

z/OS DFSMS V1R3



Basic Tape Library Support (BTLS) User's Guide and Reference

z/OS DFSMS V1R3



Basic Tape Library Support (BTLS) User's Guide and Reference

Note

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 69.

Eighth Edition, March 2002

This edition applies to Version 1 Release 1 of Basic Tape Library Support (5655-056) for z/OS™ DFSMS Version 1 Release 3 (5694-A01), and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC26-7016-06.

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About this book

Note: This is a revision of Basic Tape Library Support (BTLS) (5655-056 (Version 1 Release 1)) for z/OS DFSMS (5694-A01 (Version 1 Release 3)).

This book describes the Basic Tape Library Support (BTLS) product used with the Tape Library Dataserver.

This book is for system programmers, system operators, and other data processing personnel who manage, maintain, or use the Tape Library Dataserver.

Required product knowledge

To use this product effectively, you should be familiar with:

- Assembler language
- Job control language
- Standard program linkage conventions
- Tape Library Dataserver.

The notational conventions used by BTLS follow the Access Method Services (AMS) conventions. See any of the AMS publications listed in “Referenced publications”. Each of these publications contains a “Notational Conventions” section.

Referenced publications

The following publications contain information concerning the Tape Library Dataserver:

Publication Title	Order Number
<i>IBM TotalStorage Enterprise Automated Tape Library (3494) Introduction and Planning Guide</i>	GA32-0448
<i>IBM TotalStorage Enterprise Automated Tape Library Operator Guide</i>	GC23-0449
<i>Magstar 3495 Introduction and Planning Guide</i>	GA32-0234
<i>Magstar 3495 Operator Guide</i>	GA32-0235
<i>z/OS DFSMS Access Method Services</i>	SC26-7394
<i>z/OS DFSMS Installation Exits</i>	SC26-7396
<i>z/OS MVS Using the Subsystem Interface</i>	SA22-7642
<i>z/OS MVS System Messages, Vol 1</i>	SA22-7631
<i>z/OS MVS System Messages, Vol 2</i>	SA22-7631
<i>z/OS MVS System Messages, Vol 3</i>	SA22-7633
<i>z/OS MVS System Messages, Vol 4</i>	SA22-7634
<i>z/OS MVS System Messages, Vol 5</i>	SA22-7635
<i>z/OS MVS System Messages, Vol 6</i>	SA22-7636
<i>z/OS MVS System Messages, Vol 7</i>	SA22-7637
<i>z/OS MVS System Messages, Vol 8</i>	SA22-7638
<i>z/OS MVS System Messages, Vol 9</i>	SA22-7639
<i>z/OS MVS System Messages, Vol 10</i>	SA22-7640

Publication Title	Order Number
<i>z/OS MVS System Codes</i>	SA22-7626
<i>z/OS MVS Data Areas, Vol 1 (ABEP-DALT)</i>	SA22-7626
<i>z/OS MVS Data Areas, Vol 2 (DCCB-ITZYRETC)</i>	GA22-7582
<i>z/OS MVS Data Areas, Vol 3 (IVT-RCWK)</i>	GA22-7583
<i>z/OS MVS Data Areas, Vol 4 (RD-SRRA)</i>	GA22-7584
<i>z/OS MVS Data Areas, Vol 5 (SSAG-XTLST)</i>	GA22-7584
<i>z/OS JES2 Data Areas, Vol 1 \$ALINDEX-\$EVT</i>	GA22-7528
<i>z/OS JES2 Data Areas, Vol 2 \$FCLWORK-\$OUTWORK</i>	GA22-7529
<i>z/OS JES2 Data Areas, Vol 3 \$PADDR-\$XRQ</i>	GA22-7530
<i>z/OS JES3 Data Areas, Volume 1</i>	GA22-7543
<i>z/OS JES3 Data Areas, Volume 2</i>	GA22-7544
<i>z/OS JES3 Data Areas, Volume 3</i>	GA22-7545
<i>z/OS JES3 Data Areas, Volume 4</i>	GA22-7546

Using LookAt to look up message explanations

LookAt is an online facility that allows you to look up explanations for z/OS messages, system abends, and some codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can access LookAt from the Internet at:

<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookat.html>

or from anywhere in z/OS where you can access a TSO command line (for example, TSO prompt, ISPF, z/OS UNIX System Services running OMVS).

To find a message explanation on the Internet, go to the LookAt Web site and simply enter the message identifier (for example, IAT1836 or IAT*). You can select a specific release to narrow your search. You can also download code from the *IBM Online Library Omnibus Edition z/OS Collection*, SK2T-6700 and the LookAt Web site so you can access LookAt from a PalmPilot (Palm VIIx suggested).

To use LookAt as a TSO command, you must have LookAt installed on your host system. You can obtain the LookAt code for TSO from a disk on your *IBM Online Library Omnibus Edition z/OS Collection*, SK2T-6700 or from the LookAt Web site. To obtain the code from the LookAt Web site, do the following:

1. Go to <http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookat.html>.
2. Click the **News** button.
3. Scroll to **Download LookAt Code for TSO and VM**.
4. Click the ftp link, which will take you to a list of operating systems. Select the appropriate operating system. Then select the appropriate release.
5. Find the **lookat.me** file and follow its detailed instructions.

To find a message explanation from a TSO command line, simply enter: **lookat message-id**. LookAt will display the message explanation for the message requested.

Note: Some messages have information in more than one book. For example, IEC192I has routing and descriptor codes listed in *z/OS MVS Routing and Descriptor Codes*. For such messages, LookAt prompts you to choose which book to open.

Accessing z/OS books on the internet

In addition to making softcopy books available on CD-ROM, IBM provides access to unlicensed z/OS softcopy books on the Internet. To find z/OS books on the Internet, first go to the z/OS home page:

<http://www.ibm.com/servers/eserver/zseries/zos/>

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Note: You cannot access the z/OS licensed books unless you have registered for access to them and received an e-mail confirmation informing you that your request has been processed.

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2. Click on **Library**.
3. Click on **zSeries**.
4. Click on **Software**.
5. Click on **z/OS**.
6. Access the licensed book by selecting the appropriate element.

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or other documentation:

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Be sure to include the name of the book, the part number of the book, version and product name, and if applicable, the specific location of the text you are commenting on (for example, a page number or a table number).

- Fill out one of the forms at the back of this book and return it by mail or by giving it to an IBM representative. If the form has been removed, address your comments to IBM Corporation, RCF Processing Department M86/050, 5600 Cottle Road, San Jose, California 95193-0001, U.S.A.

Summary of changes

The summary of changes informs you of changes to this book. Revision bars (|) in the left margin of the book indicate changes from the previous edition.

See “Summary of changes for SC26-7016-01, First Edition, June 1993” on page xix for a product highlight description of Basic Tape Library Support.

Summary of changes for SC26-7016-07, Eighth Edition, March 2002

Note: This is a revision of Basic Tape Library Support (BTLS) (5655-056 (Version 1 Release 1)) for z/OS DFSMS (5694-A01 (Version 1 Release 3)).

This book contains information that was previously presented in *Basic Tape Library Support User's Guide and Reference Version 1 Release 1*, SC26-7016-06.

New information

This edition includes the following new information:

- Revision information; see “Chapter 1. Introduction” on page 1.
- Device address ranges; see Table 8 on page 10.
- Installing tasks; see “Disable catalog name checking” on page 25.
- IEA301I message; see “Migration steps” on page 65.
- Required APAR; see Table 26 on page 66.
- Internet books; see “Accessing z/OS books on the internet” on page xiii.
- Licensed books on the internet; see “Accessing licensed books on the web” on page xiii.

Changed information

This edition includes the following changed information:

- Related publications; see “Referenced publications” on page xi.
- Making comments; see “How to send your comments” on page xiv.

Moved information

This edition includes moved information; see “Notices” on page 69.

Deleted information

This edition deleted references to the SecureWay[®] Security Server for OS/390[®].

This book contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

Starting with this edition, you may notice changes in the style and structure of some content in this book. For example, headings that use uppercase for the first letter of initial words only, and text that has a different look and format. The changes are ongoing improvements to the consistency and retrievability of information in our books.

Summary of changes for SC26-7016-06, Seventh Edition, September 2000

This book applies to Version 1 Release 1 of Basic Tape Library Support and contains information that was previously presented in *Basic Tape Library Support User's Guide and Reference*, SC26-7016-05.

Some of the BTLS functions described in this edition require the JDZ11DS offering or later. For offerings prior to JDZ11DS, the following PTFs are required: OW28989, OW26582, OW18860, OW27393, OW21730, and OW26135.

New information

This edition includes the new information about finding up-to-date BTLS information on the internet; see "BTLS on the web" on page 61.

Changed information

This edition includes the following changed information:

- An updated list of related publications is included; see "Referenced publications" on page xi.
- The notices, programming interface information, and trademarks are after the appendixes; see "Notices" on page 69.

Moved information

This edition does not include moved information.

Deleted information

This edition does not include deleted information.

Summary of changes for SC26-7016-05, Sixth Edition, March 1999

This book applies to Version 1 Release 1 of Basic Tape Library Support and contains information that was previously presented in *Basic Tape Library Support User's Guide and Reference*, SC26-7016-04.

Support for the BTLS functions described in this edition require either the JDZ11ES or JDZ11DS Program Offerings. For previous offerings, the following PTFs are required: OW28989, OW26582, OW18860, OW27393, OW21730, and OW26135.

New information

This edition includes the following new information:

- Migrating from BTLS to DFSMS/MVS®; see "Appendix D. Migration to DFSMS" on page 61.
- Using the RACF®, a component of the SecureWay Security Server for OS/390, protect-all option with BTLS; see "Define the BTLS usercatalog" on page 26.
- Finding up-to-date information about BTLS on the Web; see "BTLS on the web" on page 61

Changed information

This edition does not include changed information.

Moved information

This edition does not include moved information.

Deleted information

This edition does not include deleted information.

Summary of changes for SC26-7016-04, Fifth Edition, September 1997

This book applies to Version 1 Release 1 of Basic Tape Library Support and contains information that was previously presented in *Basic Tape Library Support User's Guide and Reference*, SC26-7016-03.

Support for the new BTLS functions described in this edition requires either the JDZ11DS Program Offering or for previous offerings: OW28989, OW26582, OW18860, OW27393, OW21730, and OW26135.

New information

This edition includes the following new information:

- **Allow BTLS and SMS tape to co-exist** - BTLS APAR OW03323 is used to enable SMS tape support for 3494/3495 tape library. The installation of OW03323 disables BTLS. APAR OW18860 allows some of the BTLS functions to be used after OW03323 is installed. The BTLS LIBRARY command can be used to create 'pseudo' libraries by associating a group of volumes with a group of non-library drives.

