

Statement coding rules:

- Only one out code may be listed per line.
- The out code in may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLTLBL

This member is used to exclusively include volumes in processing by identifying the label type of volumes you want Tape/Copy to process during candidate selection.

Format record layout:

1st field Label type - Valid tape label values are: SL NL NSL SUL LTM AL1 AU1 AL3 AU3

Statement coding rules:

- Only one label type may be listed per line.
- The label type may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

INCLVNDR

This member is used to exclusively include volumes in processing by identifying the tape vendor/manufacturer of volumes you want Tape/Copy to process during candidate selection. This member is used in conjunction with the PROCESS-VENDOR-INCLUDE/EXCLUDE-LISTS parameter.

Format record layout:

1st field Tape vendor/manufacturer

Statement coding rules:

- Only one tape vendor/manufacturer may be listed per line.
- The tape vendor/manufacturer may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

INCLVOLS

This member is used to exclusively include volumes in processing by identifying the tape volume serial number of volumes you want Tape/Copy to process during candidate selection. A single volser, volsers masked with wildcard characters and/or a volser range may be listed.

Format record layout:

1st field Volser or volser range

Statement coding rules:

- Volser ranges must be in VVVVVV-VVVVVV format (beginning volser then hyphen then ending volser, with no embedded spaces), or single volser can be listed as VVVVVV.
- The volsers may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed for single volser entries, but not volser ranges.

INITRTNS

This member is currently not in use.

IOCNTLBK

This member is used by the reformat/rebuild programs.

Warning This member should never be modified by the user.

IOCNTLTB

This member is reset and modified by the SETUP program using the IOCNTLTB_REBUILD request function. (A statement that shows the date of the most recent rebuild by the SETUP program is listed in the member comments). It lists the entries Tape/Copy requires to perform input dataset selection and output tape device targeting. These entries are a combination of user customized entries and Tape/Copy generated entries.

This member contains 5 sections for classifying the entries it contains. These sections are:

USER DEFINITIONS	All unique user entries that do not fall into any of the other 4 classifications. All entries in this section will be preserved during any member rebuild so that they do not have to be reentered when the IOCNTLTB member is rebuilt by Tape/Copy.
ROBOTIC LIBRARY NAMES	All entries that refer to a robotic library.
EDT GENERIC UNIT NAMES	All the generic unit names in the EDT (Eligible Device Table).
EDT ESOTERIC UNIT NAMES	All the Esoteric unit names in the EDT (Eligible Device Table).
OPENTECH DEFAULTS	These are unique entries Tape/Copy uses for general candidate selection and tape device targeting. Entries for non installed tape devices are also recorded here to be used by Tape/Copy when forecasting tape usage prior to the installation of higher capacity tape devices.

The format of each of the above sections is described on the next few pages.

Format record layout:

1st field MEDIA TYPE - This is the name by which Tape/Copy identifies the device allocation characteristics for input candidate selection and input and output tape device targeting for conversion. This field directly relates to the Media Type: Input/Output: selection criteria on the Tape/Copy ISPF panels.

Options

- A user/system given name to describe the media being defined. This will be the name that you use on the Tape/Copy ISPF panels to refer to the device type (in the input and output media type fields).
- ALL - this entry (included in the member by default), is translated for each input candidate tape dataset to the definition that matched its TRTCH (e.g. 9TRK=009, 18TRK=018, etc.).
- ASIS - this entry (included in the member by default), is translated for each input candidate tape dataset to the definition that matched its TRTCH (e.g. 9TRK=009, 18TRK=018, etc.).

2nd field M/R/V - This indicates if the media type refers to (M)anual, (R)obotic or (V)irtual tape volumes. If Tape/Copy is unable to determine the manual/robotic/virtual status of the media type or the media type encompasses multiple status's, an asterisk (*) is used.

Options

- M - indicates that this definition uses manual tape drives.
- R - indicates that this definition uses robotic tape drives.
- V - indicates that this definition uses virtual tape drives.

3rd field I/O - This indicates if the media type is used exclusively for input or output determinations.

Options

- I - indicates that this definition is used as an input media type only
- O - indicates that this definition is used as an output media type only
- B - indicates that this definition can be used as an input or output media type

4th field UNIT NAME - This defines the value to use in the UNIT= JCL parameter when building the tape drive DD statements for the conversion process.

Options

- =unitname - specify a generic/esoteric unit name from the valid unit names genned into the eligible device table (EDT).
- @unitname - specify a generic/esoteric unit name not genned into the eligible device table (EDT).
- ucb - specify the actual UCB device address to be used.

5th field DATACLAS - This defines the value to use in the DATACLAS= JCL parameter when building the tape drive DD statements for the conversion process.

Options

- N/A - Not applicable
- dataclas - SMS data class name

6th field STORCLAS - This defines the value to use in the STORCLAS= JCL parameter when building the tape drive DD statements for the conversion process.

Options

- N/A - Not applicable
- storclas - SMS storage class name

7th field MGMTCLAS - This defines the value to use in the MGMTCLAS= JCL parameter when building the tape drive DD statements for the conversion process.

Options

- N/A - Not applicable
- mgmtclas - SMS management class name

8th field TAPE NAME - This refers to a table called TAPENAME, see the documentation for the PARMLIB member TAPENAME, which in turn describes the media capacity characteristics for the tapes that are associated with this media type selection.

9th field REBLD - This is a flag indicator telling Tape/Copy whether it can rebuild this entry when the IOCNTLTB_REBUILD process of the SETUP job is performed.

Options

- Y - Tape/Copy is allowed to delete/rebuild this entry (User Definition entries are kept even if the REBLD field is set to Y)
- N - Tape/Copy must bypass the rebuilding of this entry and preserve the entry in the resultant IOCNTLTB member during the IOCNTLTB_REBUILD processing

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

ISPFFACT

This member contains the default values that are passed to the Tape/Copy-VDR ISPF dialog options. Those values are then superceeded by any values in USERSETS.

Warning This member should never be modified by the user.

ISPFSETS

This member is used by Dual Copy Recovery to identify any parameters whose values change only for recovery purposes. The parameters in this member are set to override the parameter values from PARMLIB member USERSETS in ISPF dialog program. This member should list any parameters that should be set to a different value in online programs than is stored in USERSETS for all programs (online and batch). The parameter

formats in this member are the same as the formats in the DEFAULTS load module and USERSETS member.

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

ISPFXREF

This member contains the ISPF variable processing table.

Warning This member should never be modified by the user.

JOBSTMTS

This member contains the JCL job card for the candidate conversion jobs. This may be altered to meet your data center requirements.

LABLTYPE

This member is currently not in use.

Warning This member should never be modified by the user.

LIBRYDEF

This member is used as a way to differentiate between a real automated tape library and a virtual tape library environment by listing all robotic tape library names (both real and virtual) along with the tape library's identifying characteristics.

Format record layout:

1st field LIBRARY INTERFACE - This is the name of the tape library software interface and release level. Valid options are listed in the ATLDRVRS member of PARMLIB.

2nd field Additional parameters - This field supports two keyword parameters.

- LOADLIB= specifies the load library name where the API load module resides. If the load library is in the link list, LINKLIST may be specified rather than the actual load library name. If this parameter is omitted, LINKLIST is assumed.
- DATABASE= specifies the name of the tape database used by the library API. Usually the API dynamically knows the name of this database so this parameter may not be required.

If both of these parameters are required, the library interface name (from the 1st field) must be repeated in the first column of both records in order to tie the two statements together.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.
- Wildcards are not allowed.

LIBRYDNW

This member is currently not in use.

LOSTVOLS

This table is used for tracking missing tape volumes. If a tape is selected for processing by candidate selection but cannot be located when the tapes on the Pre-Pull Listing Report are pulled, the volser can be added to this member before the conversion job is released. The volsers in this member will be excluded from further Tape/Copy processing. If the missing tape is part of a multi-volume chain, you will only need to enter the missing volser. Tape/Copy will drop the entire volser chain if any of its volumes are missing.

Format record layout:

1st field Volser

Statement coding rules:

- The volser must look exactly the way it does in the tape management system database.
- The volsers may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

A Lost Tape Volumes Report will be generated by each candidate selection job (unless the LOST-VOLUMES-REPORT parameter is set to NO) to indicate the contents of this member. If a tape volume that has been added to this member has been located, the table entry for that volser may be deleted from this member so that it is no longer excluded from processing.

MODDSNS

This member is used to identify those datasets that you want to be last on a stacked tape so that they may be modified by a job if necessary. Tape/Copy's Stacking Conflict Avoidance process will automatically update this member with any datasets that it finds with a DISP=MOD. Datasets can also be added to this member by the user manually.

Format record layout:

1st field Dataset name

Statement coding rules:

- Only one dataset name may be listed per line.
- The dataset name may start in any statement column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.

NEWNAME

This member is used to select tape datasets for standard newname processing.

Format record layout:

1st field Current Dataset name (original dataset name) or pattern

2nd field New Dataset name

Statement coding rules:

- Only one set of dataset name criteria may be listed per line.
- The dataset name fields may begin in any column of the record.
- Anything beyond the second field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.
- Statement continuation is allowed using the '-' character (X'60')

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

NEWNAUTO

This member is used to select tape datasets for auto newname processing.

Format record layout:

1st field Current Dataset name (original dataset name) or pattern

2nd field Prefix to be used when generating automatic newname

Statement coding rules:

- Only one set of prefix specification criteria may be listed per line.
- The fields may begin in any column of the record.
- Anything beyond the second field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.
- Statement continuation is allowed using the '-' character (X'60')

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

NOTIFY

This member is used to define which user ids should be alerted when any/all Tape/Copy jobs complete.

Format record layout:

1st field Any valid user id.

Statement coding rules:

- Only one user id may be listed per line.
- The user ids may begin in any column of the record.
- Anything beyond the first field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

OCNTLTBL

This member is obsolete and is no longer used by Tape/Copy. It is only included for compatibility with older Tape/Copy releases. The IOCNTLTB is used to handle this member's function.

OTMSGID

This member is used to override the issuance of most WTO messages and/or the condition code associated with them, and/or the WTO routing and descriptor codes.

Format record layout:

1st field Message ID

2nd field Condition code for the message

3rd field Suppression indicator

4th field Routing codes

5th field Descriptor codes

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Only one message ID may be listed per line.
- Fields are delimited by blanks and can begin anywhere.
- The first three fields are required. The fourth and fifth fields are optional.
- The message ID must be one to eight characters, including wild cards. Only the first eight characters of the message ID are matched. The first entry that matches the message ID is used.
- The condition code must be a decimal value from 0 to 4095 or an asterisk (*) to indicate no override. For a message that is suppressed, an asterisk is the same as specifying 0. The condition code will be set regardless of the suppression indicator.
- The suppression indicator can be Y or YES, indicating that the message is to be suppressed; or N or NO, indicating that the message is to be written.
- Entries for a message that result in an immediate ABEND will be ignored.
- Routing codes are optional. If specified, it must be an asterisk (*), indicating no override or a list of comma separated routing codes from 1 to 16.
- Descriptor codes are optional. If specified, it must be an asterisk (*), indicating no override or a list of comma separated descriptor codes from 1 to 16.
- The routing and descriptor code fields are ignored when the suppression indicator is Y or YES.

OTTCBNNR

This member contains the OpenTech Tape/Copy banner.

Warning This member should never be modified by the user.

OUTOAREA

This member is no longer in use. This members function is provided by the EXCLOUTC and INCLOUTC members.

Warning This member should never be modified by the user.

PGMSETS

This member is intended to serve as a default PARMLIB member, when the PGMSETS DD name has not been specified in Tape/Copy JCL to provide parameter values that should override the USERSETS and DEFAULTS parameter settings. This member can be used to pass parameter values to programs that do not have a PGMSETS DD name listed in the JCL (allocated to a TSO user).

PROPRIET

A proprietary dataset format is a special file format primarily used by software vendors. These special formats usually have some restriction associated with them that makes these datasets difficult to move freely. This member provides the mechanism for identifying these special formats. Edit this member to add/change any of the identification criteria statements.

Format record layout:

1st field	Proprietary data format (1 - 16 characters)
2nd field	Dataset name (1-44 characters w/ wildcards)
3rd field	Creation job name (1 - 8 characters w/ wildcards)
4th field	Creating program name (1 - 8 characters w/ wildcards)
5th field	Dataset LRECL (1 - 5 numeric characters)
6th field	Dataset BLKSIZE (1 - 5 numeric characters)
7th field	Dataset RECFM (1 - 3 alphabetic characters)
8th field	Select if dataset is cataloged (Y or N or '/'=either)
9th field	Process these datasets (Y or N)

Statement coding rules:

- Identification will be performed in the order the criteria is entered in this member. This first criteria that matches a dataset will be used for proprietary identification purposes. Do not create ambiguous situations that cause misidentification when entering criteria into this table.
- More than one identification criteria may be entered for proprietary data format.
- Anything beyond the ninth field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.
- A slash (/) in a field means accept any value for that field.

Warning If a proprietary dataset file format is not correctly identified by this member, either the Tape/Copy conversion jobs will fail with some variety of open error or system abend or unpredictable results from the use of the moved tape may occur. If you are unsure of how to customize this member, please contact Technical Support.

PROPRINW

This member is currently not in use.

PROPSUPP

This member is currently not in use.

RBLKRULE

This member contains the rules for creating a Reblocking Rules Table.

Format record layout:

1st field	RULE or VERB- This is the rule logic modifier column.
2nd field	COMPARE FIELD - This is the name of the tape management database field that will be tested against the specified criteria.
3rd field	OP - This is the comparison operand.
4th field	COMPARE DATA - This is the data that will be tested against the tape management database records.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note See Chapter 16 for complete information on the Reblocking facility and building a Reblocking Rules Table.

RECFMT

This member is currently not in use.

Warning This member should never be modified by the user.

RPTALLOC

This member is used to redirect the sysout from the specified for selected programs to either dasd datasets or sysout datasets with other than the default criteria.

The structure of this table is field oriented with the individual fields separated by blanks, invalid entries are displayed via wto msg on the console and ignored.