With OW03323 and OW18860 installed, the following BTLS LIBRARY commands can be used:

```
DEFINE    (define a volume in a BTLS library)
DELETE    (delete a volume from a BTLS library)
DEVICES   (define the devices in a BTLS library)
JOBNAMES  (define JOBNAMES that use a BTLS library).
LISTVOL   (list the volumes defined in a BTLS library)
OPTIONS   (define the BTLS operating options)
```

The APAR listed above (OW03323) is used to enable SMS tape library support on DFSMS/MVS Version 1 Release 1.

APAR OW17868 is used to enable SMS tape library support on DFSMS/MVS Version 1 Release 2 and DFSMS/MVS Version 1 Release 3. PTFs for OW18860 are available for BTLS releases JDZ111S, JDZ11BS and JDZ11CS.

For BTLS release JDZ11DS, APAR OW28259 is used to enable SMS tape library support on DFSMS/MVS Version 1 Release 4. The functions provided by OW18860 are included in BTLS release JDZ11DS.

- **Specify multiple volumes using the VOLUME parameter** - The BTLS LIBRARY command is changed to allow the VOLUME parameter to specify either a single volume or a range of volumes. The following are examples of the VOLUME parameter:

```
LIBRARY DEFINE VOLUME(ABC000)
LIBRARY DELETE VOLUME(ABC000-ABC025)
LIBRARY AUDIT  VOLUME(ABC000-ABC009)
```

- **BTLS Allocation Option "E"** - Allocation option "E" causes BTLS to direct allocations into or away from a BTLS library based on esoteric unit names. The following esoteric names are supported:

BTLSLIB1
BTLSLIB2
BTLSLIB3
BTLSLIB4
BTLSLIB5
BTLSLIB6
BTLSLIB7
BTLSLIB8

- **IBM 3590 Support** - OW20751 and OW21348 add support for the IBM 3590 Tape Drive.
- **Other changes** - Service changes have been added throughout the book.

Changed information

This edition does not include changed information.

Moved information

This edition does not include moved information.

Deleted information

This edition does not include deleted information.

Summary of changes for SC26-7016-03, Fourth Edition, June 1995

This book applies to Version 1 Release 1 of Basic Tape Library Support and contains information that was previously presented in *Basic Tape Library Support User's Guide and Reference*, SC26-7016-02.

Support for the new BTLS functions described in this edition, require either the JDZ11BS Program Offering or OW12877 (for previous offerings).

New information

This edition includes the following new information:

- **BTLS LIBRARY Command Options** - Additional LIBRARY command OPTIONS statements allow you to specify LIBAFFINITY, AUTODEMOUNT, and EXPDT98000. See "OPTIONS" on page 14 for more information.
- **Library Statistics** - The BTLS SMF type 94 record is now used to record library statistics. See "SMF record type 94 - IBM tape library statistics" on page 2 for more information.
- **Messages** - New messages have been added to support the MVS/SP™ 5.2 tape allocation SSI.
The description of many existing messages has been improved.
- **Error Recovery Table** - The error recovery procedures table, Table 25 on page 46, provides specific information about each of the messages reported to the operator by BTLS.
- **New Category Names** - The new category names, PURGE and EJECTM, have been added. PURGE allows you to purge a volume, and EJECTM allows you to list any manually ejected volumes. See "Category names" on page 23 for more information.

Changed information

This edition includes changed information; Installation Tasks - Chapter 3 is rewritten to better describe the installation of BTLS and also to provide tutorial information.

Moved information

This edition includes the information from Appendix D, "Parmlib Member BTLPRM00" that is moved into "Chapter 3. Installation tasks" on page 25.

Deleted information

This edition includes deleted information from Appendix D.; "Parmlib Member BTLPRM00" that is moved into "Chapter 3. Installation tasks" on page 25.

Summary of changes for SC26-7016-02, Third Edition, July 1994

This book applies to Version 1 Release 1 of Basic Tape Library Support and contains information that was previously presented in *Basic Tape Library Support User's Guide and Reference*, SC26-7016-01.

New information

This edition includes the following new information:

- **LIBRARY Command** - AUDIT: The new function, AUDIT, uses the robotic vision system to verify that a volume is physically present in a library.
REPORT: The new function, REPORT, lists information about the devices and volumes in a library.
- **Migration to DFSMS** - Use of the new LIBRARY MIGRATE command to migrate to DFSMS managed tape is described in "Appendix D. Migration to DFSMS" on page 61.
- **Controlling BTLS Library Functions** - New parameters used to control BTLS library functions used to be described in the former Appendix D, "Parmlib Member BTLPRM00", and are now included in "Chapter 3. Installation tasks" on page 25.
- **Messages and Codes** - New messages and codes are shown in "Chapter 4. Messages and codes" on page 35.

Changed information

This edition includes the following changed information:

- The LIBRARY command changes; the THRESHOLD function has been updated to allow separate threshold values for multiple categories and multiple libraries.
- Messages and codes information; see "Chapter 4. Messages and codes" on page 35.
- Message Display Exit; changes to the Message Display installation exit module IGXMSGEX are described in "Appendix B. installation exits" on page 55.

Moved information

This edition does not include moved information.

Deleted information

This edition does not include deleted information.

Summary of changes for SC26-7016-01, First Edition, June 1993

This book applies to Version 1 Release 1 of Basic Tape Library Support.

New information

The Basic Tape Library Support (BTLS) for the Tape Library Dataserver modifies or adds the following functions:

- Message display.
- Allocation.
- Dynamic device reconfiguration (DDR).
- Basic Tape Library Support LIBRARY command.
- IBM 3494 and 3495 attention messages.

This edition includes the following new information:

- **Message display** - Message display is the function that sends messages to the 3490 Message Display Pod. For Basic Tape Library Support, message display is modified to also send MOUNT and DEMOUNT commands to the Tape Library Dataserver. These new commands instruct the Tape Library Dataserver to mount a library volume on a drive, or to demount a volume and return it to the library storage rack.

The MOUNT command sent to the Tape Library Dataserver requests that either a specific (PRIVATE) volume be mounted or that ANY volume from the scratch category be mounted. When a volume is demounted, the DEMOUNT command instructs the Tape Library Dataserver to assign the volume to the specific (PRIVATE) category.

- **Allocation** - The Basic Tape Library Support uses catalog records to describe each library configuration. Catalog records are also used to define allocation rules. Each volume in a library is also defined by a catalog entry that names the library in which the volume resides.

Basic Tape Library Support uses catalog records to ensure that the appropriate device is allocated to mount a volume. The set of devices that would normally be eligible for an allocation is modified by Basic Tape Library Support to include only **library** devices or only **manual** devices.

For specific volume requests (private volumes), if the volume is cataloged as a library volume, then only devices in the Tape Library Dataserver are used to satisfy the allocation. If the volume is not cataloged as a library volume, then only manual devices are used to satisfy the allocation.

For non-specific requests (scratch volumes), scratch allocation rules are used to determine whether a manual device or a library device is used to satisfy the allocation. Allocation rules are established using the LIBRARY command.

- **Dynamic device reconfiguration (DDR)** - Dynamic device reconfiguration (DDR) is the function used to swap a volume to another device following a permanent I/O error. Basic Tape Library Support changes to DDR ensure that when a DDR swap is from a library device, that only devices in the same library are used to swap. Likewise, when a DDR swap is from a manual device, only manual devices are used to swap.
- **Basic Tape Library Support LIBRARY command** - Basic Tape Library Support adds the new access method services LIBRARY command. The LIBRARY command is used to perform functions such as:
 - Change volume status from private to scratch
 - Define library devices
 - Define allocation rules for library devices
 - Obtain lists of library volumes from the Tape Library Dataserver
 - Create or delete catalog records for library volumes

- Perform IBM 3494 and 3495 functions such as mount, demount, ejection of cartridges, and integrated cartridge loader (ICL) setup
- Can be RACF protected.

The access method services LIBRARY command is used to perform operations needed to manage tape volumes in a Tape Library Dataserver.

- **Tape Library Dataserver attention messages** - The Tape Library Dataserver reports MOUNT and DEMOUNT completion status and library errors to the host with attention messages. To return messages to the host, the Tape Library Dataserver presents attention and the host responds by reading a message from the Tape Library Dataserver. To report messages to the system operator, the Basic Tape Library Support provides the Tape Library Dataserver the ability to read attention messages and report error status.

Changed information

This edition does not include changed information.

Moved information

This edition does not include moved information.

Deleted information

This edition does not include deleted information.

Chapter 1. Introduction

Note: This is a revision of Basic Tape Library Support (BTLS) (5655-056 (Version 1 Release 1)) for z/OS DFSMS (5694-A01 (Version 1 Release 3)).

This document describes the Basic Tape Library Support (BTLS) for the Tape Library Dataserver. The BTLS support modifies or adds the following functions:

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Message display

Message display is the function that sends messages to the 3490 or 3590 message display. For BTLS, message display is modified to also send mount and demount commands to the IBM 3494 and 3495. These new commands instruct the IBM 3494 and 3495 to mount a library volume on a drive, or to demount a volume and return it to the library storage rack.

Mount commands sent to the IBM 3494 and 3495 request that either a specific (PRIVATE) volume be mounted or that any volume from a scratch category be mounted. When a volume is demounted, BTLS may change the category assignment of the volume as follows:

Table 1. Volume demount - category assignment

PRIVATE	A volume is assigned to the PRIVATE category when a KEEP or RETAIN demount is issued ("Kvolser" or "Rvolser" is displayed on the drive).
UNCHANGED	A volume is left in its current category when: <ul style="list-style-type: none">• A PUBLIC demount is issued. ("Dvolser" is displayed on the drive).• No volser is specified for a demount.
ERROR	When the volser specified in a demount does not match the external label of the volume, the volume is assigned to the ERROR category.

Allocation

BTLS support uses catalog records to describe each library configuration and to define allocation rules. Each volume in a library is also defined by a catalog record that names the library in which the volume resides.

BTLS uses catalog records to ensure that the appropriate device is allocated to mount a volume. The set of devices that would normally be eligible for an allocation is modified by BTLS to include only library devices or only non-library devices.

For specific volume requests (private volumes), if the volume is cataloged as a library volume, then only devices in the IBM 3494 and 3495 are used to satisfy the

allocation. If the volume is not cataloged as a library volume, then the volume is assumed to reside outside of a library and only non-library devices are used to satisfy the allocation.

For nonspecific requests (scratch volumes), scratch allocation rules are used to determine whether a library device or a non-library device is used to satisfy the allocation. Library definitions, volume records and allocation rules are established using the LIBRARY command.

Dynamic device reconfiguration (DDR)

Dynamic device reconfiguration (DDR) is the function used to swap a volume to another device following a permanent I/O error. BTLS changes to DDR ensure that DDR will swap to a device of the same type as the original device. For example, if the original device is in a library, DDR will swap it to a library device in the same library.