The table layout is described below:

```
*
* RPTALLOC
*
*  COPYRIGHT (C) OPENTECH SYSTEMS, INC., 2009.
*  ALL RIGHTS RESERVED.
*
**********************************************************************
*
* TABLE ENTRY COLUMN DESCRIPTIONS:
*
* AN '*' IN COLUMN 1 INDICATES A COMMENT.
*
* STATEMENT CONTINUATION IS NOT PERMITTED.
*
*
* FIELD  1 - JOBNAME TO HAVE ITS SYSOUT REQUEST REDIRECTED, THE
*            SPECIFIED JOBNAME MAY HAVE WILDCARD CHARACTERS TO
*            PERMIT JOBNAME SCROLLING, SEE THE USERS GUIDE FOR
*            PRODUCT BEING USED FOR INFORMATION ON JOBNAME
*            SCROLLING AND THE USAGE OF WILD CARD CHARACTERS
*
* FIELD  2 - PROGRAM NAME
*
* FIELD  3 - DDNAME
*
* WHEN THE SYSOUT FOR THE ABOVE JOBNAME, PROGRAM NAME AND DD NAME
* IS TO BE REDIRECTED TO A DASD DATASET THE FOLLOWING VALUES
* MUST BE CODED IN THE INDICATED COLUMNS, THE FIELDS ARE SEPARATED

* BY BLANKS.
*
* FIELD  4 - 0 TO INDICATE SEQUENTIAL DATASET, 1 - 255 TO INDICATE
*            GDG DATASET AND THE NUMBER OF GDG LEVELS.
*
* FIELD  5 - PRIMARY ALLOCATION IN CYLINDERS IN THE RANGE OF 1 - 9999
*
* FIELD  6 - SECONDARY ALLOCATION IN CYLINDERS IN THE RANGE OF 1 - 9999
*
*  NOTE: EACH PRIMARY AND SECONDARY CYLINDER ALLOCATED WILL HOLD 6300
*        PRINT LINES OR 105 PAGES @ 60 LINES PER PAGE
*
* FIELD  7 - VOLUME COUNT IN THE RANGE OF 1 - 59
*
* FIELD  8 - SMS DATA CLASS OR THE WORD: NONE
*
* FIELD  9 - SMS MANAGEMENT CLASS OR THE WORD: NONE
*
* FIELD 10 - SMS STORAGE CLASS OR THE WORD: NONE
*
*
* WHEN THE SYSOUT FOR THE ABOVE JOBNAME, PROGRAM NAME AND DD NAME
* IS TO BE REDIRECTED TO SYSOUT, THE SYSOUT STATMEMNT MAY BE
* CODED AS:
*
*
* FIELD  4   SYSOUT=A-Z|0-9|*|$                 CLASS
*            SYSOUT=(A-Z|0-9|*|$)                CLASS
*            SYSOUT=(A-Z|0-9|*|$,XXXX)           CLASS & FORM NAME
*            SYSOUT=(A-Z|0-9|*|$,,YYYYYYYY)      CLASS & WRITER
*            SYSOUT=(A-Z|0-9|*|$,XXXX,YYYYYYYY) CLASS FORM NAME & WRITER
*
* NOTE: WHEN SYSOUT=* IS SPECIFIED, THIS IS WILL RESULT IN NO
*       REDIRECTION DUE TO THAT THE FACT THAT THE DEFAULT SYSOUT CLASS
*       IS *
*
*JOB      PROGRAM  DD       GDG PRI  SEC  VOL DATA     MGMT     STOR
*NAME     NAME     NAME     LIM CYL  CYL  CNT CLASS    CLASS    CLAS
*======== ======== ======== === ==== ==== === ======== ======== ========
*
 OT?????? OTTCCAND CANDRPT  007 0001 0001 001 NONE     NONE     NONE
 OT?????? OTTCCAND CEXPDTRP 007 0001 0001 001 NONE     NONE     NONE
 OT?????? OTTCCAND FCASTDTL 007 0001 0001 001 NONE     NONE     NONE
 OT?????? OTTCCAND REJRPT   007 0001 0001 001 NONE     NONE     NONE
 OT?????? OTTC0023 DCINVRPT 007 0001 0001 001 NONE     NONE     NONE
*
 OT?????? OTTC0023 RULESRPT SYSOUT=A
```

RPTRTNS

This member is currently not in use.

SAMP1

This member is used to define DASD generic pool volumes.

Warning This member should never be modified by the user.

SARJCL

This member contains the SAR archival tape dataset conversion job JCL model. If any of the JCL in this member does not meet your JCL needs, you can modify it to suit the installation.

SORTJCL

This member is currently not in use.

STKCNTL

This member is used to define the Stack Control File prefixes used when creating stacked tapes with the Stack Management Control feature. The prefixes should be entered here so that the Stack Management Control clean-up utility can identify which tapes are being managed by this feature.

TABLEDEF

This member contains table definitions.

Warning This member should never be modified by the user.

TAPENAME

This data is no longer stored in PARMLIB; however the values are listed here for reference.

```
 TAPE          PHYSICAL      COMPACTION
+-NAME-+        CAPACITY      +-RATIO--+
3420               160          1.0
3480               200          2.5
3490               400          2.5
3490-XL            800          2.5
VTS                400          3.0
VTS-XL             800          3.0
VTS-1G           1,000          3.0
VTS-2G           2,000          3.0
VTS-4G           4,000          3.0
3590B           10,000          3.0
3590B-XL        20,000          3.0
3590E           20,000          3.0
3590E-XL        40,000          3.0
RDWD12          12,500          3.0
RDWD25          25,000          3.0
RDWD50          50,000          3.0
9840            20,000          3.5
VSM                400          3.5
VSM-XL             800          3.5
3590H           30,000          3.0
3590H-XL        60,000          3.0
3592J           30,0000         3.0
9940            60,000          3.5
3592J-S         60,000          3.0
9840C           40,000          3.5
9940B          200,000          3.5
3592E          500,000          3.0
3592E-S        100,000          3.0
3592E-XL       700,000          3.0
T10000         500,000          2.0
35923E         640,000          3.0
35923E-S       128,000          3.0
35923E-X     1,000,000          3.0
T10000S        120,000          3.0
T10000B      1,000,000          3.0
T10000BS       240,000          3.0
9840D           75,000          3.5
T10000C      5,000,000          3.0
T10000CS     1,000,000          3.0
```

TCAUDRJC

This member contains the JCL job card for the Audit Log Report jobs created by Tape/Copy. This may be altered to meet your data center requirements.

TCCANDJC

This member contains the JCL job card for the candidate selection jobs created by Tape/Copy. This may be altered to meet your data center requirements.

TCCONVJC

This member contains the JCL job card for the conversion jobs created by Tape/Copy. This may be altered to meet your data center requirements.

TCINVRJC

This member contains the JCL job card for the Dual Copy Inventory Reporting jobs created by Tape/Copy. This may be altered to meet your data center requirements.

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

TCUNDOJC

This member is currently not in use.

Warning This member should never be modified by the user.

TCVCUPJC

This member contains the JCL job card for the Dual Copy Clean-up jobs created by Tape/Copy. This may be altered to meet your data center requirements.

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

TCVRVYJC

This member contains the JCL job card for Dual Copy Recovery jobs created by Tape/Copy. This may be altered to meet your data center requirements.

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

TMSDRVRS

This member is currently not in use.

UCBDTYPE

This member allows users to specify their UCB device types and the associated generic names for their EMC devices. (Several default values are specified.)

Format record layout:

1st field	UCB device type (e.g. 78048081)
2nd field	Catalog generic name (e.g. 3490)

Statement coding rules:

- The device type must be 8 hexadecimal characters as displayed by IDCAMS LISTCAT.
- The generic can be from 1 to 8 characters in length.
- Anything beyond the second field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are not allowed.

UNCMPRUL

This member contains the rules table that is used to define the un-compression multiplication values to be used to modify the calculated files during the Candidate Selection process.

Format record layout:

1st field	RULE or VERB- This is the rule logic modifier column.
2nd field	COMPARE FIELD - This is the name of the tape management database field that will be tested against the specified criteria.
3rd field	OP - This is the comparison operand.
4th field	COMPARE DATA - This is the data that will be tested against the tape management database records.

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Statement continuation is not allowed.

Note See Chapter 10 for complete information on this feature and how to define the rules table.

USERSETS

This member allows users to override Tape/Copy's default settings.

Format record layout:

1st field Tape/Copy parameter, followed immediately by a colon (:).

2nd field Valid parameter value

Statement coding rules:

- Parameter value listed must be valid for the parameter. Valid values for each parameter can be found in the Tape/Copy "Parameter Reference Guide".
- Anything beyond the second field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards may or maybe not be allowed (based on valid values for the parameter)..

VDRAVAIL

This member is used to select tape datasets for Dual Copy processing using VDR for data availability.

Format record layout:

1st field Current Dataset name (original dataset name) or pattern

2nd field New Dataset name (Dual Copy backup name)

Statement coding rules:

- Only one set of dataset name criteria may be listed per line.
- The dataset name fields may begin in any column of the record.
- Anything beyond the second field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.
- Statement continuation is allowed using the '-' character (X'60')

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

VDRDRCVY

This member is used to select tape datasets for Dual Copy processing using VDR for disaster recovery.

Format record layout:

1st field Current Dataset name (original dataset name) or pattern

2nd field New Dataset name (Dual Copy backup name)

Statement coding rules:

- Only one set of dataset name criteria may be listed per line.
- The dataset name fields may begin in any column of the record.
- Anything beyond the second field will be treated as comments.
- An asterisk (*) in column 1 indicates a comment.
- Wildcards are allowed.
- Statement continuation is allowed using the '-' character (X'60')

Note This member only applies to customers who have Virtual Data Recovery (VDR) authority. See the "Virtual Data Recovery (VDR) Guide" for more information on VDR.

VOLMEDIA

This member will permit the user to override the Opentech provided values for tape media.

Each record in this member specifies a volser, volser with wildcard characters or a volser range and a tape media value to be applied to the volser information specified.

Format record layout:

OPRND 1	Volser, Volser Pattern, or Volser Range
OPRND 2	Tape Media Value (as defined by the tapename table)

Statement coding rules:

- An asterisk (*) in column 1 indicates a comment.
- Only 1 volser or volser range per statement.
- The volser or volser range must start in statement column 1.
- Anything beyond the 2nd OPRND will be treated as comments.
- Volser ranges must be delimited by a single - between the first volser and the second volser.
- The minimum length of a single volser is 1 and the maximum length is 6
- For volser ranges each volser must be 6 bytes in length
- The tape media value length is 1 byte and must be followed by at least 1 blank

Note Wildcard characters are permitted for single volsers but not volser ranges.

D SYSOUT Report DDs

TOPICS COVERED IN THIS APPENDIX

Reports (page D-2)

Reports

The table on the following pages contains a list of the reports produced by Tape/Copy (and the optional VDR feature). This information can be used to determine which reports can be printed to a dataset using a DD override.

If the Override column is set to Y, then the report DD can be overridden (i.e. -the report can be sent to a dataset). If the Override column is set to N, the report DD cannot be overridden.

If the report generation is controlled by a Tape/Copy parameter, the parameter name is provided.

Report	Override	DD name	Related Parameter (if any)
ACS SMS Report	Y	ACSRPT	
AFM Build Duplicate Volser/ Fileseq Report	Y	AFMDUPS	
ATL Library Name Report	Y	ATLNMRPT	
Audit Log Conversion Report Audit Log Rename Report	Y	AUDLGRPT	
Bad Media Report	Y	BADTPRPT	BAD-MEDIA-REPORT
RMM Batch Update Records	Y	BATCHJOB	
Candidate Dataset Listing Report	Y	CANDRPT	CANDIDATE-SELECTION-REPORT
Auto Newname Converter Candidate Report	Y	CCONVRPT	
Calculated Expiration Date Errors	Y	CEXPERRP	
Calculated Expiration Date Report	Y	CEXPDTRP	
Creating Job Name Frequency Report	Y	CJOBNAME	
Control Card Report	Y	CNTLCARD	
Conversion Report	Y	CONVRPT	CONVERSION-REPORT
Conversion Report for Output 2	Y	CONVRPT2	DUPLEX-NEWNAME-TABLE
Copy Operation Performance Summary Report	N	COPYPERF	
Creating Program Name Frequency Report	Y	CPGMNAME	
VDR Dual Copy to DBS Bridge File Update Report	Y	DBSBRRPT	
Dual Copy Inventory Report	Y	DCINVRPT	

Report	Override	DD name	Related Parameter (if any)
Diagnostic Reports	Y	DIAGRPT	
Dual Copy Utilization % Report	Y	DCPCTRPT	
DMS/CA-Disk Update Report	Y	DMSUPSPT	
Dataset Analysis Report	Y	DSETANL1 DSETANL2	
Dataset Compare Report	Y	DSETCOMP	
Data Set Name Frequency Report	Y	DSETNAME	
Auto Newname Converter Rename Report	Y	DSRENRPT	
Dual Copy Tape Library Report	Y	DUALCOPY	DUALCOPY-TAPE-LIBRARY-REPORT
Conversion Job Encryption Report	Y	ENCRPRPT	
Exception Report	Y	EXCEPTRP	
EXCP Analysis and Performance Report	N	EXCPDATA	EXPIRE-WHEN-FORCING-OUT-OF-SERVICE
EXCP Diagnostic Report	N	EXCPDIAG	
Stack Management Cleanup Expiration Report	Y	EXPSTKRP	
Dual Copy File Expiration Report	Y	EXPIRERP	
Tape Conversion Forecast Detail Report	Y	FCASTDTL	CONVERSION-FORECAST-DETAIL-REPORT
Input/Output Filter Tables Report	Y	FILTRPT	
Tape Conversion Forecast Report	Y	FORECAST	CONVERSION-FORECAST-REPORT
HSM Update Report	Y	HSMUPRPT	
Setup Utilities Report	Y	INITRPT	
Input/Output Allocation Control Table Report	Y	IOCNTLRP	
Input/Output Allocation Control Backup Report	Y	IOCNTBK	
Binding Date and Time Report	Y	LISTBNDO	
Maintenance Level Report	Y	LISTIDRO	
Lost Volumes Report	Y	LOSTVRPT	LOST-VOLUMES-REPORT
Open/Mount Information Report	Y	MOUNTRPT	

Report	Override	DD name	Related Parameter (if any)
Master Pull List Report	Y	MSTRLIST	TAPE-PRE-PULL-REPORT
Recover Overwritten Datasets Report	Y	OVERRPT	
Parameter Summary Report	Y	PARMSUMM	PARAMETER-SUMMARY-REPORT
Pre-Edit/Pre-Filter Report	Y	PFILRPT	
Tape Pre-Run Pull List	Y	PULLLIST	TAPE-PRE-PULL-REPORT
Dual Copy Recovery Report	Y	RECVYRPT	
Data Set Rejection Report	Y	REJRPT	DATASET-REJECTION-REPORT
Data Set Rejection Summary Report	Y	REJSUMRY	DATASET-REJECTION-SUMMARY-REPORT
Data Set Rename Report	Y	RENAMRPT	
Dual Copy Restore Report	Y	RESTRRPT	
RMM API failure error information	Y	RMMUPRPI	
RMM API failure error information	Y	RMMUPRPT	
Report Selection Report	Y	RPTRPT	
Co-Location Report and Rules Processor Report (used by Reblocking Rules, Copy Rules and Disk Rules)	Y	RULESRPT	
Scratch Report	Y	SCREPORT	
Skipped Block Report	Y	SKIPBLK	
Conversion Statistics Report	Y	STATSRPT	CONVERSION-STATISTICS-REPORT
Conversion Job Trigger Member Activity/Status	Y	TRIGGRPT	
Unknown Media Report	Y	UNKMEDIA	
Dual Copy VDRMOD Pre-Copy Report	Y	VDRMODRP	
Volset Analyze/Compare Report	Y	VOLSETRP	

E Frequently Asked Questions

TOPICS COVERED IN THIS APPENDIX

Frequently Asked Questions (page E-2)

Frequently Asked Questions

This chapter answers the following “frequently asked questions”.

- What data formats can Tape/Copy move & copy?
- What process can I use to see if a particular data format can be copied using Tape/Copy?
- Can Tape/Copy process tapes that are not in my tape management database?
- How can we suppress the “pull list ready” WTOR?
- How can I resolve space abends on Tape/Copy work files?
- Why didn’t Tape/Copy restore the catalog entries when the conversion failed after my TMC audit file filed up?
- Which Tape/Copy files and libraries should my data center back up for disaster recovery purposes?
- How can I save the Candidate Selection job JCL that is created through the Mass Copy Tape/Copy ISPF panels so that I can put it in my job scheduler to run daily?
- How can I make sure Tape/Copy always “ignores” a certain tape range?
- Can I create the selection reports without the creating conversion JCL too?
- How can I find out why my datasets weren’t selected?
- My data center is upgrading to a new CPU. What steps do I need to follow to make sure that Tape/Copy will work on the new CPU?
- What method can I use to schedule my Tape/Copy conversion jobs in my job scheduler?
- How can I use Tape/Copy to stack datasets by retention date?
- Can I override the location of the reports? Where are the DD names?
- Can Tape/Copy add data to the end of a previously stacked tape?
- What procedure should be followed to restart a failed conversion job or a conversion job that was halted using the Tape/Copy Console Command Interface?
- I’ve noticed that when I have a Tape/Copy conversion failure, Tape/Copy issues messages telling me that the it has recovered. However, the output tape from the failed conversion is still in my tape management system as if the copy was completed. Why?
- Can Tape/Copy be set to override the ACS routines?
- Are there any tips for minimizing manpower, mistakes and time when converting tapes that are located in the manual racks (not in an ATL)?
- Is it possible to add a step to the end of the candidate selection JCL and the conversion JCL?

What data formats can Tape/Copy move & copy?

Tape/Copy's internal EXCP data movement engine can successfully copy any tape dataset that is recorded in the tape management system's catalog. However, if the original dataset was created by a program product that records the volser locations of the datasets that it creates in its own internal database, Tape/Copy should not be used to move those datasets as the program product will think that the dataset that Tape/Copy moved is still on the original tape (with a few exceptions).

Warning See Chapter 5, "Processing Proprietary Data Formats" for more information.

What process can I use to see if a particular data format can be copied using Tape/Copy?

1. Find a specific tape volume that contains data created by the program product you'd like to verify.
2. Use Tape/Copy's Copy on Demand feature (See Chapter 28 for instructions on using Copy on Demand) to COPY (not MOVE) the volser making sure to select CATALOG in the "Cataloging Option" field. The Copy on Demand process will create a Tape/Copy job to copy the volser containing the program product's data and it will catalog the new output volser (without expiring the original volser).

   It may also be necessary to alter the set up of the PROPRIET member of the Tape/Copy PARMLIB library to allow the volser to be copied using the INTERNAL Tape/Copy conversion engine.
3. Execute a function within the program product that will cause the volser to be accessed. If the program product accesses the new volser, Tape/Copy can be used to process this type of tape using a MOVE or COPY function.

   If during this test the program product tries to access the original volser instead of the Tape/Copy created tape, then it is not using the system catalog and tapes from this program product should not be moved by Tape/Copy. If this is the case, you can simply recatalog this "test" volser back to its original tape volser.

Can Tape/Copy process tapes that are not in my tape management database?

No. Tape/Copy requires that a record is in the tape management database for every tape it processes as input.

How can we suppress the WTOR that gets generated to tell us that the conversion pre-pull reports are available (message OT000015I and OT000016A)? its an inconvenience to have to reply to this WTOR for the job to end.

The SUPPRESS-PULLLIST-REPORT-READY-WTOR parameter controls the generation of these messages. This parameter can be set to suppress the WTOR by using the Generate Candidate Tape Pre-Pull WTOR field on the Candidate Job Parameters ISPF panel (the section panel that appears when using the Mass Copy or ACS Copy options on the Tape/Copy Primary Selection panel). Set the Generate Candidate Tape Pre-Pull WTOR field on the panel to NO to prevent the WTOR from being issued. The conversion jobs created then will not require a WTOR response before completing.

I am receiving space abends on my Tape/Copy work datasets (such as OT.TAPECOPY.TMCDUMP, etc.). How can I resolve these abends?

- Add use the Pre-filter Scratches option on the Candidate Job Parameters panel, or add the desired PRE-EDIT-REJECTIONS parameter to the PGMSETS DD of the Candidate Selection JCL. (See the parameter description in the Tape/Copy "Parameter Reference Guide" for more information on using the PRE-EDIT-REJECTIONS options).
- All the DELETE-WORK-DATASET-WHEN-FINISHED: YES parameter to the USERSETS member or to the PGMSETS DD in the candidate selection JCL. This will cause Tape/Copy to delete the work files (.TMCDUMP, .TMCDUMP.SORTED, etc.) when it is finished with them. With this parameter set to YES, you only need enough space for two copies of the tape management system at any one time, rather than several copies.
- The DYNAMIC-ALLOCATION-SPACE-UNIT-TRACK-LIMIT parameter can be used to set the absolute maximum track allocation that Tape/Copy will request. If the space problem is fragmentation related, adjusting this parameter may help.
- The DYNAMIC-ALLOCATION-DATA-CLASS parameter can be used to point to an SMS DATACLAS that specifies multiple volumes. This will cause Tape/Copy work files to be created as multi-volume disk files. The DYNAMIC-ALLOCATION-SPACE-UNIT-TRACK-LIMIT should be set in conjunction with this option to force Tape/Copy to request less space than it thinks it will need since Tape/Copy will try to allocate the full amount of space it thinks it needs in a single extent.
- As a final option, Tape/Copy provides a means of allocating its work files to tape instead of DASD. This option is only intended for users who do not and will not ever have enough DASD space for the Tape/Copy work files, and also have spare virtual tape available since each work file would be allocated to a separate tape volume. To use this option, set the ALLOCATE-LARGE-WORK-FILES-AS parameter to TAPE in the USERSETS member and use the following additional parameters to target the tape allocation:
  - DYNAMIC-ALLOCATION-TAPE-DATA-CLASS
  - DYNAMIC-ALLOCATION-TAPE-MANAGEMENT-CLASS
  - DYNAMIC-ALLOCATION-TAPE-STORAGE-CLASS
  - DYNAMIC-ALLOCATION-TAPE-UNIT
  - DYNAMIC-ALLOCATION-TAPE-VOLSER

  This option currently only applies to CA-1, Control-T and RMM users. See the parameter description in the Tape/Copy "Parameter Reference Guide" for more information on using the ALLOCATE-LARGE-WORK-FILES-AS parameter.

During one of my Tape/Copy conversion jobs my tape management system's audit file filled up causing the conversion job to abend. The conversion report stated that the conversion was unsuccessful, however the datasets are now cataloged to the output tape instead of the input tape. Why didn't Tape/Copy restore the catalog entries if the conversion failed?

Tape/Copy and its ESTAE routine cannot continue under the conditions that exist when the tape management system's audit file fills up when updating the output records. When an abend of this sort occurs, the user will have to manually correct the catalog entries.

Which Tape/Copy files and libraries should my data center back up for disaster recovery purposes?

To have a fully functional backup of the Tape/Copy product, would need to have current copies of all of the Tape/Copy libraries, with the exception of the Tape/Copy INSTALL library.

Tape/Copy's work files can be recreated by a Candidate Selection job from a restored copy the tape management system, so those files (the .TMCDUMP files and the VOLCHAIN file) do not need to be backed up. The tape management system also needs to be current.

How can I save the Candidate Selection job JCL that is created through the Mass Copy Tape/Copy ISPF panels so that I can put it in my job scheduler to run daily?

Tape/Copy provides an option for saving the Candidate Selection JCL on the Candidate Job Parameters panel. Users can provide a pre-existing, fully qualified dataset name, or a provide new member name for a pre-existing PDS dataset, in the 'Save Candidate Job JCL to DSN=' field on the panel. Once Tape/Copy has created the Candidate Selection JCL, it will be displayed in ISPF edit mode on the screen and can then be submitted by the user. If you do not wish to submit the job at that time, you could also just save the JCL and hit PF3 to go back to the Tape/Copy ISPF panels. The Candidate Selection JCL would then be in the dataset you specified and could be run by your job scheduler.

My site has a range of volsers (X10000 - X99999) defined in the tape management system's database that I never want Tape/Copy to select or copy. How can I make sure Tape/Copy always "ignores" this tape range?

The tape volser range can be added to the EXCLVOLS member of the Tape/Copy PARMLIB. The EXCLVOLS member is used by the Tape/Copy Candidate Selection process each time it is run and any volsers defined in that member will be specifically excluded from Tape/Copy processing. The volser range you wish to exclude should be placed in the EXCLVOLS member as 'X10000-X99999' (without quotes and with no embedded blanks).

I want to review the reports that show which tapes Tape/Copy would select based on the parameters that I've set on the panels, but I don't want any conversion JCL to be created since I might need to modify the options I've selected. Can I create the reports without the creating conversion JCL too?

Yes. If you set the 'Generate Conversion JCL:' field on the Candidate Job Parameters panel to 'NO', Tape/Copy will create a Candidate Selection job that will select datasets and create all of the selection reports but will not generate any conversion JCL.

I ran a Tape/Copy Mass Copy Candidate Selection job, but the Candidate Dataset Listing Report says "No datasets were selected for processing". How can I find out why my datasets weren't selected?

The first thing you should always do when trying to find out why a dataset was not selected as a candidate is check for its volser on the Dataset Rejection Report. This report will assign any datasets that were not selected a rejection code and message. The rejection code can be found in the Tape/Copy "Messages & Codes Guide", which will tell you why the dataset was rejected and how (if possible) you can modify your job to select that tape.

If you cannot find the tape you think should've been selected in the Dataset Rejection Report and you have Pre-Filter options set to YES (or ENHANCED or CDTENH), the tape may have been omitted from selection and rejection processing because it matched a filter (whether it be Scratches, Tape Volser Range or Dataset Name). If you are unsure, you could rerun the selection job making sure the Pre-Filter options are turned "off" (set to NO on the Candidate Job Parameters panel) and review the reports again if it is not selected.

If after checking all of the above, the dataset is still not being selected and you feel it should be, please send a screen shot of the tape management database record for the volser/dataset along with a copy of the Candidate Selection job output to Technical Support. They will look at the information to try and determine why the tape is not being selected.

My data center is upgrading to a new CPU. What steps do I need to follow to make sure that Tape/Copy will work on the new CPU?

Before any CPU upgrade is performed, you should contact your Tape/Copy sales representative (or Technical Support if you are unsure of who the sales representative is) to see if there is an upgrade fee involved (as per your Tape/Copy sales agreement contract) and to receive a new Tape/Copy authorization code, if necessary.

What method can I use to schedule my Tape/Copy conversion jobs in my job scheduler?

Here are some suggested methods of using Tape/Copy with a job scheduling package.

Creating and submitting the Tape/Copy conversion jobs -

- Set up a job with IEBCOPY to create - replace the members of a JCLLIB that is controlled by the scheduler. These members would consist of dummy jobs (IEFBR14s) that would have the same names as the Tape/Copy conversion jobs (U9000600 - U90000610, for example). Schedule this job as the first step of the Tape/Copy set.
- Schedule the Tape/Copy Candidate selection job to run upon successful completion of this job.
- Set up an IEBCOPY to copy the conversion jobs generated by Tape/Copy to the JCLLIB used in step 1. This will replace the dummy members with the current conversions and the remaining unused JCLLIB members will be dummies.
- Schedule the submission of this job based on the completion of the Tape/Copy candidate job.
- Schedule the submission of the conversion jobs, from the updated JCLLIB, based on the completion of JCLLIB update.

Submitting other jobs based on the completion of the conversion jobs-

- One possibility is to schedule the submission of the next job based on the completion of all of the conversion jobs.
- Another possibility would be to schedule the next job based on a console message, WTO, or a Dataset creation by using the CNV-JOB-TRIGR-FUNCTIONS of Tape/Copy. This can be controlled by the CNV-JOB-TRIGR-ACTIONS parameter and related parameters. Review Chapter 14 for detailed information on using Conversion Job Triggering.

Note Since all job schedulers and data center requirements are different, Technical Support cannot provide you with specific instructions on scheduling your conversion jobs.

How can I use Tape/Copy to stack datasets by retention date?

A Co-Location table can be defined and used by Tape/Copy with the stack function to put datasets that have the same type of expiration/retention types together. There is a good example (Example 2) of a Co-Location table that could be used for this purpose in Chapter 21, "Co-Location Facility". This example may need to be modified depending on your specific needs.