LIBRARY command

Basic Tape Library Support adds the new access method services LIBRARY command. The LIBRARY command is used to perform functions such as:

- Change volume status from PRIVATE to SCRATCH.
- Define library devices.
- Define allocation rules for library devices.
- Obtain lists of library volumes from the Tape Library Dataserver.
- Create or delete catalog records for library volumes.
- Perform IBM 3494 and 3495 functions such as mount, demount, ejection of cartridges, and integrated cartridge loader (ICL) setup.

IBM 3494 and 3495 attention messages

The Tape Library Dataserver reports mount and demount completion status and library errors to the host with attention messages. To return messages to the host, the IBM 3494 and 3495 presents device attention status and the host is expected to respond with an I/O command to read a message from the IBM 3494 and 3495.

BTLS includes software support to read IBM 3494 and 3495 attention messages and report error status to the system operator. Most of the attention messages received by the host are used to report the normal completion of a mount or demount; these messages are read by BTLIS but are not reported to the system operator.

SMF record type 94 - IBM tape library statistics

A 3494 or 3495 Tape Library accumulates statistics over the period of one hour. These statistics represent the activity of the tape library that results from all hosts attached to the library.

At the end of each hour, the library calculates composite statistics about the activity of all devices in the library and sends a statistical data message to all attached hosts. BTLIS writes an SMF type 94 record containing the library statistical data.

IECSMF94 is the mapping macro for the SMF type 94 record. IECSMF94 resides in SYS1.MACLIB.

Notational conventions

The notational conventions used by BTLS follow the Access Method Services (AMS) conventions. See any of the AMS publications listed in “Referenced publications” on page xi. Each of these publications contains a “Notational Conventions” section.

Chapter 2. Using the LIBRARY command

Basic Tape Library Support (BTLS) adds the new access method services LIBRARY command to perform operations needed to manage tape volumes in a Tape Library Dataserver such as:

- Change volume status from PRIVATE to SCRATCH.
- Define library devices.
- Define allocation rules for library devices.
- Obtain lists of library volumes from the IBM 3494 and 3495.
- Create or delete catalog records for library volumes.
- Perform IBM 3494 and 3495 functions such as mount, demount, ejection of cartridges, and integrated cartridge loader (ICL) setup.

The LIBRARY command has the same requirements and rules as existing access method services commands. For example, commands are continued from one line to the next with a '-' or '+'. Access method services modal commands (IF,THEN) may be used to control a series of LIBRARY commands. Commands and parameters must be separated from each other by one or more blanks. Comments may be added whenever a blank can appear, and are distinguished by /* and */ delimiters. See any of the AMS publications listed in "Referenced publications" on page xi. Each of these publications contains a "Notational Conventions" section.

See "Library names" on page 24 for a list of the supported library names and "Category names" on page 23 for a list of the category names used by the LIBRARY command.

JCL requirements

The IDCAMS LIBRARY command can be executed as either a TSO command or with JCL. When JCL is used, the following example describes the DD requirements.

```
//LIBTEST JOB .....
//STEP1 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBIN DD DISP=SHR,DSN=TMS.OUTPUT
//LIBOUT DD DISP=SHR,DSN=INVENTORY.OUTPUT
//SYSIN DD *
LIBRARY SETCATEGORY VOLSER(VOL001) CATEGORY(SCRATCH) UNIT(803)
/*
```

LIBIN - LIBIN is an optional DD statement that identifies a data set containing a list of volume serial numbers. The LIBRARY commands that support LIBIN are AUDIT, DEFINE, DELETE and SETCATEGORY. These commands perform *volume* operations, and the target volumes can either be a single volume specified with the VOLSER parameter or a list of volumes from LIBIN. When the VOLSER parameter is specified it is used. When the VOLSER parameter is omitted LIBIN is used. The LIBIN data set must contain 80 byte records, with each record containing a *volser* starting in column one.

LIBOUT - The LIBOUT DD statement identifies a data set used by the LIBRARY INVENTORY and LIBRARY LISTVOL commands to list volume serial numbers. The volume serial numbers in LIBOUT may be used as LIBIN data for other library

commands such as SETCATEGORY. LIBOUT is required by the LIBRARY INVENTORY and LIBRARY LISTVOL commands and is ignored by all other LIBRARY commands.

A LIBOUT data set must be allocated with LRECL=80.

TSO requirements

To use the LIBRARY command under TSO, the command must be authorized. “Chapter 3. Installation tasks” on page 25 describes how to authorize the LIBRARY command and how to control the use of the LIBRARY command with RACF. After installation, LIBRARY commands can be executed from the TSO command line as show in the following examples:

```
LIBRARY SETCAT VOLSER(VOL001) CATEGORY(SCRTCH) UNIT(803)
LIBRARY REPORT
LIBRARY OPTIONS (JEE)
LIBRARY COUNTS UNIT(803)
```

The LIBRARY LISTVOL and LIBRARY INVENTORY commands, require an output dataset. The following is an example of the LISTVOL command being executed as a TSO command:

```
ALLOCATE FILE(LIBOUT) DUMMY LRECL(80) RECFM(F B)
LIBRARY INVENTORY CATEGORY(ERROR) UNIT(803)
```

Note: In the example, the INVENTORY command is being used to display a list of volumes in the error category on the TSO console. Because the LIBOUT file is not needed, it is allocated as DUMMY.

LIBRARY command description

The syntax of the LIBRARY command follows. A description of each of the LIBRARY command functions follows the command syntax.

Table 2. LIBRARY command functions

AUDIT	UNIT(<i>unit</i>) [VOLSER(<i>volser</i>)] [FORCE]
COUNTS	UNIT(<i>unit</i>)
DEFINE	[VOLSER(<i>volser</i>)] [LIBNAME(<i>libname</i>)]
DELETE	[VOLSER(<i>volser</i>)] [LIBNAME(<i>libname</i>)]
DEMOUNT	UNIT(<i>unit</i>)
DEVICES	(<i>devicerange devicerange ...</i>) [LIBNAME(<i>libname</i>)]
INVENTORY	UNIT(<i>unit</i>) CATEGORY(<i>category</i>)
JOBNAMES	(<i>jobname...</i>) [LIBNAME(<i>libname</i>)]
LISTVOL	[LIBNAME(<i>libname</i>)]
MOUNT	UNIT(<i>unit</i>) [VOLSER(<i>volser</i>)]
OPTIONS	(<i>option</i>)
REPORT	[LIBNAME(<i>libname</i>)]
RESETACL	UNIT(<i>unit</i>)
RESETDEVICE	UNIT(<i>unit</i>)
SETACL	UNIT(<i>unit</i>) CATEGORY(<i>category</i>)

Table 2. LIBRARY command functions (continued)

SETCATEGORY	UNIT(<i>unit</i>) CATEGORY(<i>category</i>) [VOLSER(<i>volser</i>)]
SETCEXIT	UNIT(<i>unit</i>)
SETDEVICE	UNIT(<i>unit</i>) CATEGORY(<i>category</i>)
THRESHOLD	(<i>count</i>) [CATEGORY(<i>category</i>)] [LIBNAME(<i>libname</i>)]

AUDIT

Table 3. AUDIT parameter

LIBRARY	AUDIT	UNIT(<i>unit</i>) [VOLSER(<i>volser</i>)] [FORCE]
---------	-------	---

AUDIT

Use the robotic vision system to verify that a volume is physically present in the library. AUDIT sends an order to the library and then waits for the audit to complete. Only ONE audit job (or TSO command) can be active at one time from a host operating system. If more than one audit is attempted, the second audit will fail with message: BTLS041I AUDIT ALREADY IN PROGRESS.

Note: It is recommended that the LIBRARY AUDIT command be executed from the batch environment and not as a TSO command. Audits are given a very low priority by the Library Manager, and may take a long time to complete. While the TSO LIBRARY AUDIT command is waiting for an audit to complete, the terminal will be unavailable for other commands.

UNIT(*unit*)

Specifies the address used to send the audit command to the library. Any device in the library can be specified. In a multi-library environment, the device specified determines the library in which the audit is performed.

VOLSER(*volser*)|VOLSER(*volser-volser*)

The volume(s) to be audited. To audit a list of volumes, the VOLSER parameter is omitted and the LIBIN data set is used to obtain volume serial numbers.

The VOLSER parameter can be specified using either the alias name VOLUME or the abbreviated name VOL. VOLSER can be used to specify either a single volume or a range of volumes. Use the following rules to specify a range of volume serial numbers:

- Specify six character VOLSERS, separated by a dash (-)
- The first 3 characters of each VOLSER must be the same
- The last 3 characters of each volume must be numeric.

FORCE

When an audit abnormally terminates, a subsequent audit can receive message "BTLS041I MOUNT ALREADY IN PROGRESS" even though no audit is in progress. Specify the FORCE parameter to bypass the BTLS041I condition.

In the following example an audit is to be performed to verify that the 10 volumes ABC000 through ABC009 are in the library addressed by device 123.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY AUDIT UNIT(123) VOLSER(ABC000-ABC009)
```

COUNTS

Table 4. COUNTS parameter

LIBRARY	COUNTS	UNIT(<i>unit</i>)
---------	--------	---------------------

COUNTS

Obtain a count of all of the volumes in each category in a library. The count report is written to SYSPRINT.

UNIT(*unit*)

Specifies the address used to send orders to the library. Any device in the library can be specified. In a multi-library environment, the device specified determines the library from which the counts are to be obtained.

In the following example a volume count of all categories is to be obtained.

```
//LIBJOB JOB  
// EXEC PGM=IDCAMS  
//SYSPRINT DD SYSOUT=A  
//SYSIN DD *  
LIBRARY COUNTS UNIT(123)
```

DEFINE

Table 5. DEFINE parameter

LIBRARY	DEFINE	[VOLSER(<i>volser</i>)] [LIBNAME(<i>libname</i>)]
---------	--------	---

DEFINE

Create a catalog 'volume' entry for the volume specified on the VOLSER parameter, or obtained from the LIBIN data set if the VOLSER parameter was not specified. The library name specified by the LIBNAME parameter is included in the catalog entry. For specific volume requests, the catalog entry is used by allocation to ensure that volumes residing in a library are allocated to drives in the proper library.

VOLSER(*volser*)|VOLSER(*volser-volser*)

Identifies the volume(s) to be cataloged. To process a list of volumes, the VOLSER parameter can be omitted and the LIBIN data set is used to obtain volume serial numbers.

The VOLSER parameter can be specified using either the alias name VOLUME or the abbreviated name VOL. VOLSER can be used to specify either a single volume or a range of volumes. Use the following rules to specify a range of volume serial numbers:

- Specify six character VOLSERs, separated by a dash (-)
- The first 3 characters of each VOLSER must be the same
- The last 3 characters of each volume must be numeric.

LIBNAME(*libname*)

Specifies the tape library name that is included in the catalog record created for a volume (see "Library names" on page 24). If LIBNAME(*libname*) is not specified, the default library name(LIB1) is used.

In this example volume SYS001 is defined in the catalog as residing in library LIB1; the LIBRARY command is being issued as a TSO command.


```
TSO LIBRARY DEFINE VOLSER(SYS001)
```

In this example all of the volumes listed in the LIBIN data set are defined in the catalog as residing in library LIB1.

```
//LIBJOB2 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//LIBIN    DD  DSN=LIB1.VOLUMES
//SYSIN    DD  *
          LIBRARY DEFINE
```

In this example all of the volumes listed in the LIBIN data set will be defined in the catalog as residing in library LIB2.

```
//LIBJOB3 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//LIBIN    DD  DATA
T11111
T22222
/*
//SYSIN    DD  *
          LIBRARY DEFINE LIBNAME(LIB2)
```

DELETE

Table 6. DELETE parameter

LIBRARY	DELETE	[VOLSER(<i>volser</i>)] [LIBNAME(<i>libname</i>)]
---------	--------	---

DELETE

Delete either volume or library catalog records. A volume catalog record names the library in which the volume resides and is created by the LIBRARY DEFINE command. To delete a single volume record the VOLSER(*volser*) parameter can be used. To delete more than 1 volume record the LIBIN data set can be used to provide a list of *volser*s.

Library records are those catalog records that define the devices and jobnames associated with a library name. Library records are created by the LIBRARY DEVICES and LIBRARY JOBNAMEs commands and are deleted when LIBNAME is specified with the DELETE command.

LIBNAME(*libname*)

Identifies the library JOBNAMEs and DEVICES records to be uncataloged.

VOLSER(*volser*)|VOLSER(*volser-volser*)

Identifies the volume(s) to be uncataloged. To process a list of volumes, the VOLSER and LIBNAME parameters are omitted and the LIBIN data set is used to obtain volume serial numbers.

The VOLSER parameter can be specified using either the alias name VOLUME or the abbreviated name VOL. VOLSER can be used to specify either a single volume or a range of volumes. Use the following rules to specify a range of volume serial numbers:

- Specify six character VOLSERs, separated by a dash (-).
- The first 3 characters of each VOLSER must be the same.
- The last 3 characters of each volume must be numeric.

In this example volume SYS001 is deleted from the catalog.

```
TSO LIBRARY DELETE VOLSER(SYS001)
```

In this example all of the volumes listed in the dataset LIB1.VOLUMES.PURGED will be deleted from the catalog.

```
//LIBJOB2 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//LIBIN    DD  DSN=LIB1.VOLUMES.PURGED
//SYSIN    DD  *
           LIBRARY DELETE
```

In this example the JOBNAMES and DEVICES records that were defined for LIB3 will be deleted from the catalog.

```
TSO LIBRARY DELETE LIBNAME(LIB3)
```

DEMOUNT

Table 7. DEMOUNT parameter

LIBRARY	DEMOUNT	UNIT(<i>unit</i>)
---------	---------	---------------------

DEMOUNT

De-mount a volume from the drive specified by the UNIT parameter. If a volume to be demounted is ready on the drive, it is unloaded as part of the demount operation.

UNIT(*unit*)

Specifies the address of the device.

In this example, the volume on unit 123 is to be demounted.

```
TSO LIBRARY DEMOUNT UNIT(123)
```

DEVICES

Table 8. DEVICES parameter

LIBRARY	DEVICES	(<i>devicerange devicerange...</i>) [LIBNAME(<i>libname</i>)]
---------	---------	---

DEVICES

Define the device addresses for a library.

devicerange

From 1 to 8 *devicerange*'s may be specified. Each *devicerange* must contain 6 characters, where the first 3 characters define the starting address and the second 3 characters define the ending address. The ending address must be greater than or equal to the starting address. To specify a single address, the starting address and ending address must specify the same address (for example, 183183).

Notes:

1. No test is made to ensure that valid addresses are specified. If invalid addresses are specified the results are unpredictable.

2. The LIBRARY DEVICES command results in the creation of a catalog record named SYS1.BTLS.LIB.LIBn (n is a number from 1 to 8 that corresponds to the library name). Before the catalog record is created, any existing catalog record is deleted. This means that if you are adding devices to an existing BTLS library definition, you must specify both the old device numbers and the new device numbers that are being added.
3. BTLS only supports device numbers in the range 000-FFF.
4. Up to 8 device ranges may be specified for each LIBNAME.
5. Ranges must be specified by changing only the last digit of the address. For example, the range of devices 180 to 1AF must be specified as three ranges (18018F 19019F 1A01AF).

LIBNAME(*libname*)

Specifies the name of the library containing the devices (see “Library names” on page 24).

In this example:

1. In the first line of the example, library LIB1(the default), is defined as containing devices 180 to 18F and 190 to 19F.
2. In the second line of the example, library LIB2 is defined as containing devices 1A0 to 1AF and 1B0 to 1BF.

Example:

```

//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY DEVICES ( 18018F 19019F )
LIBRARY DEVICES ( 1A01AF 1B01BF ) LIBNAME(LIB2)

```

INVENTORY

Table 9. INVENTORY parameter

LIBRARY	INVENTORY	UNIT(<i>unit</i>)	CATEGORY(<i>category</i>)
---------	-----------	---------------------	-----------------------------

INVENTORY

Obtain a *volser* list for all of the volumes in the *category* specified by the CATEGORY parameter. The inventory list is placed into the data set defined by the LIBOUT DD statement.

UNIT(*unit*)

Specifies the address used to send the inventory order to the library.

CATEGORY(*category*)

Specifies the category to be inventoried (see “Category names” on page 23).

Note: Specify CATEGORY(ALL) to get a list of all volumes in the library. The volumes are listed in ascending order (category is ignored). The only volumes not included in the list are cleaner volumes and service volumes. When a library is partitioned between 2 or more systems, the INVENTORY CATEGORY(ALL) command allows a single system to obtain an inventory for all of the partitions.

The following is an example of category ALL:

```

LIBRARY INVENTORY UNIT(123) CATEGORY(ALL)

```

In this example, an inventory list is to be obtained for all of the volumes in the INSERT category. The *volser* list is created in dataset VOLUME.LIST. The SETCATEGORY command will cause the volumes to be placed in the scratch category in the IBM 3494 and 3495 library manager inventory. The DEFINE command will cause the volumes to be defined in the system catalog as residing in LIB1.

```
//LIBJOB JOB
//      EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBOUT DD DSN=VOLUME.LIST,DISP=(NEW,KEEP),VOL=SER=DAS001,
//      UNIT=3380,DCB=(RECFM=FB,LRECL=80),SPACE=(CYL,(1,1))
//LIBIN DD DSN=VOLUME.LIST,DISP=(OLD,KEEP),VOL=SER=DAS001,
//      UNIT=3380
//SYSIN DD *
LIBRARY INVENTORY UNIT(123) CATEGORY(INSERT)
LIBRARY SETCATEGORY UNIT(123) CATEGORY(SCRATCH)
LIBRARY DEFINE
```

JOBNAMES

Table 10. JOBNAMES parameter

LIBRARY	JOBNAMES	(<i>jobname...</i>)[LIBNAME(<i>libname</i>)]
---------	----------	--

JOBNAMES

Define the list of job names (and procedure names) that should be directed to a library for scratch allocations. Jobnames are not required, they are only used when option 'J' is specified (see "OPTIONS" on page 14).

jobname

Up to 50 jobnames can be defined for each library (see "Library names" on page 24 for a list of supported names). Jobnames that are less than 8 characters are used as wildcards. The default library name is LIBNAME(LIB1)

LIBNAME(*libname*)

Name of the library to which jobs are to be allocated. (see "Library names" on page 24).

In this example, the following jobnames would result in scratch allocations to LIB1:

```
AUTOTAPE
LIB1JOB8
XXXTEST
YYANYJOB
ZLIB1JOB
```

```
//LIBJOB JOB
//      EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY JOBNAMES (AUTOTAPE LIB1JOB XXX YY Z)
```

Notes:

1. BTLS allocation searches for jobname matches beginning with the jobnames listed for LIB1, then LIB2-LIB8 jobnames until a match is found (or until all library jobnames are compared).
2. When the JOBNAMES option is chosen and BTLS allocation does not find a match for a jobname it retries the search looking for a started procedure name match.

- The LIBRARY JOBNAMES command causes an existing jobnames catalog record to be deleted and a new one created. For this reason the LIBRARY JOBNAMES command should only be executed when jobs are not using the IBM 3494 and 3495. Also, the LIBRARY JOBNAMES command file should be maintained as a master file to be modified when jobnames changes are required.

LISTVOL

Table 11. LISTVOL parameter

LIBRARY	LISTVOL	[LIBNAME(<i>libname</i>)]
---------	---------	-----------------------------

LISTVOL

List the volumes that are cataloged for a library. The volumes are listed in both SYSPRINT and LIBOUT. SYSPRINT lists 10 volumes per line, while the LIBOUT listing is 1 volume per record.

LIBNAME(*libname*)

Name of the library containing the volumes to be listed (see “Library names” on page 24).

In this example, all of the volumes that are cataloged for LIB1 are listed. Only the SYSPRINT listing is to be used.

```
//LIBJOB1 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBOUT   DD DUMMY,DCB=(LRECL=80,RECFM=FB)
//SYSIN    DD *
          LIBRARY LISTVOL
```

In this example, all of the volumes that are cataloged for LIB2 are listed. Dataset LIB2.VOLUMES will contain a sequential list of the volumes cataloged for LIB2.

```
//LIBJOB2 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBOUT   DD DSN=LIB2.VOLUMES
//SYSIN    DD *
          LIBRARY LISTVOL LIBNAME(LIB2)
```

MOUNT

Table 12. MOUNT parameter

LIBRARY	MOUNT	UNIT(<i>unit</i>) [VOLSER(<i>volser</i>)]
---------	-------	---

MOUNT

Mount a volume on the drive specified by the UNIT parameter. If a volume is already mounted on the drive, that volume is unloaded and demounted, before the specified volume is mounted.

UNIT(*unit*)

Specifies the address of the device.

VOLSER(*volser*)

Specifies the *volser* to be mounted. If VOLSER(*volser*) is not specified, or if VOLSER(SCRATCH) is specified, a scratch volume is mounted.

The system default category name is SCRTCH. The system default may be changed by specifying a category name in parmlib member BTLPRM00. The category name specified in BTLPRM00 becomes the system default category name. The SETDEVICE command can be used to indicate that a device should use a scratch category name other than the system default. The category used to satisfy a scratch mount issued to a particular device is determined as follows:

- If the SETDEVICE command was used to associate a category name with the device, the category named in SETDEVICE is used.
- If RESETDEVICE was used to restore the default state of the device (or SETDEVICE has never been issued to the device), the system default category name is used. The system default category is determined as follows:
 - If BTLPRM00 was used to specify a scratch category name, that name is used as the system default.
 - If BTLPRM00 was not created, or did not specify a category name, then SCRTCH is used as the system default category name.

Note: The category used to satisfy a scratch mount is not affected by the state of an ACL. If the ACL is active with volumes from the category being mounted, the mount is satisfied by an ACL feed. If the ACL is inactive, or active with volumes from a category other than the category being mounted, the mount is satisfied by a storage access (robotic mount).

The VOLSER parameter can be specified using either the alias name VOLUME or the abbreviated name VOL.

In this example, volume VOL001 is be mounted on unit 123.