In additional to the Co-Location feature, you would want to utilize the Candidate Sort Field option on the Stacked Output Options pop-up panel (which controls the STACKED-OUTPUT-SORT-FIELD parameter) set to EXPDT. This would cause Tape/Copy to stack the datasets in order by descending expiration date (so that the datasets with the higher expiration dates on first on the stack).

I want to direct Tape/Copy's reports to a dataset instead of the print queue but I don't see the DD names in the Candidate Selection JCL. Can I override the location of the reports? Where are the DD names?

See Appendix E for a table of the reports generated by Tape/Copy, find the corresponding DD name and code a DD override in the Candidate Selection JCL.

Can Tape/Copy add data to the end of a previously stacked tape?

No. Tape/Copy will always request a scratch tape for output from Tape/Copy conversion jobs.

What procedure should be followed to restart a failed conversion job or a conversion job that was halted using the Tape/Copy Console Command Interface?

If the conversion job you were running had DATA-COPY-FUNCTION set to MOVE, you can restart the failing job without making any modifications. The tapes that were already moved by Tape/Copy will be rejected with a M0229 rejection message and they will not be processed twice. If the failing tape has caused an abend due to an I/O error, its volser will automatically be added to the BADMEDIA member of PARMLIB and it will be excluded from further processing.

In a case where DATA-COPY-FUNCTION is set to COPY for your conversion, the input tapes are not flagged as "already processed" by Tape/Copy. Therefore, if a COPY job fails the user must edit the conversion job JCL and remove the cards for the datasets that have already been copied successfully before restarting the job.

It is imperative that the user verifies the tape management system record and catalog entries as being correct whenever a failure occurs. Tape/Copy will attempt to restore files

when an error occurs, but this information should also be manually verified to assure data integrity.

I've noticed that when I have a Tape/Copy conversion failure, Tape/Copy issues messages telling me that the it has recovered. However, the output tape from the failed conversion is still in my tape management system as if the copy was completed. Why?

Tape/Copy's recovery only attempts to restore the input tapes/files to their original status, it does not perform any actions against the output tapes/files. The output tape is not scratched just in case the recovery of the input tape would fail for some reason and the input tape were to get scratched. In the future, an option may become available to "clean up" these unused output tapes that were the result of a failed copy, but as of this time the user will need to review the failure manually, verify that the input tape was recovered successfully and scratch the unneeded output tape as desired.

When running my conversion jobs, the SMS ACS routines on my system are redirecting files to a media type other than the one I'm specifying as the Output Media Type in Tape/Copy. Can Tape/Copy be set to override the ACS routines?

Tape/Copy cannot "override" your ACS routines. You must modify your ACS routines so that when the executing program name begins with OTTC* (as all Tape/Copy conversion programs do), the ACS routines will honor the unit name, data class, management class and storage class specified in the JCL of the Tape/Copy conversion jobs.

Are there any tips for minimizing manpower, mistakes and time when converting tapes that are located in the manual racks (not in an ATL)?

1. Run a candidate selection job to select the tapes you desire to convert, specifying 'NO' in the Robotic Tapes field on the Candidate Selection panel. Make sure you tell Tape/Copy to generate a Candidate Tape Pre-Pull Report (on the Candidate Job Parameters panel).
2. Give the pre-pull lists to the tape operators to pull and insert into the ATL. Have the tape operators notify you when the tapes have been inserted.
3. Run another candidate selection job which the same selection criteria as the first EXCEPT specify 'ONLY' in the Robotic Tapes field on the Candidate Selection panel. (This will cause the tapes that were previously inserted into the ATL to be selected, but will reject any tapes that the tape operators were unable to find and put into the ATL).
4. Release the conversion jobs generated by the second candidate selection job to let the ATL handle all of the mounts for your manual tape conversion!

Is it possible to add a step to the end of the candidate selection JCL and the conversion JCL?

Yes. To add a JCL job step after the candidate selection JCL that normally generated by Tape/Copy, add the JCL for the job step to the OTTCCAS2 member of the Tape/Copy SKELS library. Tape/Copy will add the contents of that member to the end of the candidate selection JCL.

To add a job step to the end of the conversion JCL generated by Tape/Copy, add the job step JCL to the CNVS2JCL member of the Tape/Copy PARMLIB.

F Usage Examples

TOPICS COVERED IN THIS APPENDIX

Example 1 (page F-2)

Example 2 (page F-8)

Example 3 (page F-15)

Example 4 (page F-20)

Example 5 (page F-24)

Example 6 (page F-29)

Example 7 (page F-34)

Introduction

Tape/Copy is a product that can be customized and used countless ways. This section provides several examples of typical Tape/Copy uses that may or may not fit your environment. This is by no means a complete list and these examples may need to be altered for each individual data center's needs. The examples are provided to show the process of setting up the parameters and ISPF panels, and show the reports that may be generated based on the criteria specified.

Click on the text below to go to the example.

- Example 1 - Selecting tapes by their outcode (location id) and stacking to high capacity tape
- Example 2 - Stacking datasets by their calculated expiration dates onto ATL resident tapes
- Example 3 - Unstacking multi-file/multi-volume tapes into a virtual tape library
- Example 4 - Stacking virtual tape files that have not been used in 120 days onto high capacity tape
- Example 5 - Move datasets on media over 5 years old onto new tape media
- Example 6 - "Recycle" stacked tapes using the stacked output volume fitting options to control utilization of stacked output volumes
- Example 7 - The effects of various stacked file qualification options on candidate selection processing

Example 1

In this example we will demonstrate how to select tape files that have a specific outcode/ location id and move/stack them to a high capacity tape cartridge. Begin by selecting option '1' from the Primary Selection Panel, to start the Mass Copy dialog;

```
-------------------------  OpenTech Tape/Copy System  -----------------------
--------------------------  Primary Selection Panel  ------------------------
SELECTION ===> 1


  0  Parmlib          Modify Parameter Library
  1  Mass Copy        Multiple Tape Processing
  2  Copy on Demand   Fast Copy Single Datasets
  3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
  4  Audit Log Rpt    Generate Reports from the Audit Log File
  5  Tape Analysis    Perform analysis of tape file(s)
  6  Tape Compare     Compare tape files

  7  VDR Options      VDR Creation and Recovery Options









  PF3 to terminate Tape/Copy.
```

The first panel displayed by the Mass Copy dialog allows the user to specify the selection criteria, and the target media type. For this example we are copying the input media to high capacity output media, so we have specified 3590 in the “Media Type: Output:” field. For selection criteria we need to specify the outcode/location id that will limit the selection to the desired input tapes. To do this we have specified ‘OUTC’, for outcode, in the “Pattern Type” column and ‘I’ in the “Incl/Excl” column and a pds(member) in the “Dataset” column to identify the file that will list the outcode/location id that is to be selected. We also specified a “Pattern Type” ‘OUTC’, “Incl/Excl” ‘E’, and pds(member) to override the default inclusion outcode lists. All of the include/exclude lists have default members in the Tape/Copy PARMLIB. The default outcode inclusion member (TAPECOPY.PARMLIB(INCLOUTC)) is shipped with values that cause only tape files that are NOT outcoded to be selected. In this case we want those tapes to be excluded while selecting tapes outcoded to VLT1. We have specified ‘E’ for edit in the “Edit/Sel” column for both files so that we can update the pds members with the appropriate values for this run;

```
----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Selection  --------------------------
COMMAND ===>

Stacked File Qualification:   FIRST
(Process volume set if 1st file selected)

Dataset Size:    Min ___0 B          Max _100 G      Select on: GDG DSNs: YES_
Expiration Date: Min ________30      Max _____99999        Multi-Volume: YES_
Create Date:     Min _________0      Max _____99999       Stacked Files: YES_
Days Idle:       Min _________3      Max _____99999       Robotic Tapes: YES_
Volser Range:  From: $_____          To: 999999           Virtual Tapes: NO__
Media Type:   Input: ALL_____    Output: 3590____       Uncataloged DSNs: NO__
Label Format: Input: ALL         Output: ASIS            Expiration Type: NO__
Compression:  Input: ALL___      Output: COMP__           Volume Age/Use: NO__

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  E    OUTC     I    OT.TAPECOPY.PARMLIB(INCLVLT1)_____________________________
  E    OUTC     E    OT.TAPECOPY.PARMLIB(EXCLNVLT)_____________________________
  _    ____     _    ____________________________________________________________
  _    ____     _    ____________________________________________________________

ENTER to continue, PF3 to exit.
```

In the INCLVLT1 member we listed the outcode “VLT1” that identifies the tape files to be selected;

```
    File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help

--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(INCLVLT1) - 01.00                 Columns 00001 00080
Command ===>                                                        Scroll ===> CSR
****** ******************************** Top of Data ********************************
==MSG> Enter inclusion outcode patterns.  DO NOT use “*” in column 1,
==MSG> except for comments.  See Users Guide for pattern syntax.
‘’’’’ VLT1
****** ****************************** Bottom of Data******************************
```

In the EXCLNVLT member, we listed the values that allow the selection of tapes that are not outcoded, so that the defaults that are listed in the TAPECOPY.PARMLIB(INCLOUTC) are negated;

```
   File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
 ------------------------------------------------------------------------------
-
 EDIT       OT.TAPECOPY.PARMLIB(EXCLNVLT) - 01.00                 Columns 00001 00080
 Command ===>                                                        Scroll ===> CSR
 ****** ******************************** Top of Data ***********************************
 ==MSG> Enter exclusion outcode patterns.  DO NOT use "*" in column 1,
 ==MSG> except for comments.  See Users Guide for pattern syntax.
 000001 <NULL> - ACCEPTS ANY OUT CODE THAT WAS SPACES (OR LESS) AND IT WILL
 000002 *        ACCEPT THE DATA CENTER LOCATION ID IF IT WAS PRESENT.
 000003 <#LIB> - FOR CA-1 USERS, ACCEPTS ( LIB) AS AN OUT CODE VALUE.
 000004 <#VMS> - FOR CA-1 USERS, ACCEPTS ( VMS) AS AN OUT CODE VALUE.
 ************************************** Bottom of Data ******************************
```

After the members have been updated we need to specify 'S' in the "Edit/Sel" column so that the listed PDS members are selected for processing;

```
 ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
 ---------------------------  Candidate Selection  --------------------------
 COMMAND ===>

 Stacked File Qualification:   FIRST
 (Process volume set if 1st file selected)

 Dataset Size:    Min ___0 B          Max _100 G      Select on: GDG DSNs: YES_
 Expiration Date: Min ________30      Max _____99999        Multi-Volume: YES_
 Create Date:     Min _________0      Max _____99999        Stacked Files: YES_
 Days Idle:       Min _________3      Max _____99999        Robotic Tapes: YES_
 Volser Range:  From: $_____          To: 999999            Virtual Tapes: NO__
 Media Type:   Input: ALL_____    Output: 3590____       Uncataloged DSNs: NO__
 Label Format: Input: ALL         Output: ASIS            Expiration Type: NO__
 Compression:  Input: ALL___      Output: COMP__           Volume Age/Use: NO__

 Edit  Pattern  Incl
 /Sel   Type   /Excl  Dataset (containing the patterns)
   S    OUTC     I    OT.TAPECOPY.PARMLIB(INCLVLT1)_____________________________
   S    OUTC     E    OT.TAPECOPY.PARMLIB(EXCLNVLT)_____________________________
   _    ____     _    ____________________________________________________________
   _    ____     _    ____________________________________________________________

 ENTER to continue, PF3 to exit.
```

After pressing ENTER on the Candidate Selection panel, the Candidate Job Parameters panel is displayed. This panel is used to specify processing options for the Candidate Selection Job. In this example we have set the “Save Candidate Job JCL to DSN” field to a pds(member) where we want the Candidate Selection Job JCL to be saved. We also set the “Pre-Filter: Scratches:” field to ENHANCED to allow Tape/Copy to reject records that are in Delete or Scratch status, which can significantly reduce the Candidate Selection processing time. This panel also allows for customization of the Job card for the Candidate Selection Job as well as options for controlling which reports are generated;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
--------------------------  Candidate Job Parameters  ----------------------
COMMAND ===>
Save Candidate Job JCL to DSN= OT02.JCL.CNTL(EXAMPLE1)______________________
Candidate Job Jobcard JCL:
       //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
       //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)___________________________
       //*CANDIDATE SELECTION JOB_____________________________________________
       //*____________________________________________________________________

Pre-filter:                           Reports:
 Scratches:         ENHANCED           Candidate Selection:         YES
 Tape Volser Range: NO_                Conversion Forecast:         YES
 Dataset Names:     NO_                Conversion Forecast Detail:  YES
 Dataset Name/Creation Job: NO_        Candidate Rejection:         YES
Generate:                             Candidate Rejection Summary: YES
 Candidate Tape Pre-Pull WTOR: NO_     Candidate Tape Pre-Pull:     YES
 Conversion JCL:               YES     Bad Media:                   YES
                                       Lost Volumes:                YES
                                       Conversion Statistics:       YES___
Candidate Job Restart DD Statement:
       ______________________________________________________________________

ENTER to continue to next panel, PF3 to return to previous panel
```

After pressing ENTER on the Candidate Job Parameters panel, the Conversion Job Parameters panel is displayed. This panel is used to specify the options that control the Conversion Jobs and which files will be put into which Conversion Jobs. For this example we set the “Auto Submit JCL” field to ‘YES’, this will cause the Conversion Jobs to be submitted to the internal reader as they are built. We also set the “Data Copy Function” to ‘MOVE’ so that the input files are expired after they are successfully copied to the output tapes. The “Output File Stacking” field has been set to ‘STACK’ to cause the input files to be stacked to as few output tapes as possible. Finally, we set the “Set STACK Options” field to ‘YES’ to force the Stacked Output Options pop-up panel to be displayed.