```
//LIBJOB1 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//SYSIN     DD  *
          LIBRARY MOUNT UNIT(123) VOLSER(VOL001)
```

In this example, a scratch volume is mounted on unit 123.

```
//LIBJOB2 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//SYSIN     DD  *
          LIBRARY MOUNT UNIT(123) VOLSER(SCRTCH)
```

In this example, a scratch volume is mounted on unit 123.

```
//LIBJOB3 JOB
//          EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//SYSIN     DD  *
          LIBRARY MOUNT UNIT(123)
```

OPTIONS

Table 13. OPTIONS parameter

LIBRARY	OPTIONS	(option)
---------	---------	----------

OPTIONS

The OPTIONS command is used to define the BTLS option characters and to enable or disable other BTLS options. After the OPTIONS command is executed the current state of all BTLS options will be displayed. To display the current state of all BTLS options without changing any options use the LIBRARY OPTIONS(DISPLAY) command.

option

The *option* parameter supplies either the three option characters or the name of an option.

XXX

The three option characters **XXX** are described in Table 14 on page 16. The first option character is used to define the allocation rules regarding scratch allocations. The second option character is used to enable, disable or trace the BTLS allocation support. The third option character is used to enable, disable or trace the BTLS DDR support. If options characters are not specified, the default is **IDD**.

AUTODEMOUNT | AUTO

Indicates that library volumes should be automatically demounted if they become mounted on UNALLOCATED devices. When AUTODEMOUNT is enabled and BTLS detects a mount completion for an **unallocated** device, the volume will be unloaded and demounted. See “Create SYS1.PARMLIB member BTLPRM00” on page 28 for more information about the use of AUTODEMOUNT.

NOAUTODEMOUNT | NOAU

Indicates that library volumes should remain mounted if they become mounted on **unallocated** devices.

LIBAFFINITY | LIBA

Indicates that BTLS should 'break' affinity when an invalid UNIT=AFF condition is detected. If LIBAFFINITY is not used, invalid affinity is reported by message BTLS104I and the job is terminated. See “Create SYS1.PARMLIB member BTLPRM00” on page 28 for more information about the use of LIBAFFINITY.

NOLIBAFFINITY | NOLI

Indicates that BTLS should report invalid affinity with message BTLS104I and terminate the job.

EXPDT98000 | EXPD

The EXPDT98000 option allows a duplicate of a BTLS library volume to be mounted on a drive outside the library.

When the EXPDT98000 option is used, and a DD statement includes EXPDT=98000, BTLS will not validate or interfere with the allocation. This allows you to allocate a drive outside the library for a volser that is defined to BTLS as a library volume.

NOEXPDT98000 | NOEX

Indicates that BTLS should influence allocation without regard to EXPDT=98000.

DISPLAY

Indicates that no options should be changed, but that the status of all options should be displayed as in the following example. **Note:** The option characters specified in the first example are 'JEE'. The first character(J) indicates that JOBNAME is to be used to determine when a scratch allocation should be directed to a library. The second character(E) indicates

that BTLS allocation support should be enabled. The third character(E) indicates that BTLS DDR support should be enabled.

```
OPTION CHARACTERS = JEE
OPTION PARAMETERS:
  AUTODEMOUNT= YES
  LIBAFFINITY= NO
  EXPDT=98000= YES
```

In this example enables the BTLS AUTODEMOUNT function and the third example disables the LIBAFFINITY function. The last example displays the current status of the BTLS options.

```
LIBRARY  OPTIONS (JEE)
LIBRARY  OPTIONS (AUTO)
LIBRARY  OPTIONS (NOLI)
LIBRARY  OPTIONS (DISPLAY)
```

Table 14. Specifying BTLS OPTION characters

1	2	3	Description
J			<p>Scratch allocation is based on JOBNAME. When this option is used, scratch allocations to the IBM 3494 and 3495 require that the jobname or procedure name be defined with the LIBRARY JOBNAME command. For a job requiring scratch allocation, when the jobname or procname is defined, the allocation is directed to the devices in the library associated with the jobname. The BTLS allocation code tests for a jobname match first, then tests for a match on the procedure name.</p> <p>When neither a jobname nor procedure name is matched, the allocation is directed away for ALL libraries.</p>
E			<p>Allocation option “E” causes BTLS to direct allocations into or away from a BTLS library based on esoteric unit names. The following esoteric names are supported:</p> <pre>BTLSLIB1 BTLSLIB2 BTLSLIB3 BTLSLIB4 BTLSLIB5 BTLSLIB6 BTLSLIB7 BTLSLIB8</pre> <p>To use the “E” option to manage the BTLS library LIB1, do the following:</p> <ul style="list-style-type: none"> • Define the devices in LIB1 to BTLS as follows: LIBRARY DEVICES (18018F) LIBNAME(LIB1). • Create esoteric name BTLSLIB1 for devices 180-18F. • To allocate LIB1, change JCL to specify UNIT=BTLSLIB1. • Specify LIBRARY OPTIONS(EEE) to activate the BTLS esoteric allocation support. • To allocate away from LIB1, no change is needed. Any allocation other than UNIT=BTLSLIB1 is directed away from LIB1 by BTLS.
A			<p>ALL scratch allocations should go to a library device. BTLS allocation assist will exclude all non-library devices, thus directing the allocation to a device in ANY library.</p>

Table 14. Specifying BTLS OPTION characters (continued)

1	2	3	Description
M			ALL scratch allocations should go to a manual device. BTLS allocation assist will exclude all library devices, thus directing the allocation to any device outside of a library.
I			Scratch allocations may go to any device. The I option assumes that some factor such as esoteric name is being used to control scratch allocations. BTLS allocation assist does not influence scratch allocations when the I option is used.
	E		Enable BTLS allocation support.
	D		Disable BTLS allocation support.
	T		Trace BTLS allocation support (for diagnostic purposes).
		E	Enable BTLS DDR support.
		D	Disable BTLS DDR support.
		T	Trace BTLS DDR support (for diagnostic purposes).

REPORT

Table 15. REPORT parameter

LIBRARY	REPORT	[LIBNAME(libname)]
---------	--------	--------------------

REPORT

- Create a report for the library specified by the LIBNAME(*libname*) parameter. The report lists all of the devices defined by the LIBRARY DEVICES command. For each device, the following information is provided:
- Scratch category used to satisfy scratch mount requests.
 - Scratch category assigned to the ICL.
 - VOLSER currently mounted.

Following the device report, a category 'count' report is provided.

LIBNAME(*libname*)

Name of the library to be reported (see "Library names" on page 24).

In this example, two reports will be generated. The first will report LIB1 information and the second will report LIB2 information.

```
LIBRARY REPORT
LIBRARY REPORT LIBNAME(LIB2)
```

The following is an example of the Library Report:

```
LIB1 DEVICES:   SCRATCH:   ACL STATUS:   VOLUME MOUNTED:
-----
          9A0    SCRATCH1(5)   SCRATCH1     V11111(PRIVATE)
          9A1    SCRATCH2     SCRATCH2     V22222(SCRATCH2)
          9A2(2)  SCRATCH1
          9A3(3)  SCRATCH1
          9A4(4)
          9A5(6)
```

```
NOTE(2): LIBRARY MANAGER HAS MARKED THE DEVICE NOT AVAILABLE
NOTE(3): DEVICE IS NOT AVAILABLE TO THE SYSTEM
NOTE(4): DEVICE IS NOT DEFINED TO THE SYSTEM
NOTE(5): SYSTEM DEFAULT SCRATCH CATEGORY
```

NOTE(6): NOT A 3480, 3490, OR 3590 DEVICE

LIB1	VOLUMES:	TOTAL:	THRESHOLD:
	-----	-----	-----
	SCRATCH1	4500	2000
	SCRATCH2	600	200
	SCRATCH5	300	200
	PRIVATE	2300	

The sample report provides the following information about library LIB1:

- Device 9A0 will use the SCRATCH1 category for scratch mounts, and the stacker for 9A0 is loaded with SCRATCH1 cartridges. SETDEVICE has not been issued to device 9A0, so the default scratch category is used for scratch mounts. The ACL is loaded with SCRATCH1 cartridges as a result of a SETACL command. Private volume V11111 is currently mounted on 9A0.
- Device 9A1 will use the SCRATCH2 category for scratch mounts, and the stacker for 9A1 is loaded with SCRATCH2 cartridges. SETDEVICE was issued to device 9A1 to set the scratch mount category to SCRATCH2. The ACL is loaded with SCRATCH2 cartridges as a result of a SETACL command. SCRATCH2 volume V22222 is currently mounted on 9A1.
- Device 9A2 has been marked unavailable by the library manager.
- I/O to device 9A3 was unsuccessful (most likely because the device is not connected to the host operating system).
- Device 9A4 is defined as a LIB1 library device, but there is no UCB for device 9A4.
- Device 9A5 is not a valid device type.
- The threshold for SCRATCH1 was set using the LIBRARY THRESHOLD command after IPL. SCRATCH2 and SCRATCH5 use the default threshold that was specified in SYS1.PARMLIB(BTLPRM00) because the LIBRARY THRESHOLD command was not used to 'override' the default for these categories.

RESETACL

Table 16. RESETACL parameter

LIBRARY	RESETACL	UNIT(<i>unit</i>)
---------	----------	---------------------

RESETACL

Unload the Cartridge Loader of a library device. After a RESETACL order has been issued, scratch mounts issued to the target device will require a storage access (robot mount) rather than an ACL feed.

UNIT(*unit*)

Specifies the address of the device to be unloaded.

In this example, the Cartridge Loader of device 123 is to be unloaded.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY RESETACL UNIT(123)
```

RESETDEVICE

Table 17. RESETDEVICE parameter

LIBRARY	RESETDEVICE	UNIT(<i>unit</i>)
---------	-------------	---------------------

RESETDEVICE

Specifies that scratch mounts for the device are to be satisfied with volumes assigned to the system default scratch category.

UNIT(*unit*)

Specifies the address of the device.

In this example, scratch mounts issued to device 123 are to be satisfied with volumes assigned to the default scratch category.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY RESETDEVICE UNIT(123)
```

SETACL

Table 18. SETACL parameter

LIBRARY	SETACL	UNIT(<i>unit</i>)	CATEGORY(<i>category</i>)
---------	--------	---------------------	-----------------------------

SETACL

Load the Cartridge Loader of a library device with cartridges from the category specified by the CATEGORY parameter. If cartridges are loaded in the ACL from another category, they are unloaded before the ACL is loaded with volumes from the new category. The RESETACL command is not required 'between' SETACL commands. The RESETACL command is only required if the ACL is to be unloaded and is to remain unloaded.

Note: All of the cartridges assigned to the category specified in a SETACL command must be consistent with the capabilities of the target device (for example, enhanced capacity cartridges require a 3490E device).

UNIT(*unit*)

Specifies the address of the device to be loaded.

CATEGORY(*category*)

Specifies the category from which cartridges are to be loaded (see "Category names" on page 23).

In this example, the Cartridge Loader of device 123 is to be loaded with volumes from the SCRTCH category.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY SETACL UNIT(123) CATEGORY(SCRTCH)
```

SETCATEGORY

Table 19. SETCATEGORY parameter

LIBRARY	SETCATEGORY	UNIT(<i>unit</i>)	CATEGORY(<i>category</i>)	[VOLSER(<i>volser</i>)]
---------	-------------	---------------------	-----------------------------	---------------------------

SETCATEGORY

Assign a volume to the category specified by the CATEGORY parameter. SETCATEGORY may be abbreviated as SETCAT.

UNIT(*unit*)

Specifies the address used to send the setcategory order to the library.

CATEGORY(*category*)

Specifies the category (see “Category names” on page 23).

VOLSER(*volser*)]VOLSER(*volser-volser*)

Identifies the volume(s) to be assigned to the category. To process a list of volumes, the VOLSER parameter is omitted and the LIBIN data set is used to obtain volume serial numbers.

The VOLSER parameter can be specified using either the alias name VOLUME or the abbreviated name VOL. VOLSER can be used to specify either a single volume or a range of volumes. Use the following rules to specify a range of volume serial numbers:

- Specify six character VOLSERS, separated by a dash (-).
- The first 3 characters of each VOLSER must be the same.
- The last 3 characters of each volume must be numeric.

In the following example:

- Volume SYS001 is assigned to category SCRTCH.
- Volume SYS002 is ejected from the library.
- Volume SYS003 is ejected from the library and the catalog entry for volume SYS003 is deleted (see “Category names” on page 23).

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY SETCAT UNIT(123) VOLSER(SYS001) CATEGORY(SCRTCH)
LIBRARY SETCAT UNIT(123) VOLSER(SYS002) CATEGORY(EJECT)
LIBRARY SETCAT UNIT(123) VOLSER(SYS003) CATEGORY(XEJECT)
```

In this example all of the volumes listed in the LIBIN data set are assigned to category SCRTCH.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBIN DD DSN=RETURN.VOLUMES.TO.SCRTCH
//SYSIN DD *
LIBRARY SETCAT UNIT(123) CATEGORY(SCRTCH)
```

SETCEXIT

Table 20. SETCEXIT parameter

LIBRARY	SETCEXIT	UNIT(<i>unit</i>)
---------	----------	---------------------

SETCEXIT

Indicates that the SETCATEGORY function is to be performed and that the volume and category are to be provided by the IDCLI04 exit routine (see “Appendix B. installation exits” on page 55).

UNIT(*unit*)

Specifies the address used to send the setcategory order to the library.

In this example, the installation exit is invoked by the LIBRARY command and device 123 is used to send set category orders to the library.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY SETCEXIT UNIT(123)
```

SETDEVICE

Table 21. SETDEVICE parameter

LIBRARY	SETDEVICE	UNIT(<i>unit</i>)	CATEGORY(<i>category</i>)
---------	-----------	---------------------	-----------------------------

SETDEVICE

Associate a scratch category with a device. Scratch mounts to the device will request a mount of a volume from the associated category.

UNIT(*unit*)

Specifies the address of the device.

CATEGORY(*category*)

Specifies the category for scratch mounts to the device. (see “Category names” on page 23).

In this example, enhanced capacity cartridges (CST201,CST202 and CST203) are assigned to the SCRATCH4 category (which is assumed to be empty in this example). Any device in the library may be used to send the SETCATEGORY command to the library. The ACL for device 123 is loaded with the three cartridges. The SETDEVICE command will cause scratch mounts to device 123 to request a volume from the SCRATCH4 category. The mounts are satisfied by an ACL feed.

```
//LIBJOB1 JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY SETCATEGORY UNIT(180) CATEGORY(SCRATCH4) VOLSER(CST201)
LIBRARY SETCATEGORY UNIT(180) CATEGORY(SCRATCH4) VOLSER(CST202)
LIBRARY SETCATEGORY UNIT(180) CATEGORY(SCRATCH4) VOLSER(CST203)
LIBRARY SETACL UNIT(180) CATEGORY(SCRATCH4)
LIBRARY SETDEVICE UNIT(180) CATEGORY(SCRATCH4)
```

This example is a continuation of the previous example, in which the ACL was loaded with SCRATCH4 volumes and device 123 was set up to use SCRATCH4 for scratch mounts. LIBJOB2 will ‘temporarily’ set device 123 to use the system default scratch category to satisfy the mount for SYSDD, then restore device 123 to its “normal” scratch category state. Because the ACL for device 123 is loaded with volumes from category SCRATCH4, the mount for SYSDD will require a storage access.

```

//LIBJOB2 JOB
//STEP1 EXEC PGM=IDCAM5
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY RESETEDEVICE UNIT(123)
//STEP2 EXEC PGM=XXXXXX
//SYSPRINT DD SYSOUT=A
//SYSDD DD UNIT=123,DISP=(NEW,KEEP),UNIT=3490,
// LABEL=(1,SL),DSN=NEW.DATASET
//STEP3 EXEC PGM=IDCAM5
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY SETDEVICE UNIT(123) CATEGORY(SCRTCH4)

```

THRESHOLD

Table 22. THRESHOLD parameter

LIBRARY	THRESHOLD	(count) [CATEGORY(category)] [LIBNAME(libname)]
---------	-----------	---

THRESHOLD

Establish a lower limit for the number of scratch volumes. The threshold count applies to a specific scratch category in a specific library. If CATEGORY and LIBNAME are omitted, the default is SCRTCH1 and LIB1. A different threshold can be established for multiple categories in multiple libraries. Valid values for *count* are decimal numbers between 1 and 10,000.

After each scratch mount, BTLS determines the number of volumes remaining in the category that was mounted from. When the number of volumes remaining is less than the threshold for that category, the operator is notified.

The THRESHOLD parameter in BTLPRM00 can also be used to establish a scratch threshold. The threshold specified in parmlib is general in nature, and applies to any category not specified by the THRESHOLD command. The LIBRARY REPORT command should be used to verify the threshold currently in effect for each library device.

CATEGORY(category)

Specifies the category to which the threshold applies.

LIBNAME(libname)

Specifies the library to which the threshold applies.

In this example, a threshold of 100 SCRTCH1 volumes is established for library LIB1. A threshold value of 200 is established for SCRTCH2 volumes in LIB1, and a threshold of 300 is established for SCRTCH3 volumes in LIB1.

```

//LIBJOB JOB
// EXEC PGM=IDCAM5
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY THRESHOLD (100)
LIBRARY THRESHOLD (200) CATEGORY(SCRTCH2)
LIBRARY THRESHOLD (300) CATEGORY(SCRTCH3)

```

After the threshold value is set, it will remain in affect until changed by another THRESHOLD command or until the system is IPL'd.

To establish a general 'default' threshold after each IPL create a member BTLPRM00 in SYS1.PARMLIB. Edit the following parameter into member BTLPRM00:

```
THRESHOLD(100)
```

Category names

The following table lists the category names used by the LIBRARY command. Not all category names are valid with every LIBRARY order. The 'Use' column shows which LIBRARY orders can use each category name as follows:

- I=INVENTORY
- A=SETACL
- S=SETCATEGORY
- D=SETDEVICE
- T=THRESHOLD

The 'LM code' column shows the Library Manager category code.

Table 23. Category names used by the LIBRARY command

Name	Use	LM code	Category Description
INSERT	I	FF00	Volumes received into the library that are not yet assigned to another category.
EJECT	S	FF10	Convenience Station Eject
XEJECT	S	FF10	Same as EJECT. 'X' indicates that, in addition to ejecting the volume from the library, the catalog record for the volume should also be deleted.
EJECTB	S	FF11	Bulk Station Eject
XEJECTB	S	FF11	Same as EJECTB. 'X' indicates that, in addition to ejecting the volume from the library, the catalog record for the volume should also be deleted.
SCRTCH	IASDT	0FFF	Default scratch volume category.
SCRTCH1	IASDT	0FFF	Default scratch volume category (alias name for SCRTCH).
SCRTCH2	IASDT	0FF2	Alternate scratch volume category.
SCRTCH3	IASDT	0FF3	Alternate scratch volume category.
SCRTCH4	IASDT	0FF4	Alternate scratch volume category.
SCRTCH5	IASDT	0FF5	Alternate scratch volume category.
SCRTCH6	IASDT	0FF6	Alternate scratch volume category.
SCRTCH7	IASDT	0FF7	Alternate scratch volume category.
SCRTCH8	IASDT	0FF8	Alternate scratch volume category.
PRIVATE	IS	FFFF	Private volume category.
ERROR	I	F00E	Error Volume category. Volumes are assigned to the error category during demount if the <i>volser</i> specified for demount does not match the external label of the volume being demounted.
CLEANER	I	FFFE	Cleaner volume.
CLEANER2	I	FFFD	3590 Cleaner volume.
SERVICE		FFF9	Service Volume. This category is reported by the COUNTS command, but is not valid with any other LIBRARY command (such as SETACL or INVENTORY).

Table 23. Category names used by the LIBRARY command (continued)

Name	Use	LM code	Category Description
SERVICE2		FFF6	3590 service volume category.
EJECTM	I	FFFA	Manually ejected volume. Volumes in this category still have an entry in the library manager database. The entry can be deleted from the library manager database by specifying the PURGE category in a SETCATEGORY command.
PURGE	S	FFFB	Purge Volume. The PURGE category name is used to remove the library manager database record for a volume that is either manually ejected or misplaced.

Library names

The LIBRARY command can be used to support up to 8 libraries. The LIBNAME parameter is used to identify a library when more than one library is being supported. LIBNAME is not a required parameter when a single library is defined (LIB1 is the default).

The following library names are supported:

- LIB1
- LIB2
- LIB3
- LIB4
- LIB5
- LIB6
- LIB7
- LIB8

Chapter 3. Installation tasks

Install BTLS, following the instructions in the *BTLS Program Directory*. After BTLS has been installed, IPL the system (CLPA) and perform the following tasks.

Authorize the TSO/E LIBRARY command

Authorize the TSO/E LIBRARY command by adding it to IKJTSO00 in SYS1.PARMLIB. After updating IKJTSO00, the command PARMLIB UPDATE(00) will authorize the LIBRARY command. Failure to authorize the LIBRARY command will result in an 047 abend when the command is executed.

Define the LIBRARY command to RACF

If you want to control the use of the new LIBRARY command using RACF, add the following general resource profile:

```
CLASS   ==> PROGRAM
PROFILE ==> IDCLI01
```

Add users or groups to the access list for the profile IDCLI01.

Note: If RACF is not installed or the profile IDCLI01 is not created, the LIBRARY command will execute with no authorization check.

Disable catalog name checking

If you are installing BTLS for z/OS DFSMS Version 1 Release 3 (BTLS FMID HDZ11GS), you may need to add the following command to SYS1.PARMLIB member IEACMD00:

```
MODIFY CATALOG,DISABLE(DSNCHECK)
```

You can also issue the MODIFY CATALOG command from the operators console. It is only necessary to disable catalog data set name checking if you will have volsers that begin with a numeric. If data set name checking is allowed, a BTLS command such as LIBRARY DEFINE VOLSER(100033) will receive the following BTLS error message:

```
BTLS011(REFER TO IDC3009I) CATALOG RETCODE= 144 REASON CODE= 14
```

The error occurs because BTLS generates catalog names such as BTLS.BTLS.VOL.100033. Catalog data set name checking does not allow data sets to be cataloged that contain data set qualifiers that begin with a numeric.

Note: Data set names that do not match the documented syntax restrictions can be cataloged if you disable the catalog data set name syntax checking feature. Utilities such as IDCAMS will not be able to delete these data set names. Unless the program that creates the invalid names has a facility to delete them you may be left with invalid entries in a catalog that cannot be deleted. Disabling the syntax checking for these BTLS data sets names will disable the syntax checking for all cataloged data sets.

Define the BTLS usercatalog

Define a usercatalog named 'BTLS' that will be used by BTLS to define 'BTLS.BTLS.VOL.volser' catalog records. The catalog must be an ICF catalog and may be defined as shared if library volumes are to be shared by more than one host.

```
DEFINE UCAT (NAME(BTLS) MEGABYTES(1 1) ICFCATALOG -  
            VOLUME(COMCAT) SHAREOPTIONS(3 4))
```

BTLS volume records have the same space requirements as non-VSAM datasets (200 bytes per entry). In the example, space for 5000 volumes is required, so the calculation is:

```
5000 volumes X 200 bytes/record = 1 megabyte
```

The following table lists the catalog records used by BTLS:

Table 24. BTLS catalog records

Type	Catalog Record Name	Description
Library	SYS1.BTLS.LIB.LIBn	Defines the device addresses in library n.
Options	SYS1.BTLS.LIB.OPT	Defines the options used by allocation.
Jobname	SYS1.BTLS.JOBn	Defines job names that should use LIBn for scratch allocation.
Volume	BTLS.BTLS.VOL.vvvvvv	Names the library containing volume vvvvvv.

Note: If you use the RACF protect-all option (SETROPTS PROTECTALL), you should create a generic profile for the catalog names that BTLS will use as follows:

```
ADDSD 'BTLS.BTLS.VOL.*' UACC(READ) NOTIFY  
ADDSD 'SYS1.BTLS.*' UACC(READ) NOTIFY
```

You can list BTLS catalog entries by specifying:

```
LISTC ENT(BTLS.BTLS.*) ALL  
LISTC ENT(SYS1.BTLS.*) ALL
```

Attention: Do not create catalog entries with the names 'SYS1.BTLS.*' or 'BTLS.BTLS.*'. These catalog names are used by BTLS and any unexpected entries can caused unpredictable results.

Define library devices to the system

Define library devices to the operating system using either MVSCP or HCD. The following example uses MVSCP to define the 3490 devices in both a 3494 and 3495 library. In the third example, one physical library with 32 devices will be partitioned as 2 logical BTLS libraries (with 16 drives in each library).

```

IODEVICE UNIT=3490,ADDRESS=(180,16)
IODEVICE UNIT=3490,ADDRESS=(190,16)
UNITNAME NAME=3495LIB1,UNIT=((180,16),(190,16))

IODEVICE UNIT=3490,ADDRESS=(1A0,2)
IODEVICE UNIT=3490,ADDRESS=(1B0,2)
UNITNAME NAME=3494LIB2,UNIT=((1A0,2),(1B0,2))

IODEVICE UNIT=3490,ADDRESS=(1C0,16)
IODEVICE UNIT=3490,ADDRESS=(1D0,16)
UNITNAME NAME=3495LIB3,UNIT=((1C0,16))
UNITNAME NAME=3495LIB4,UNIT=((1D0,16))

```

Be sure to code UNITNAME for each library (or for each logical library if you decide to partition library devices). The esoteric name does not need to match the BTLS library name (for example, LIB1,LIB2), but the esoteric group must include the same set of devices defined by the BTLS LIBRARY DEVICES command.

Creation of UNITNAMEs that match the BTLS library devices is done to ensure that allocation recovery messages will only include the appropriate devices. When BTLS is able to exclude an entire group of devices from allocation (the 3494LIB2 group for example), those devices will remain excluded during allocation recovery.

Note: A 3490 control unit in a 3495 can contain up to 16 tape drives. If any of the control units in a 3495 library have less than 16 drives, all 16 possible addresses must still be defined in the host (and to BTLS).

A 3490 control unit in a 3494 library can contain up to two tape drives. If any of the control units in a 3494 library has only one drive, both addresses must still be defined in the host. For a 3494 tape library it is not necessary to define more than two addresses for each control unit.

Note: BTLS support for 4 digit device numbers is provided as follows:

- Support is provided with JDZ11BS.
- For releases prior to JDZ11BS, support is provided by OW12877.
- Library devices must be restricted to the 4 digit address range 0000-0FFF.
- All other devices, including tape drives can use any of the 4 digit addresses in the range 0000-FFFF.
- BTLS commands and messages use only the three significant digits 000-FFF and assume that the fourth digit is always zero.

VM/ESA guest

Note: When BTLS is installed as a VM/ESA® guest on a virtual machine specify the following statement in the virtual machine directory entry to allow BTLS to control a tape library:

```
STDEVOPT LIBRARY CTL
```

Define library devices to BTLS

Define library devices to BTLS using either the TSO LIBRARY DEVICES command:

```
LIBRARY DEVICES (18018F 19019F) LIBNAME(LIB1)
LIBRARY DEVICES (1A01A1 1B01B1) LIBNAME(LIB2)
LIBRARY DEVICES (1B01BF) LIBNAME(LIB3)
LIBRARY DEVICES (1C01CF) LIBNAME(LIB4)
```

or by running a job that executes IDCAMS:

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY DEVICES (18018F 19019F) LIBNAME(LIB1)
LIBRARY DEVICES (1A01A1 1B01B1) LIBNAME(LIB2)
LIBRARY DEVICES (1B01BF) LIBNAME(LIB3)
LIBRARY DEVICES (1C01CF) LIBNAME(LIB4)
```

See Table 8 on page 10 for more information about defining device ranges.

Create SYS1.PARMLIB member BTLPRM00

BTLPRM00 is used to specify parameters that define defaults used by BTLS. Each parameter statement must begin in column 1. Columns that follow a parameter statement are ignored and may be used for comments. The following BTLPRM00 parameter statements are supported:

THRESHOLD(*count*) - Establishes a low threshold value for scratch volumes. When the number of scratch volumes falls below the *count* the operator receives an attention message.

The threshold value established at IPL by the THRESHOLD parameter is replaced when the LIBRARY THRESHOLD command is executed. If more than one threshold value is required, either to support multiple libraries or multiple scratch categories, use the LIBRARY THRESHOLD command after IPL. The LIBRARY REPORT command can be used to display the threshold value(s) that have been established.

SCRATCH n - The purpose of the BTLPRM00 *SCRATCH n* parameter is to override the default category used to satisfy scratch mounts. Unless specified, scratch mounts use volumes assigned to the SCRATCH1 library category (category code '0FFF'X).

When more than one host share a library, a different scratch category can be used by each host. The BTLPRM00 parmlib member for each host names the scratch category that host will use for scratch mounts.

AUTODEMOUNT - Indicates that library volumes should be automatically demounted if they become mounted on UNALLOCATED devices. When AUTODEMOUNT is specified and BTLS detects a mount completion for an UNALLOCATED device, the volume will be unloaded and demounted.

In a BTLS library, a volume can become mounted on an unallocated device when a job is cancelled or abends while *mount pending*. Because the mount is not complete before the job terminates, a demount is not sent to the library. Even

though the job is terminated, the library mount will eventually complete in the library. If the device has not yet been allocated to another job, the volume will stay mounted.

The purpose of AUTODEMOUNT is to solve the following two problems created by volumes mounted on unallocated drives:

1. If another job allocates the drive and needs a private volume mounted, the job will demount(*keep*) the previously mounted volume. The demount will cause a scratch volume to be assigned to the private category even though it was never used.
2. If another job allocates a different tape drive and needs a volume that is already mounted on an unallocated drive, the mount will fail with ERA=64 (volume in use).

LIBAFFINITY - indicates that BTLS should 'break' affinity when an invalid UNIT=AFF condition is detected. If LIBAFFINITY is not used, invalid affinity is reported by message BTLS104I and the job is terminated.

In order to validate affinity, BTLS compares the allocation requirements of the target DD(DD1) and the UNIT=AFF DD(DD2). The following conditions are valid:

- Both DD1 and DD2 require drives in the same library.
- Both DD1 and DD2 require non-library drives.
- Either DD1 or DD2 can use **any** drive. BTLS allows **any** drive when option 'I' is used to control scratch allocation and for any SCRATCH request that specifies UNIT=AFF.

When an invalid condition is detected, and the LIBAFFINITY option is in effect, BTLS breaks the invalid affinity. The following example shows how BTLS will break affinity.

```
//DD1 DD VOL=SER=VOL001,UNIT=TAPE
// DD VOL=SER=VOL002,UNIT=AFF=DD1
// DD VOL=SER=VOL003,UNIT=AFF=DD1
// DD VOL=SER=VOL004,UNIT=AFF=DD1
```

NOTE: VOL001 and VOL004 are defined to BTLS as LIB1
VOL002 and VOL003 are not defined to BTLS

When the above JCL is executed, BTLS directs the allocation for DD1 into LIB1, but will detect an error because VOL002 is not in LIB1 (yet specifies affinity with DD1). When the LIBAFFINITY option is in effect, BTLS causes the JCL to allocate as if it were written as follows:

```
//DD1 DD VOL=SER=VOL001,UNIT=TAPE
//DD2 DD VOL=SER=VOL002,UNIT=TAPE
// DD VOL=SER=VOL003,UNIT=AFF=DD2
// DD VOL=SER=VOL004,UNIT=AFF=DD1
```

In order for LIBAFFINITY to successfully break affinity, the set of devices determined by the UNIT parameter of the target DD must include devices that will also satisfy the requirements of the 'broken' DD.