```
----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
--------------------------  Conversion Job Parameters  -----------------------
COMMAND ===>
Save Conversion JCL to DSN:  OT02.CONVJCL.CNTL____________________________
                 DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     YES
Input Tapes per job:        __200          Files per job:       _9999
MB Per Job:                 _____0
Data Copy Function:         MOVE           Set MOVE Options:    NO_

Output File Stacking:       STACK__        Set STACK Options:   YES
Output File Cataloging:     ASIS_______
Output File Reblocking:      NONE____   Edit: _
Output File Encryption:     ASIS____   Edit: _

Conversion Job Triggering:   NO_           Set TRIGR Options:   NO_
Use Advanced Recall Interface: NO_

Conversion Job Jobcard JCL:
      //OTTCCNV? JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,____________________
       //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M_______________
      //*CANDIDATE CONVERSION JOB_________________________________________________
       //*_________________________________________________________________________
Notify Userids:  _______ _______ _______ _______ _______ _______ _______

ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

After pressing ENTER on the Conversion Job Parameters panel, the Stacked Output Options pop-up panel is displayed. On this panel we have set the “Stack Control DSN Prefix” field to ‘OT.STACK.CONTROL’ to assure that the stacked tape is not expired until all files on that tape are eligible for expiration;

```
.-------------------------------------------------------------.
| ------------  OpenTech Tape/Copy System Rx.x.x  ----------- |
| -----------------  Stacked Output Options  ---------------- |
| COMMAND ===>                                                |
|                                                             |
|                                                             |
| Candidate Sort Field:     NONE_ None, Crtdt, Expdt,Cxpdt,DSN|
|                                                             |
| Stack Control DSN Prefix: OT.STACK.CONTROL_                 |
|                                                             |
| Output Tape Limit:        NONE                              |
|    Minimum Percent Used:  _0                                |
|    Percent Used Cutoff:   99                                |
|                                                             |
| Co-Location Table:        NONE____   Edit: _                |
|                                                             |
| ENTER to continue, PF3 to exit.                             |
'-------------------------------------------------------------'
```

After pressing ENTER on the Stacked Output Options pop-up panel, the Candidate Selection Job JCL is generated and displayed. Type SUBMIT on the Command line and hit ENTER to run the job.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT02.JCL.CNTL(EXAMPLE1) - 01.01                        Columns 00001 00080
Command ===>                                                         Scroll ===> CSR
****** ****************************** Top of Data ***********************************
000001 //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),
000002 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
000003 //*CANDIDATE SELECTION JOB
000004 //*
000005 //*
000006 //S010    EXEC PGM=OTTCCAND
000007 //* ******************************************************************
000008 //* * TAPE/COPY MASS COPY SELECTION JOB STEP
000009 //* *  1. DUMP/SORT/SUMMARIZE MULTI-VOLUME TAPE DATASETS
000010 //* *  2. GENERATE FILE OF TAPE/COPY CANDIDATE DATASETS
000011 //* *  3. GENERATE TAPE/COPY TAPE CONVERSION JCL
000012 //* ******************************************************************
000013 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000014 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000015 //INCLOUTC DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB(INCLOUTC)
000016 //         DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB(INCLVLT1)
000017 //EXCLOUTC DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB(EXCLOUTC)
000018 //         DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB(EXCLNVLT)
000019 //PGMSETS  DD *
000020 AUTO-SUBMIT:                                    YES
000021 CNV-JOB-STACK-CNTL-FILE-PREFIX:                 OT.STACK.CONTROL
000022 DATA-COPY-FUNCTION:                             MOVE
000023 OUTPUT-FILE-FORMAT:                             STACK
000024 OUTPUT-MEDIA-TYPE:                              3590
000025 PRE-EDIT-REJECTIONS:                            ENHANCED
000026 //NOTIFIES DD *
000027 /*
000028 //JOBSTMTS DD DATA,DLM=@@
000029 //XXXXXXXX JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,
000030 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M
000031 //*CANDIDATE CONVERSION JOB
000032 //*
000033 //* ******************************************************************
000034 //* * TAPE/COPY TAPE DATASET CONVERSION JOB
000035 //* *   DATA CONVERSION ENGINE = UNDETERMINED
000036 //* *   JCL CREATED - DATE:  XX/XX/XXXX   TIME:  XX:XX:XX
000037 //* ******************************************************************
000038 //S010    EXEC PGM=OTTC0003
000039 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000040 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000041 @@
000042 //JCLSTMTS DD DATA,DLM=@@
000043 //PGMSETS  DD *
000044 CNV-JOB-STACK-CNTL-FILE-PREFIX:                 OT.STACK.CONTROL
000045 //NOTIFIES DD *
000046 /*
000047 //INFILE   DD *
000047 @@
```

Example 2

In this example we will demonstrate how to stack tape files in groups based on their calculated expiration date to tapes in an ATL called OTATL001. Begin by selecting option '1' from the Primary Selection Panel, to start the Mass Copy dialog;

```
   -------------------------  OpenTech Tape/Copy System  -----------------------
 --------------------------  Primary Selection Panel  --------------------------
   SELECTION ===> 1


     0  Parmlib          Modify Parameter Library
     1  Mass Copy        Multiple Tape Processing
     2  Copy on Demand   Fast Copy Single Datasets
     3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
     4  Audit Log Rpt    Generate Reports from the Audit Log File
     5  Tape Analysis    Perform analysis of tape file(s)
     6  Tape Compare     Compare tape files

     7  VDR Options      VDR Creation and Recovery Options









     PF3 to terminate Tape/Copy.
```

The first panel displayed by the Mass Copy dialog allows the user to specify the selection criteria, and the target media type. For this example we are copying the input files to tapes in the OTATL001 ATL, so we have specified OTATL001 in the "Media Type: Output:" field. For selection criteria we will take the default values;

```
  ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
  ---------------------------  Candidate Selection  --------------------------
  COMMAND ===>

  Stacked File Qualification:   FIRST
  (Process volume set if 1st file selected)

  Dataset Size:    Min ___0 B          Max _100 G      Select on: GDG DSNs: YES_
  Expiration Date: Min ________30      Max _____99999         Multi-Volume: YES_
  Create Date:     Min _________0      Max _____99999        Stacked Files: YES_
  Days Idle:       Min _________3      Max _____99999        Robotic Tapes: YES_
  Volser Range:  From: $_____          To: 999999            Virtual Tapes: NO__
  Media Type:   Input: ALL_____    Output: OTATL0001      Uncataloged DSNs: NO__
  Label Format: Input: ALL         Output: ASIS            Expiration Type: NO__
  Compression:  Input: ALL___      Output: COMP__           Volume Age/Use: NO__

  Edit  Pattern  Incl
  /Sel   Type   /Excl  Dataset (containing the patterns)
    _    ____     _    ____________________________________________________
    _    ____     _    ____________________________________________________
    _    ____     _    ____________________________________________________
    _    ____     _    ____________________________________________________

  ENTER to continue, PF3 to exit.
```

After pressing ENTER on the Candidate Selection panel, the Candidate Job Parameters panel is displayed. This panel is used to specify processing options for the Candidate Selection Job. In this example we have set the “Save Candidate Job JCL to DSN” field to a pds(member) where we want the Candidate Selection Job JCL to be saved. We also set the “Pre-Filter: Scratches:” field to ENHANCED to allow Tape/Copy to reject records that are in Delete or Scratch status, which can significantly reduce the Candidate Selection processing time. This panel also allows for customization of the Job card for the Candidate Selection Job as well as options for controlling which reports are generated;

```
  ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
  --------------------------  Candidate Job Parameters  -----------------------
  COMMAND ===>
  Save Candidate Job JCL to DSN= OT02.JCL.CNTL(EXAMPLE2)______________________
  Candidate Job Jobcard JCL:
         //OTTCCAND JOB
(ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
         //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)__________________________
         //*CANDIDATE SELECTION
JOB_______________________________________________
         //*_____________________________________________________________________

  Pre-filter:                           Reports:
   Scratches:         ENHANCED           Candidate Selection:         YES
   Tape Volser Range: NO_                Conversion Forecast:         YES
   Dataset Names:     NO_                Conversion Forecast Detail:  YES
   Dataset Name/Creation Job: NO_        Candidate Rejection:         YES
  Generate:                             Candidate Rejection Summary: YES
   Candidate Tape Pre-Pull WTOR: NO_     Candidate Tape Pre-Pull:     YES
   Conversion JCL:               YES     Bad Media:                   YES
                                         Lost Volumes:                YES
                                         Conversion Statistics:       YES___
  Candidate Job Restart DD Statement:


_____________________________________________________________________

  ENTER to continue to next panel, PF3 to return to previous panel
```

After pressing ENTER on the Candidate Job Parameters panel, the Conversion Job Parameters panel is displayed. This panel is used to specify the options that control the Conversion Jobs and which files will be put into which Conversion Jobs. For this example we set the “Data Copy Function” to ‘MOVE’ so that the input files are expired after they are successfully copied to the output tapes. The “Output File Stacking” field has been set to ‘STACK’ to cause the input files to be stacked to as few output tapes as possible. We also set the “Set STACK Options” field to ‘YES’ to force the Stacked Output Options pop-up panel to be displayed.

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
-------------------------  Conversion Job Parameters  -----------------------
COMMAND ===>
Save Conversion JCL to DSN:  OT02.CONVJCL.CNTL____________________________
                  DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
Input Tapes per job:         __200          Files per job:       _9999
MB Per Job:                  _____0
Data Copy Function:          MOVE           Set MOVE Options:    NO_

Output File Stacking:        STACK__        Set STACK Options:   YES
Output File Cataloging:      ASIS_______
Output File Reblocking:      NONE____  Edit: _
Output File Encryption:      ASIS____  Edit: _

Conversion Job Triggering:   NO_            Set TRIGR Options:   NO_
Use Advanced Recall Interface: NO_

Conversion Job Jobcard JCL:
       //OTTCCNV? JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,____________________
        //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M_______________
       //*CANDIDATE CONVERSION JOB_________________________________________________
        //*_________________________________________________________________________
Notify Userids:  _______ _______ _______ _______ _______ _______ _______

ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

After pressing ENTER on the Conversion Job Parameters panel, the Stacked Output Options pop-up panel is displayed. On this panel we have set the “Stack Control DSN Prefix” field to ‘OT.STACK.CONTROL’ to assure that the stacked tape is not expired until all files on that tape are eligible. We also set the “Co-Location Table” field to COLOCEX2, which will be the member (of the Tape/Copy PARMLIB) used for the co-location rules, and set the “Edit” field to ‘Y’ to allow us to update the rules within the Tape/Copy dialog;

```
.-------------------------------------------------------------.
| ------------  OpenTech Tape/Copy System Rx.x.x  ----------- |
| -----------------  Stacked Output Options  ---------------- |
| COMMAND ===>                                                |
|                                                             |
|                                                             |
| Candidate Sort Field:     NONE_ None, Crtdt, Expdt,Cxpdt,DSN|
|                                                             |
| Stack Control DSN Prefix: OT.STACK.CONTROL_                 |
|                                                             |
| Output Tape Limit:        NONE                              |
|    Minimum Percent Used:  _0                                |
|    Percent Used Cutoff:   99                                |
|                                                             |
| Co-Location Table:        COLOCEX2   Edit: Y                |
|                                                             |
|                                                             |
| ENTER to continue, PF3 to exit.                             |
.-------------------------------------------------------------.
```

In the COLOCEX2 member, we have made the following co-location rules. Comments were added to the top for the example, but are not required. These rules will cause all the files with a calculated expiration date (keyword=CEXPDT) that is less than or equal to today + 15 days to be grouped together into one job group, when the CEXPDT is between 16 and 30 days from today the files will be placed in a second job group, etc.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT.TAPECOPY.PARMLIB(COLOCEX2) - 01.00                  Columns 00001 00080
Command ===>                                                        Scroll ===> CSR
****** ****************************** Top of Data ***********************************
000001 *      COMPARE    COMPARE COMMENTS
000002 *RULE   FIELD  OP  DATA
000003 *----+ +-----+ -- +-----+ +-----------------------
000004 IF   CEXPDT  LE 15    Co-Loc group for calc expdt <= 15 days

000005 IF   CEXPDT  LE 30            for > 15 days and <= 30 days

000006 IF   CEXPDT  LE 60           for > 30 days and <= 60 days

000007 IF   CEXPDT  LE 90           for > 60 days and <= 90 days

000008 IF   CEXPDT  LE 180          for > 90 days and <= 180 days

000009 IF   CEXPDT  LE 270          for > 180 days and <= 270 days

000010 IF   CEXPDT  LE 365          for > 270 days and <= 365 days

000011 IF   CEXPDT  LE 730          for > 365 days and <= 730 days

000012 IF   CEXPDT  LE 99999        for > 730 days and <= 99999 days

****** ****************************** Bottom of Data ********************************
```

After pressing ENTER on the Conversion Job Parameters panel, the Candidate Selection Job JCL is generated and displayed. Type SUBMIT on the Command line and hit ENTER to run the job.

```
 File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT02.JCL.CNTL(EXAMPLE2) - 01.01                         Columns 00001 00080
Command ===>                                                          Scroll ===> CSR
****** ****************************** Top of Data ***********************************
000001 //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),
000002 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
000003 //*CANDIDATE SELECTION JOB
000004 //*
000005 //*
000006 //S010    EXEC PGM=OTTCCAND
000007 //* ******************************************************************
000008 //* * TAPE/COPY MASS COPY SELECTION JOB STEP
000009 //* *  1. DUMP/SORT/SUMMARIZE MULTI-VOLUME TAPE DATASETS
000010 //* *  2. GENERATE FILE OF TAPE/COPY CANDIDATE DATASETS
000011 //* *  3. GENERATE TAPE/COPY TAPE CONVERSION JCL
000012 //* ******************************************************************
000013 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000014 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000015 //PGMSETS  DD *
000016 ACTIVE-CO-LOCATION-TABLE:                        COLOCEX2
000017 AUTO-SUBMIT:                                     YES
000018 CNV-JOB-STACK-CNTL-FILE-PREFIX:                  OT.STACK.CONTROL
000019 DATA-COPY-FUNCTION:                              MOVE
000020 OUTPUT-FILE-FORMAT:                              STACK
000021 OUTPUT-MEDIA-TYPE:                               OTVTL001
000022 PRE-EDIT-REJECTIONS:                             ENHANCED
000023 //NOTIFIES DD *
000024 /*
000025 //JOBSTMTS DD DATA,DLM=@@
000026 //XXXXXXXX JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,
000027 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M
000028 //*CANDIDATE CONVERSION JOB
000029 //*
000030 //* ******************************************************************
000031 //* * TAPE/COPY TAPE DATASET CONVERSION JOB
000032 //* *   DATA CONVERSION ENGINE = UNDETERMINED
000033 //* *   JCL CREATED - DATE:  XX/XX/XXXX   TIME:  XX:XX:XX
000034 //* ******************************************************************
000035 //S010    EXEC PGM=OTTC0003
000036 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000037 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000038 @@
000039 //JCLSTMTS DD DATA,DLM=@@
000040 //PGMSETS  DD *
000041 CNV-JOB-STACK-CNTL-FILE-PREFIX:                  OT.STACK.CONTROL
000042 //NOTIFIES DD *
000043 /*
000044 //INFILE   DD *
000045 @@
****** ***************************** Bottom of Data ********************************
```

When the candidate selection job runs a Co-Location Table Report will be generated that relates each co-location rule with a co-location id;

```
REL x.x.x  PTF x                                T A P E / C O P Y                                          PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     CO-LOCATION TABLE REPORT FOR OPENTECH_SYSTEMS,_INC.                          PAGE      1

 CO-LOCATION        TMS
 +---ID----+      +FIELD+    +-----------------COMPARE DATA-----------------+

           1  IF  CEXPDT  LE 2003.081

           2  IF  CEXPDT  LE 2003.096

           3  IF  CEXPDT  LE 2003.126

           4  IF  CEXPDT  LE 2003.156

           5  IF  CEXPDT  LE 2003.246

           6  IF  CEXPDT  LE 2003.336

           7  IF  CEXPDT  LE 2004.066

           8  IF  CEXPDT  LE 2005.066

           9  IF  CEXPDT  LE 2277.054
```

The co-location id is used to relate the datasets selected by each rule with the Conversion Jobs generated on the Forecast report;

```
REL x.x.x  PTF x                                     T A P E / C O P Y                                      PROGRAM OTTCCAND

DATE:  xx/xx/xxxx   TIME:  xx:xx:xx     TAPE CONVERSION FORECAST REPORT FOR OPENTECH_SYSTEMS,_INC.                    PAGE      1

                                            +---------INPUT MEDIA STATISTICS---------+ +----------OUTPUT MEDIA FORECAST---------+
+---CONVERSION--+ +--FILE +-DATA USED +CO-LOC+ +MEDIA-+ +TAPES TAPE VOLUME +USAGE +-2NDRY +MEDIA-+ +TAPES TAPE VOLUME +USAGE +-
2NDRY
JOB NAME   MEMBER   COUNT CAPACITY-GB    ID      TYPE     USED CAPACITY-GB    %     FILES   TYPE   NEEDED CAPACITY-GB    %     FILES
OT010000 JOB00001      45       0.063        0 VTAPE        6       6.000    1.1      39 OTVTL001      1       1.000    6.3      44
OT010001 JOB00002       2       0.004        5 VTAPE        4       4.000    0.1       0 OTVTL001      1       1.000    0.4       1
OT010002 JOB00003       3       0.218        7 VTAPE        5       5.000    4.4       0 OTVTL001      1       1.000   21.8       2
OT010003 JOB00004      53       0.065        8 VTAPE       18      18.000    0.4      45 OTVTL001      1       1.000    6.5      52
OT010004 JOB00005      53       0.111        9 VTAPE       19      19.000    0.6      48 OTVTL001      1       1.000   11.1      52

TOTAL                 156       0.461                      52      52.000    0.9     132              5       5.000    9.2     151
      SECONDARY FILE RECORDS NEEDED:          151
```

In this example, there were 45 files that did not match any of the rules (co-location id=0), 2 files matched co-location id=5 (calculated expiration date less than or equal to 2003.246), etc. The co-location id is also listed on the Forecast Detail Report (DDName=FCASTDTL) to allow reviewing which files were assigned to which co-location id.

Example 3

In this example we will demonstrate how to unstack multi-file multi-volume tape files to tapes in a virtual tape library called OTVTL001. Begin by selecting option ‘1’ from the Primary Selection Panel, to start the Mass Copy dialog;

```
-------------------------  OpenTech Tape/Copy System  -----------------------
--------------------------  Primary Selection Panel  ------------------------
SELECTION ===> 1


  0  Parmlib          Modify Parameter Library
  1  Mass Copy        Multiple Tape Processing
  2  Copy on Demand   Fast Copy Single Datasets
  3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
  4  Audit Log Rpt    Generate Reports from the Audit Log File
  5  Tape Analysis    Perform analysis of tape file(s)
  6  Tape Compare     Compare tape files

  7  VDR Options      VDR Creation and Recovery Options









  PF3 to terminate Tape/Copy.
```

The first panel displayed by the Mass Copy dialog allows the user to specify the selection criteria, and the target media type. For this example we are unstacking the input files to tapes in the OTVTL001 virtual tape library, so we have specified OTVTL001 in the “Media Type: Output:” field. For selection criteria we have set the “Select on” “Multi-Volume” and “Stacked Files” fields to ‘ONLY’ to limit the selection to tape files that are multi-volume and multi-file;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Selection  --------------------------
COMMAND ===>

Stacked File Qualification:   FIRST
(Process volume set if 1st file selected)

Dataset Size:    Min ___0 B         Max _100 G      Select on: GDG DSNs: YES_
Expiration Date: Min ________30     Max _____99999        Multi-Volume: ONLY
Create Date:     Min _________0     Max _____99999       Stacked Files: ONLY
Days Idle:       Min _________3     Max _____99999       Robotic Tapes: YES_
Volser Range:  From: $_____         To: 999999           Virtual Tapes: NO__
Media Type:   Input: ALL_____    Output: OTVTL0001     Uncataloged DSNs: NO__
Label Format: Input: ALL         Output: ASIS           Expiration Type: NO__
Compression:  Input: ALL___      Output: COMP__          Volume Age/Use: NO__

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________

ENTER to continue, PF3 to exit.
```

After pressing ENTER on the Candidate Selection panel, the Candidate Job Parameters panel is displayed. This panel is used to specify processing options for the Candidate Selection Job. In this example we have set the “Save Candidate Job JCL to DSN” field to a pds(member) where we want the Candidate Selection Job JCL to be saved. We also set the “Pre-Filter: Scratches:” field to ENHANCED to allow Tape/Copy to reject records that are in Delete or Scratch status, which can significantly reduce the Candidate Selection processing time. This panel also allows for customization of the Job card for the Candidate Selection Job as well as options for controlling which reports are generated;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Job Parameters  -----------------------
COMMAND ===>
Save Candidate Job JCL to DSN= OT02.JCL.CNTL(EXAMPLE3)______________________
Candidate Job Jobcard JCL:
      //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
       //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)___________________________
      //*CANDIDATE SELECTION JOB_____________________________________________
       //*____________________________________________________________________

Pre-filter:                           Reports:
 Scratches:         ENHANCED           Candidate Selection:         YES
 Tape Volser Range: NO_                Conversion Forecast:         YES
 Dataset Names:     NO_                Conversion Forecast Detail:  YES
  Dataset Name/Creation Job: NO_       Candidate Rejection:         YES
Generate:                             Candidate Rejection Summary: YES
 Candidate Tape Pre-Pull WTOR: NO_     Candidate Tape Pre-Pull:     YES
 Conversion JCL:               YES     Bad Media:                   YES
                                       Lost Volumes:                YES
                                       Conversion Statistics:       YES___
Candidate Job Restart DD Statement:


_____________________________________________________________________

ENTER to continue to next panel, PF3 to return to previous panel
```

After pressing ENTER on the Candidate Job Parameters panel, the Conversion Job Parameters panel is displayed. This panel is used to specify the options that control the Conversion Jobs and which files will be put into which Conversion Jobs. For this example we set the “Data Copy Function” to ‘MOVE’ so that after the input files are expired after they are successfully copied to the output tapes. The “Output File Stacking” field has been set to ‘UNSTACK’ to cause the input files to be unstacked (copying each file to a separate output tape;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
-------------------------  Conversion Job Parameters  -----------------------
COMMAND ===>
Save Conversion JCL to DSN:  OT02.CONVJCL.CNTL____________________________
                  DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
Input Tapes per job:         __200          Files per job:       _9999
MB Per Job:                  _____0
Data Copy Function:          MOVE           Set MOVE Options:    NO_

Output File Stacking:        UNSTACK        Set STACK Options:   NO_
Output File Cataloging:      ASIS_______
Output File Reblocking:      NONE____  Edit: _
Output File Encryption:      ASIS____  Edit: _

Conversion Job Triggering:   NO_            Set TRIGR Options:   NO_
Use Advanced Recall Interface: NO_

Conversion Job Jobcard JCL:
       //OTTCCNV? JOB
(ACCT1,ACCT2),’PROG.NAME’,TYPRUN=HOLD,____________________
       //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M_______________
       //*CANDIDATE CONVERSION JOB_____________________________________________
       //*_____________________________________________________________________
Notify Userids:  _______ _______ _______ _______ _______ _______ _______

ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

After pressing ENTER on the Conversion Job Parameters panel, the Candidate Selection job is generated and displayed. Type “SUBMIT” on the Command line and hit ENTER to run the job.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT02.JCL.CNTL(EXAMPLE3) - 01.01                        Columns 00001 00080
Command ===>                                                          Scroll ===> CSR
****** ********************************* Top of Data **********************************
000001 //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),
000002 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
000003 //*CANDIDATE SELECTION JOB
000004 //*
000005 //*
000006 //S010    EXEC PGM=OTTCCAND
000007 //* ******************************************************************
000008 //* * TAPE/COPY MASS COPY SELECTION JOB STEP
000009 //* *  1. DUMP/SORT/SUMMARIZE MULTI-VOLUME TAPE DATASETS
000010 //* *  2. GENERATE FILE OF TAPE/COPY CANDIDATE DATASETS
000011 //* *  3. GENERATE TAPE/COPY TAPE CONVERSION JCL
000012 //* ******************************************************************
000013 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000014 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000015 //PGMSETS  DD *
000016 DATA-COPY-FUNCTION:                              MOVE
000017 OUTPUT-FILE-FORMAT:                              UNSTACK
000018 OUTPUT-MEDIA-TYPE:                               OTVTL001
000019 PRE-EDIT-REJECTIONS:                             ENHANCED
000020 PROCESS-MULTI-VOLUME-DATASETS:                   ONLY
000021 PROCESS-STACKED-FILES:                           ONLY
000022 //NOTIFIES DD *
000023 /*
000024 //JOBSTMTS DD DATA,DLM=@@
000025 //XXXXXXXX JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,
000026 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M
000027 //*CANDIDATE CONVERSION JOB
000028 //*
000029 //* ******************************************************************
000030 //* * TAPE/COPY TAPE DATASET CONVERSION JOB
000031 //* *   DATA CONVERSION ENGINE = UNDETERMINED
000032 //* *   JCL CREATED - DATE:  XX/XX/XXXX   TIME:  XX:XX:XX
000033 //* ******************************************************************
000034 //S010    EXEC PGM=OTTC0003
000035 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000036 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000037 @@
000038 //JCLSTMTS DD DATA,DLM=@@
000039 //PGMSETS  DD *
000040 //NOTIFIES DD *
000041 /*
000042 //INFILE   DD *
000043 @@
****** ******************************** Bottom of Data ********************************
```

Example 4

In this example we will demonstrate how to stack tape files that have not been used for 120 days to tapes in an ATL called OTATL001. Begin by selecting option ‘1’ from the Primary Selection Panel, to start the Mass Copy dialog;

```
------------------------  OpenTech Tape/Copy System  ------------------------
-------------------------  Primary Selection Panel  -------------------------
SELECTION ===> 1


  0  Parmlib          Modify Paramea Library
  1  Mass Copy        Multiple Tape Processing
  2  Copy on Demand   Fast Copy Single Datasets
  3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
  4  Audit Log Rpt    Generate Reports from the Audit Log File
  5  Tape Analysis    Perform analysis of tape file(s)
  6  Tape Compare     Compare tape files

  7  VDR Options      VDR Creation and Recovery Options









  PF3 to terminate Tape/Copy.
```

The first panel displayed by the Mass Copy dialog allows the user to specify the selection criteria, and the target media type. For this example we are stacking the input files to tapes in the ATL named OTATL001, so we have specified OTATL001 in the “Media Type: Output:” field. For selection criteria we have set the “Min Days Idle” field to ‘120’ to limit the selection to tape files that have been idle (not used) for 120 days;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Selection  --------------------------
COMMAND ===>

Stacked File Qualification:   FIRST
(Process volume set if 1st file selected)

Dataset Size:    Min ___0 B          Max _100 G      Select on: GDG DSNs: YES_
Expiration Date: Min ________30      Max _____99999         Multi-Volume: YES_
Create Date:     Min _________0      Max _____99999        Stacked Files: YES_
Days Idle:       Min _______120      Max _____99999        Robotic Tapes: YES_
Volser Range:  From: $_____          To: 999999            Virtual Tapes: NO__
Media Type:   Input: ALL_____    Output: OTATL0001      Uncataloged DSNs: NO__
Label Format: Input: ALL         Output: ASIS            Expiration Type: NO__
Compression:  Input: ALL___      Output: COMP__           Volume Age/Use: NO__

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________

ENTER to continue, PF3 to exit.
```

After pressing ENTER on the Candidate Selection panel, the Candidate Job Parameters panel is displayed. This panel is used to specify processing options for the Candidate Selection Job. In this example we have set the “Save Candidate Job JCL to DSN” field to a pds(member) where we want the Candidate Selection Job JCL to be saved. We also set the “Pre-Filter: Scratches:” field to ENHANCED to allow Tape/Copy to reject records that are in Delete or Scratch status, which can significantly reduce the Candidate Selection processing time. This panel also allows for customization of the Job card for the Candidate Selection Job as well as options for controlling which reports are generated;

```
----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Job Parameters  -----------------------
COMMAND ===>
Save Candidate Job JCL to DSN= OT02.JCL.CNTL(EXAMPLE4)______________________
Candidate Job Jobcard JCL:
       //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
        //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)___________________________
       //*CANDIDATE SELECTION JOB_____________________________________________
        //*____________________________________________________________________

Pre-filter:                            Reports:
 Scratches:         ENHANCED           Candidate Selection:         YES
 Tape Volser Range: NO_                Conversion Forecast:         YES
 Dataset Names:     NO_                Conversion Forecast Detail:  YES
 Dataset Name/Creation Job: NO_        Candidate Rejection:         YES
Generate:                             Candidate Rejection Summary: YES
 Candidate Tape Pre-Pull WTOR: NO_     Candidate Tape Pre-Pull:     YES
 Conversion JCL:               YES     Bad Media:                   YES
                                       Lost Volumes:                YES
                                       Conversion Statistics:       YES___
Candidate Job Restart DD Statement:
       ____________________________________________________________________

ENTER to continue to next panel, PF3 to return to previous panel
```

After pressing ENTER on the Candidate Job Parameters panel, the Conversion Job Parameters panel is displayed. This panel is used to specify the options that control the Conversion Jobs and which files will be put into which Conversion Jobs. For this example we set the “Data Copy Function” to ‘MOVE’ so that the input files are expired after they are successfully copied to the output tapes. The “Output File Stacking” field has been set to ‘STACK’ to cause the input files to be stacked to as few output tapes as possible. Finally, we set the “Set STACK Options” field to ‘YES’ to force the Stacked Output Options pop-up panel to be displayed.

```
  ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
  -------------------------  Conversion Job Parameters  -----------------------
  COMMAND ===>
  Save Conversion JCL to DSN:  OT02.CONVJCL.CNTL___________________________
                   DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
  Input Tapes per job:         __200         Files per job:       _9999
  MB Per Job:                  _____0
  Data Copy Function:          MOVE          Set MOVE Options:    NO_

  Output File Stacking:        STACK__       Set STACK Options:   YES
  Output File Cataloging:      ASIS_______
  Output File Reblocking:      NONE____  Edit: _
  Output File Encryption:      ASIS____  Edit: _

  Conversion Job Triggering:   NO_           Set TRIGR Options:   NO_
  Use Advanced Recall Interface: NO_

  Conversion Job Jobcard JCL:
         //OTTCCNV? JOB
(ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,____________________
         //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M______________
         //*CANDIDATE CONVERSION
JOB_____________________________________________
         //*_____________________________________________________________________
  Notify Userids:  _______ _______ _______ _______ _______ _______ _______

  ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

After pressing ENTER on the Conversion Job Parameters panel, the Stacked Output Options pop-up panel is displayed. On this panel we have set the “Stack Control DSN Prefix” field to ‘OT.STACK.CONTROL’ to assure that the stacked tape is not expired until all files on that tape are eligible for expiration;

```
  .-------------------------------------------------------------.
  | ------------  OpenTech Tape/Copy System Rx.x.x  ----------- |
  | -----------------  Stacked Output Options  ---------------- |
  | COMMAND ===>                                                |
  |                                                             |
  |                                                             |
  | Candidate Sort Field:     NONE_ None, Crtdt, Expdt,Cxpdt,DSN|
  |                                                             |
  | Stack Control DSN Prefix: OT.STACK.CONTROL_                 |
  |                                                             |
  | Output Tape Limit:        NONE                              |
  |    Minimum Percent Used:  _0                                |
  |    Percent Used Cutoff:   99                                |
  |                                                             |
  | Co-Location Table:        NONE____   Edit: _                |
  |                                                             |
  |                                                             |
  | ENTER to continue, PF3 to exit.                             |
  .-------------------------------------------------------------.
```

After pressing ENTER on the Stacked Output Options pop-up panel, the Candidate Selection Job JCL is generated and displayed. Type “SUBMIT” on the Command line and hit ENTER to run the job.

```
 File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT02.JCL.CNTL(EXAMPLE4) - 01.01                        Columns 00001 00080
Command ===>                                                          Scroll ===> CSR
****** ********************************* Top of Data **********************************
000001 //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),
000002 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
000003 //*CANDIDATE SELECTION JOB
000004 //*
000005 //*
000006 //S010    EXEC PGM=OTTCCAND
000007 //* ******************************************************************
000008 //* * TAPE/COPY MASS COPY SELECTION JOB STEP
000009 //* *  1. DUMP/SORT/SUMMARIZE MULTI-VOLUME TAPE DATASETS
000010 //* *  2. GENERATE FILE OF TAPE/COPY CANDIDATE DATASETS
000011 //* *  3. GENERATE TAPE/COPY TAPE CONVERSION JCL
000012 //* ******************************************************************
000013 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000014 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000015 //PGMSETS  DD *
000016 CNV-JOB-STACK-CNTL-FILE-PREFIX:                  OT.STACK.CONTROL
000017 DATA-COPY-FUNCTION:                              MOVE
000018 DAYS-IDLE:                                       120
000019 OUTPUT-FILE-FORMAT:                              STACK
000020 OUTPUT-MEDIA-TYPE:                               OTATL001
000021 PRE-EDIT-REJECTIONS:                             ENHANCED
000022 //NOTIFIES DD *
000023 /*
000024 //JOBSTMTS DD DATA,DLM=@@
000025 //XXXXXXXX JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,
000026 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M
000027 //*CANDIDATE CONVERSION JOB
000028 //*
000029 //* ******************************************************************
000030 //* * TAPE/COPY TAPE DATASET CONVERSION JOB
000031 //* *   DATA CONVERSION ENGINE = UNDETERMINED
000032 //* *   JCL CREATED - DATE:  XX/XX/XXXX   TIME:  XX:XX:XX
000033 //* ******************************************************************
000034 //S010    EXEC PGM=OTTC0003
000035 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000036 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000037 @@
000038 //JCLSTMTS DD DATA,DLM=@@
000039 //PGMSETS  DD *
000040 CNV-JOB-STACK-CNTL-FILE-PREFIX:                  OT.STACK.CONTROL
000041 //NOTIFIES DD *
000042 /*
000043 //INFILE   DD *
000044 @@
****** ******************************** Bottom of Data ********************************
```

Example 5

In this example we will demonstrate how to migrate tape files that are on tape media that is older than 5 years to new tape media of the same type. Begin by selecting option '1' from the Primary Selection Panel, to start the Mass Copy dialog;

```
-------------------------  OpenTech Tape/Copy System  -----------------------
--------------------------  Primary Selection Panel  ------------------------
SELECTION ===> 1


  0  Parmlib          Modify Parameter Library
  1  Mass Copy        Multiple Tape Processing
  2  Copy on Demand   Fast Copy Single Datasets
  3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
  4  Audit Log Rpt    Generate Reports from the Audit Log File
  5  Tape Analysis    Perform analysis of tape file(s)
  6  Tape Compare     Compare tape files

  7  VDR Options      VDR Creation and Recovery Options









  PF3 to terminate Tape/Copy.
```

The first panel displayed by the Mass Copy dialog allows the user to specify the selection criteria, and the target media type. For this example we are selecting tape files that reside on tape media that is more than 5 years old, so we have specified 'YES' in the "Volume Age/Use" field, which will cause the Volume Age/Usage Selection pop-up panel to be displayed. We have also set the "Output Media Type" field to 'ASIS' so that the new tape media will be selected based on the media type of the input tape files;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Selection  --------------------------
COMMAND ===>

Stacked File Qualification:   FIRST
(Process volume set if 1st file selected)

Dataset Size:    Min ___0 B          Max _100 G      Select on: GDG DSNs: YES_
Expiration Date: Min ________30      Max _____99999         Multi-Volume: YES_
Create Date:     Min _________0      Max _____99999        Stacked Files: YES_
Days Idle:       Min _________3      Max _____99999        Robotic Tapes: YES_
Volser Range:  From: $_____          To: 999999            Virtual Tapes: NO__
Media Type:   Input: ALL_____    Output: ASIS____       Uncataloged DSNs: NO__
Label Format: Input: ALL         Output: ASIS            Expiration Type: NO__
Compression:  Input: ALL___      Output: COMP__           Volume Age/Use: YES_

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________
  _    ____     _    ____________________________________________________

ENTER to continue, PF3 to exit.
```

After pressing ENTER on the Candidate Selection panel, the Volume Age/Usage Selection pop-up panel is displayed. On this panel we have set the "Minimum Days Since Volume Birth Date" field to '1826' (1826 days H" 5 years). This will limit the selected tape files to those that are on media that is older that 1826 days;

```
.-------------------------------------------------------------.
| ------------  OpenTech Tape/Copy System Rx.x.x  ----------- |
| ---------------  Volume Age/Usage Selection  -------------- |
| COMMAND ===>                                                |
|                                                             |
| Minimum Days Since Volume Birth Date:  ______1826           |
|                                                             |
| Minimum Temporary I/O Errors:          _____0               |
|                                                             |
| Minimum Volume Use Count:              _____0               |
|                                                             |
|                                                             |
| ENTER to continue, PF3 to exit.                             |
|                                                             |
.-------------------------------------------------------------.
```

After pressing ENTER on the Volume Age/Usage Selection pop-up panel, the Candidate Job Parameters panel is displayed. This panel is used to specify processing options for the Candidate Selection Job. In this example we have set the “Save Candidate Job JCL to DSN” field to a pds(member) where we want the Candidate Selection Job JCL to be saved. We also set the “Pre-Filter: Scratches:” field to ENHANCED to allow Tape/Copy to reject records that are in Delete or Scratch status, which can significantly reduce the Candidate Selection processing time. This panel also allows for customization of the Job card for the Candidate Selection Job as well as options for controlling which reports are generated;

```
  ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
  --------------------------  Candidate Job Parameters  ----------------------
  COMMAND ===>
  Save Candidate Job JCL to DSN= OT02.JCL.CNTL(EXAMPLE5)_____________________
  Candidate Job Jobcard JCL:
         //OTTCCAND JOB
(ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
         //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)_________________________
         //*CANDIDATE SELECTION
JOB_______________________________________________
         //*_____________________________________________________________________

  Pre-filter:                          Reports:
   Scratches:         ENHANCED          Candidate Selection:         YES
   Tape Volser Range: NO_               Conversion Forecast:         YES
   Dataset Names:     NO_               Conversion Forecast Detail:  YES
   Dataset Name/Creation Job: NO_       Candidate Rejection:         YES
  Generate:                            Candidate Rejection Summary: YES
   Candidate Tape Pre-Pull WTOR: NO_    Candidate Tape Pre-Pull:     YES
   Conversion JCL:               YES    Bad Media:                   YES
                                        Lost Volumes:                YES
                                        Conversion Statistics:       YES___
  Candidate Job Restart DD Statement:
         ____________________________________________________________________

  ENTER to continue to next panel, PF3 to return to previous panel
```

After pressing ENTER on the Candidate Job Parameters panel, the Conversion Job Parameters panel is displayed. This panel is used to specify the options that control the Conversion Jobs and which files will be put into which Conversion Jobs. For this example we set the “Data Copy Function” to ‘MOVE’ so that the input files are expired after they are successfully copied to the output tapes. The “Output File Stacking” field has been set to ‘ASIS’ to cause the input files to be copied to the output tapes with the same stacking that they currently have;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
-------------------------  Conversion Job Parameters  -----------------------
COMMAND ===>
Save Conversion JCL to DSN:  OT02.CONVJCL.CNTL___________________________
                  DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
Input Tapes per job:         __200          Files per job:       _9999
MB Per Job:                  _____0
Data Copy Function:          MOVE           Set MOVE Options:    NO_

Output File Stacking:        ASIS___        Set STACK Options:   NO_
Output File Cataloging:      ASIS_______
Output File Reblocking:      NONE____  Edit: _
Output File Encryption:      ASIS____  Edit: _

Conversion Job Triggering:   NO_            Set TRIGR Options:   NO_
Use Advanced Recall Interface: NO_

Conversion Job Jobcard JCL:
       //OTTCCNV? JOB
(ACCT1,ACCT2),’PROG.NAME’,TYPRUN=HOLD,___________________
       //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M_______________
       //*CANDIDATE CONVERSION JOB_____________________________________________
       //*_____________________________________________________________________
Notify Userids:  _______ _______ _______ _______ _______ _______ _______

ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

After pressing ENTER on the Conversion Job Parameters panel, the Candidate Selection Job JCL is generated and displayed. Type “SUBMIT” on the Command line and hit ENTER to run the job.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
--------------------------------------------------------------------------------
EDIT       OT02.JCL.CNTL(EXAMPLE5) - 01.01                        Columns 00001 00080
Command ===>                                                          Scroll ===> CSR
****** ********************************* Top of Data ********************************
000001 //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),
000002 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
000003 //*CANDIDATE SELECTION JOB
000004 //*
000005 //*
000006 //S010    EXEC PGM=OTTCCAND
000007 //* ******************************************************************
000008 //* * TAPE/COPY MASS COPY SELECTION JOB STEP
000009 //* *  1. DUMP/SORT/SUMMARIZE MULTI-VOLUME TAPE DATASETS
000010 //* *  2. GENERATE FILE OF TAPE/COPY CANDIDATE DATASETS
000011 //* *  3. GENERATE TAPE/COPY TAPE CONVERSION JCL
000012 //* ******************************************************************
000013 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000014 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000015 //PGMSETS  DD *
000016 DATA-COPY-FUNCTION:                              MOVE
000017 MINIMUM-DAYS-SINCE-VOLUME-BIRTH:                 1826
000018 OUTPUT-MEDIA-TYPE:                               ASIS
000019 PRE-EDIT-REJECTIONS:                             ENHANCED
000020 //NOTIFIES DD *
000021 /*
000022 //JOBSTMTS DD DATA,DLM=@@
000023 //XXXXXXXX JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,
000024 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M
000025 //*CANDIDATE CONVERSION JOB
000026 //*
000027 //* ******************************************************************
000028 //* * TAPE/COPY TAPE DATASET CONVERSION JOB
000029 //* *   DATA CONVERSION ENGINE = UNDETERMINED
000030 //* *   JCL CREATED - DATE:  XX/XX/XXXX   TIME:  XX:XX:XX
000031 //* ******************************************************************
000032 //S010    EXEC PGM=OTTC0003
000033 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000034 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000035 @@
000036 //JCLSTMTS DD DATA,DLM=@@
000037 //PGMSETS  DD *
000038 //NOTIFIES DD *
000039 /*
000040 //INFILE   DD *
000041 @@
****** ******************************** Bottom of Data ********************************
```

Example 6

In this example we will demonstrate how to “recycle” or re-stack stacked tape files that are not utilizing their current media to user defined specifications while assuring that the new output tapes do meet those criteria. Begin by selecting option ‘1’ from the Primary Selection Panel, to start the Mass Copy dialog;

```
-------------------------  OpenTech Tape/Copy System  -----------------------
--------------------------  Primary Selection Panel  ------------------------
SELECTION ===> 1


  0  Parmlib          Modify Parameter Library
  1  Mass Copy        Multiple Tape Processing
  2  Copy on Demand   Fast Copy Single Datasets
  3  ACS Copy         Multiple Tape Processing via SMS Tape ACS Routines
  4  Audit Log Rpt    Generate Reports from the Audit Log File
  5  Tape Analysis    Perform analysis of tape file(s)
  6  Tape Compare     Compare tape files

  7  VDR Options      VDR Creation and Recovery Options





 PF3 to terminate Tape/Copy.
```

The first panel displayed by the Mass Copy dialog allows the user to specify the selection criteria, and the target media type. For this example we have set the “Stacked File Qualification” field to ‘EACH’ so that only the files that meet the selection criteria will be copied. This allows the files that have expired to be excluded from the copy operation while copying the other files that have not yet expired. We specified “Select on Stacked Files” to ‘ONLY’ so that single file volume sets are automatically excluded. To limit the selection to files that are on under utilized tapes we have changed the “Dataset Size” field to “Volset Size” and specified 0% as the minimum and 50% as the maximum volume set utilization. We also changed the “Min Expiration Date” and “Min Days Idle” fields to ‘0’ and the “Select on Uncataloged DSNS” field to ‘YES’ so that only files with an expiration date that has past will be excluded. Finally, we have set the “Output Media Type” field to ‘ASIS’ so that the new tape media will be selected based on the media type of the input tape files;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
---------------------------  Candidate Selection  --------------------------
COMMAND ===>

Stacked File Qualification:   EACH_
(Process each file individually)

Volset  Size:    Min ___0 %          Max __50 %      Select on: GDG DSNs: YES_
Expiration Date: Min _________0      Max _____99999         Multi-Volume: YES_
Create Date:     Min _________0      Max _____99999        Stacked Files: ONLY
Days Idle:       Min _________0      Max _____99999        Robotic Tapes: YES_
Volser Range:  From: $_____          To: 999999            Virtual Tapes: NO__
Media Type:   Input: ALL_____    Output: ASIS____       Uncataloged DSNs: YES_
Label Format: Input: ALL         Output: ASIS            Expiration Type: NO__
Compression:  Input: ALL___      Output: COMP__           Volume Age/Use: NO__

Edit  Pattern  Incl
/Sel   Type   /Excl  Dataset (containing the patterns)
  _    ____     _    ____________________________________________________________
  _    ____     _    ____________________________________________________________
  _    ____     _    ____________________________________________________________
  _    ____     _    ____________________________________________________________

ENTER to continue, PF3 to exit.
```

After pressing ENTER on the Candidate Selection panel, the Candidate Job Parameters panel is displayed. This panel is used to specify processing options for the Candidate Selection Job. In this example we have set the “Save Candidate Job JCL to DSN” field to a pds(member) where we want the Candidate Selection Job JCL to be saved. We also set the “Pre-Filter: Scratches:” field to ENHANCED to allow Tape/Copy to reject records that are in Delete or Scratch status, which can significantly reduce the Candidate Selection processing time. This panel also allows for customization of the Job card for the Candidate Selection Job as well as options for controlling which reports are generated;

```
---------------------  OpenTech Tape/Copy System Rx.x.x  -------------------
--------------------------  Candidate Job Parameters  ----------------------
COMMAND ===>
Save Candidate Job JCL to DSN= OT02.JCL.CNTL(EXAMPLE6)______________________
Candidate Job Jobcard JCL:
        //OTTCCAND JOB
(ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),________
        //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)__________________________
        //*CANDIDATE SELECTION
JOB_______________________________________________
        //*_____________________________________________________________________

Pre-filter:                          Reports:
 Scratches:         ENHANCED          Candidate Selection:         YES
 Tape Volser Range: NO_               Conversion Forecast:         YES
 Dataset Names:     NO_               Conversion Forecast Detail:  YES
 Dataset Name/Creation Job: NO_       Candidate Rejection:         YES
Generate:                            Candidate Rejection Summary: YES
 Candidate Tape Pre-Pull WTOR: NO_    Candidate Tape Pre-Pull:     YES
 Conversion JCL:               YES    Bad Media:                   YES
                                      Lost Volumes:                YES
                                      Conversion Statistics:       YES___
Candidate Job Restart DD Statement:
        ____________________________________________________________________

ENTER to continue to next panel, PF3 to return to previous panel
```

After pressing ENTER on the Candidate Job Parameters panel, the Conversion Job Parameters panel is displayed. This panel is used to specify the options that control the Conversion Jobs and which files will be put into which Conversion Jobs. For this example we set the “Data Copy Function” to ‘MOVE’ so that the input volumes are expired after all of the selected files have been successfully copied to the output tapes. The “Output File Stacking” field has been set to ‘STACK’ to cause the input files to be stacked to as few output tapes as possible. Finally, we set the “Set STACK Options” field to ‘YES’ to force the Stacked Output Options pop-up panel to be displayed.

```
  ----------------------  OpenTech Tape/Copy System Rx.x.x  --------------------
  -------------------------  Conversion Job Parameters  -----------------------
  COMMAND ===>
  Save Conversion JCL to DSN:  OT02.CONVJCL.CNTL___________________________
                   DSN Type:  PDS (PDS/PS)   Auto Submit JCL:     NO_
  Input Tapes per job:         __200          Files per job:       _9999
  MB Per Job:                  _____0
  Data Copy Function:          MOVE           Set MOVE Options:    NO_

  Output File Stacking:        STACK__        Set STACK Options:   YES
  Output File Cataloging:      ASIS_______
  Output File Reblocking:      NONE____  Edit: _
  Output File Encryption:      ASIS____  Edit: _

  Conversion Job Triggering:   NO_            Set TRIGR Options:   NO_
  Use Advanced Recall Interface: NO_

  Conversion Job Jobcard JCL:
         //OTTCCNV? JOB
(ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,___________________
        //            CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M______________
        //*CANDIDATE CONVERSION JOB_____________________________________________
        //*_____________________________________________________________________
  Notify Userids:  _______ _______ _______ _______ _______ _______ _______

  ENTER to build candidate job, PF3 to return to Candidate Job Parameters
```

After pressing ENTER on the Conversion Job Parameters panel, the Stacked Output Options pop-up panel is displayed. On this panel we have set the “Stack Control DSN Prefix” field to ‘OT.STACK.CONTROL’ to assure that the new stacked tape is not expired until all files on that tape are eligible for expiration. We have also set the “Output Tape Limit” field to ‘1’ so that each job will only include enough data to fill a single tape. We have set the “Minimum Percent Used” parameter to ‘75’ so that any jobs that do not contain enough data to fill an output tape to 75% will not be built, preventing the creation of tapes that are still under utilized. Finally we have set the “Percent Used Cutoff” value to ‘95%’ to prevent files that do not meet the compression expectations from causing the output volume set from going to 2 tapes;

```
.-------------------------------------------------------------.
| ------------  OpenTech Tape/Copy System Rx.x.x  ----------- |
| -----------------  Stacked Output Options  ---------------- |
| COMMAND ===>                                                |
|                                                             |
|                                                             |
| Candidate Sort Field:     NONE_ None, Crtdt, Expdt,Cxpdt,DSN|
|                                                             |
| Stack Control DSN Prefix: OT.STACK.CONTROL_                 |
|                                                             |
| Output Tape Limit:        ___1                              |
|    Minimum Percent Used:  75                                |
|    Percent Used Cutoff:   95                                |
|                                                             |
| Co-Location Table:        NONE____   Edit: _                |
|                                                             |
|                                                             |
| ENTER to continue, PF3 to exit.                             |
.-------------------------------------------------------------.
```

After pressing ENTER on the Stacked Output Options pop-up panel, a Warning pop-up message is displayed. This message will be displayed any time that the “Stacked File Qualification” field has been set to ‘EACH’ and the “Data Copy Function” field has been set to ‘MOVE’, because these options can allow valid data on an input tape to be dropped during the copy process while expiring all files on the input tape. Special care should be taken when using these options, especially in reviewing the Candidate Selection and Rejection Reports to assure that all the valid files were selected and that no valid files were rejected.

```
.-------------------------------------------------------------.
| ********************************************************** |
| *                                                        * |
| *                       **WARNING**                      * |
| *                                                        * |
| * You have specified Stacked File Qualification = EACH   * |
| * with Data Copy Function = MOVE, together these         * |
| * options can result in Tape/Copy expiring active data   * |
| *                                                        * |
| * Please review the STACKED-FILE-QUALIFICATION parm      * |
| * documentation in the Parameter Reference Guide,        * |
| * before proceeding                                      * |
| *                                                        * |
| *                                                        * |
| * ENTER to Generate JCL   or    PF3 to Return             * |
| *                                                        * |
| ********************************************************** |
.-------------------------------------------------------------.
```

After pressing ENTER on the Warning pop-up message, the Candidate Selection Job JCL is generated and displayed. Type “SUBMIT” on the Command line and hit ENTER to run the job.

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
 ____________________________________
EDIT       OT02.JCL.CNTL(EXAMPLE6) - 01.01                        Columns 00001 00080
Command ===>                                                         Scroll ===> CSR
****** ********************************* Top of Data ********************************
000001 //OTTCCAND JOB (ACCT1,ACCT2),'PROG.NAME',REGION=4M,COND=(04,LT),
000002 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
000003 //*CANDIDATE SELECTION JOB
000004 //*
000005 //*
000006 //S010    EXEC PGM=OTTCCAND
000007 //* ******************************************************************
000008 //* * TAPE/COPY MASS COPY SELECTION JOB STEP
000009 //* *  1. DUMP/SORT/SUMMARIZE MULTI-VOLUME TAPE DATASETS
000010 //* *  2. GENERATE FILE OF TAPE/COPY CANDIDATE DATASETS
000011 //* *  3. GENERATE TAPE/COPY TAPE CONVERSION JCL
000012 //* ******************************************************************
000013 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000014 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000015 //PGMSETS  DD *
000016 CNV-JOB-STACK-CNTL-FILE-PREFIX:                  OT.STACK.CONTROL
000017 DATA-COPY-FUNCTION:                              MOVE
000018 DAYS-IDLE:                                       0
000019 MAXIMUM-DATASET-SIZE:                            50%
000020 MINIMUM-DATASET-SIZE:                            0%
000021 MINIMUM-DAYS-UNTIL-EXPIRATION:                   0
000022 OUTPUT-FILE-FORMAT:                              STACK
000023 OUTPUT-MEDIA-TYPE:                               ASIS
000024 PRE-EDIT-REJECTIONS:                             ENHANCED
000025 PROCESS-UNCATALOGED-DATASETS:                    YES
000026 STACKED-FILE-QUALIFICATION:                      EACH
000027 STACKED-OUTPUT-CUTOFF-UTILIZATION:               95
000028 STACKED-OUTPUT-MINIMUM-UTILIZATION:              75
000029 STACKED-OUTPUT-VOLUME-LIMIT:                     1
000030 USE-MIN/MAX-DATASET-SIZE-AS-VOLSET-SIZE:         YES
000031 //NOTIFIES DD *
000032 /*
000033 //JOBSTMTS DD DATA,DLM=@@
000034 //XXXXXXXX JOB (ACCT1,ACCT2),'PROG.NAME',TYPRUN=HOLD,
000035 //             CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),REGION=4M
000036 //*CANDIDATE CONVERSION JOB
000037 //*
000038 //* ******************************************************************
000039 //* * TAPE/COPY TAPE DATASET CONVERSION JOB
000040 //* *   DATA CONVERSION ENGINE = UNDETERMINED
000041 //* *   JCL CREATED - DATE:  XX/XX/XXXX   TIME:  XX:XX:XX
000042 //* ******************************************************************
000043 //S010    EXEC PGM=OTTC0003
000044 //STEPLIB  DD DISP=SHR,DSN=OT.TAPECOPY.LOADLIB
000045 //OTPRMLIB DD DISP=SHR,DSN=OT.TAPECOPY.PARMLIB
000046 @@
000047 //JCLSTMTS DD DATA,DLM=@@
000048 //PGMSETS  DD *
000049 CNV-JOB-STACK-CNTL-FILE-PREFIX:                  OT.STACK.CONTROL
000050 MINIMUM-DAYS-UNTIL-EXPIRATION:                   0
000051 //NOTIFIES DD *
000052 /*
000053 //INFILE   DD *
000054 @@
****** ******************************** Bottom of Data ********************************
```

Example 7

This example demonstrates the effects of the Stacked File Qualification setting on which files will be selected for processing. Assuming that INCLDSNS contains a single DSN pattern, USER.DATA1*, this table shows which files would be selected for processing or rejected for each setting of Stacked File Qualification;

				STACKED-FILE-QUALIFICATION			
Volser	**File Seq.**	**Dataset Name**	**Match Pattern**	**FIRST**	**ANY**	**ALL**	**EACH**
100100	1	USER.DATA1.TEST	Yes	Selected	Selected	Rejected	Selected
100100	2	USER.DATA2.TEST	No	Selected	Selected	Rejected	Rejected
100100	3	USER.DATA3.TEST	No	Selected	Selected	Rejected	Rejected

When Stacked File Qualification is set to FIRST, only the first file is used for selection processing. Since the first file matches the INCLDSNS pattern the whole volume set will be selected for processing.

When Stacked File Qualification is set to ANY then all files are used for selection processing, and if any file in the volume set is selected then all files will be processed. The first file does match the INCLDSNS pattern therefore the entire volume set will be selected for processing, even though the second and third files do not match the INCLDSNS pattern.

When Stacked File Qualification is set to ALL then all files are used for selection processing, and all the files must meet the selection criteria. The first file does match the INCLDSNS pattern but the second and third files do not, therefore the entire volume set will be rejected.

When Stacked File Qualification is set to EACH then each files is selected or rejected individually. The first file does match the INCLDSNS pattern so it will be selected for processing, however the second and third files do not match the INCLDSNS pattern so they will be rejected. Note that even though the second and third files were rejected if the Conversion job is running in MOVE mode then all three files will be expired after the first file is copied to the new output tape.