If the example JCL was coded as follows, the allocation for VOL002 would fail because UNIT=LIB1DEV5 names an esoteric that does not include any devices in LIB2 (and VOL002 is defined to BTLS as a LIB2 volume).

```
//DD1 DD VOL=SER=VOL001,UNIT=LIB1DEVS
// DD VOL=SER=VOL002,UNIT=AFF=LIB1
// DD VOL=SER=VOL003,UNIT=AFF=LIB1
// DD VOL=SER=VOL004,UNIT=AFF=LIB1
```

Note: LIBAFFINITY is not supported when MVS/SP 5.2 is installed.

EXPDT98000 | EXPD - The EXPDT98000 option allows a duplicate of a BTLS library volume to be mounted on a drive outside the library.

When the EXPDT98000 option is used, and a DD statement includes EXPDT=98000, BTLS will not validate or interfere with the allocation. This allows you to allocate a drive outside the library for a volser that is defined to BTLS as a library volume.

The following statements are examples of valid BTLPRM00 records:

```
/******
/* UNRECOGNIZED DATA IN COLUMN 1 IS IGNORED, SO THIS COMMENT IS OK */
/******
THRESHOLD(50) /* set minimum threshold for scratch */
AUTODEMOUNT /* demount unallocated drives */
LIBAFFINITY /* break invalid library affinity */
```

Install the BTLS allocation interface

For releases prior to MVS/SP 5.1 ensure that APAR OY63009 is installed (OY63009 is included with MVS/SP 5.1). OY63009 provides the interface used by BTLS to control tape allocations.

OY63009 is not used with MVS/SP 5.2. Instead, BTLS uses the tape allocation subsystem interface. When MVS/SP 5.2 is installed, add the following command to SYS1.PARMLIB member IEACMD00:

```
SETSSI ADD,SUBNAME=BTLS,INITRTN=AOMALSSI
```

You can also issue the SETSSI command from the operators console. The SETSSI command activates the BTLS Tape Allocation SSI so that BTLS can begin to control tape allocations. When the command executes, the following messages should be received at the operators console:

```
BTLS401I START OF BTLS INITIALIZATION
BTLS402I BTLS INITIALIZATION COMPLETE
```

Note: To ensure that BTLS allocation is properly installed, use the trace option 'T' (see Table 14 on page 16). If BTLS trace data is not produced for tape allocations, this indicates that the BTLS allocation module is not being invoked. The BTLS allocation module is AOMAB433 (AOMALLOC for MVS/SP 5.2).

Insert volumes into the IBM 3494 and 3495

When volumes are entered into the library they are assigned to the INSERT category by the 3494/3495 Library Manager. Use the LIBRARY INVENTORY command to obtain a list of the volumes in the INSERT category. SYSPRINT will display the number of volumes and the LIBOUT dataset will contain a list of the volume serial numbers. The LIBOUT dataset can be used as input to other LIBRARY command operations.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBOUT DD DSN=VOLSER.LIST,
// DD DISP=(NEW,KEEP),VOL=SER=VOL001,UNIT=3390,
// DD DCB=(LRECL=80,BLKSIZE=800,RECFM=FB)
//SYSIN DD *
LIBRARY INVENTORY UNIT(180) CATEGORY(INSERT)
```

Assign volumes to SCRATCH or PRIVATE category

Determine which volumes should be private and which should be scratch, then use the LIBRARY SETCATEGORY command to assign each volume to the appropriate category. In this example, all of the volumes in the LIBIN data set are assigned to the scratch category.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBIN DD DSN=VOLSER.LIST
//SYSIN DD *
LIBRARY SETCATEGORY UNIT(180) CATEGORY(SCRATCH)
```

Create BTLS volume catalog records

Create BTLS volume catalog records using the LIBRARY DEFINE command. For specific volume requests, BTLS allocation uses BTLS volume records to control allocation. If a BTLS volume record is found, BTLS will direct allocation into the library that was named by the LIBRARY DEFINE command. If a BTLS volume record is not found, then BTLS will direct allocation to a non-library device.

In this example, all of the volumes in the LIBIN data set are cataloged as residing in library LIB1. LISTVOL will produce a SYSPRINT listing of the cataloged volumes. In the example the LIBOUT will not be used, so is specified as DUMMY.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//LIBIN DD DSN=VOLSER.LIST
//LIBOUT DD DUMMY,DCB=(LRECL=80,RECFM=FB)
//SYSIN DD *
LIBRARY DEFINE LIBNAME(LIB1)
LIBRARY LISTVOL LIBNAME(LIB1)
```

Note: In the example, LIBNAME(LIB1) is optional since LIB1 is the default when LIBNAME is omitted.

Initialize volumes using IEHINITT

Use IEHINITT to label any cartridges that require volume labels:

```
//LABELJOB JOB
//LABEL EXEC PGM=IEHINITT
//SYSPRINT DD SYSOUT=*
//DD1 DD UNIT=(xxxx,,DEFER)
//SYSIN DD *
DD1 INITT SER=001901
DD1 INITT SER=001902
DD1 INITT SER=001903
DD1 INITT SER=001904
DD1 INITT SER=001905
```

For xxxx specify 3480 for 3480 cartridges, 3490 for 3490 cartridges, and 3590-1 for 3590 cartridges.

Reply 'M' to console message IEC701D for each volume (or automate the response). The LIBRARY SETCATEGORY command should be used to assign the volumes to the appropriate category for use.

Define the BTLS options

Define the BTLS option characters using the LIBRARY OPTIONS command. The characters JEE indicate that scratch allocations should be based on JOBNAME and that BTLS allocation and DDR support should be enabled.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY OPTIONS (JEE)
```

Control SCRATCH allocation

You must decide how scratch allocations are to be controlled. If you have 3490 drives inside a library and 3490 drives outside a library this difference must be considered during allocation. When a specific volume is required, the decision is simple for BTLS. If there is a BTLS volume record in the catalog, BTLS directs allocation to the library named in the volume record. If there is no BTLS volume record in the catalog, BTLS directs allocation to tape drives outside the library.

For scratch requests, you must tell BTLS when to allocate inside the library and when to allocate outside the library. The first of the 3 BTLS option characters (see Table 14 on page 16) tells BTLS how to manage scratch allocations.

If you have decided to route scratch allocations into the library based on JOBNAME, you must identify the jobs to BTLS. In the following example the jobname TAPELIB1 will use LIB1 for scratch allocation, as well as any jobname that begins with the name AUTO or HSM. All other jobs will be allocated away from LIB1.

```
//LIBJOB JOB
// EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
LIBRARY JOBNAMES ( TAPELIB1 AUTO HSM ) LIBNAME(LIB1)
```


Be aware that once a scratch allocation has been made, and the tape dataset has been created and cataloged, the next reference to that dataset will be a specific request for the volume. As previously stated, the specific allocation for the volume will be determined by the BTLS volume catalog records.

Chapter 4. Messages and codes

This chapter contains messages you can receive while using the Basic Tape Library Support (BTLS). They are grouped as follows:

Section	Page
Allocation messages	35
LIBRARY command messages	36
IBM 3494 and 3495 error messages	39
Dynamic device reconfiguration (DDR) messages	41
Tape allocation SSI initialization	41
Tape allocation SSI	42
BTLS abend codes	43

For any system messages you receive, see the respective messages publication listed in “Referenced publications” on page xi. Each of these publications contain the messages for the respective operating system.

Allocation messages

BTLS101I ALLOCATION ASSIST INSTALLED AND NO LIBRARY ENTRY FOUND. WILL CAUSE IEF245I MESSAGE.

Explanation: The LIBRARY OPTIONS command specified enable ('E') as the allocation option, and no library devices have been defined to BTLS.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: Either disable BTLS allocation using the LIBRARY OPTIONS command, or define library devices using the LIBRARY DEVICES command.

BTLS102I ALLOCATION ASSIST, VOL/JOB/LIB AFFINITY ENTRY IN CATALOG - NO LIB ENTRY FOUND. WILL CAUSE IEF245I MESSAGE.

Explanation: The volume required for allocation is defined to BTLS as a library volume residing in library 'LIBn'. BTLS allocation cannot locate the LIBRARY DEVICES catalog record for library 'LIBn'.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: Either delete the volume from 'LIBn' using the LIBRARY DELETE command, or define library 'LIBn' using the LIBRARY DEVICES command.

BTLS103I ALLOCATION ASSIST, NO ELIGIBLE DEVICES. WILL CAUSE IEF245I MESSAGE.

Explanation: In attempting to direct allocation into a library (or away from all libraries), BTLS has excluded all of the eligible devices.

For example, the following conditions will create this error:

```
UNITNAME  NAME=3494LIB,UNIT=((1A0,2))
LIBRARY    DEVICES (1A01A1) LIBNAME(LIB1)
.
LIBRARY    SETCATEGORY VOLSER(T12345) -
           UNIT(1A0)   CATEGORY(EJECTX)
.
.
//TESTDD DD UNIT=3494LIB,VOL=SER=T12345
```

In the example, T12345 had been in the 3494 library and was defined to BTLS as a LIB1 tape. However, at some point T12345 was ejected from the library using EJECTX (which deleted the BTLS catalog record for T12345).

During allocation for TESTDD, the only eligible devices are 1A0 and 1A1. Because there is no BTLS volume record for T12345, BTLS assumes that it requires a tape drive outside the library and excludes devices 1A0 and 1A1 from allocation.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: If T12345 is in the

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library, use the LIBRARY DEFINE command to define the volume to BTLS. If T12345 is *not* in the library, change the UNIT= esoteric name to one that contains manual tape drives.

In the example, T12345 could have been ejected using the EJECT category, which does not delete the BTLS catalog record. Then the allocation would succeed, and the mount will fail with message 'T12345,VOLSER NOT IN LIBRARY'. The mount failure message allows the operator to enter the volume into the library and then redrive the mount.

BTLS104I UNIT AFFINITY NOT ALLOWED FOR VOLUMES IN AND OUT OF THE LIBRARY. WILL CAUSE IEF245I MESSAGE.

Explanation: The source and target of UNIT=AFF must satisfy the following requirement. Either both volumes must reside in the same library, or both volumes must reside outside of any library.

In order to validate affinity, BTLS compares the allocation requirements of the target DD(DD1) and the UNIT=AFF DD(DD2). The following conditions are valid:

- Both DD1 and DD2 require a drive in the same library.
- Both DD1 and DD2 require a non-library drive.
- Either DD1 or DD2 can use **any** drive. BTLS allows **any** drive when option 'I' is used to control scratch allocation.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: If both volumes are in the same library, ensure that they are both properly defined to BTLS (use the LIBRARY DEFINE command). If both volumes are to be manually mounted, ensure that neither is defined to BTLS (use the LIBRARY DELETE command).

System Programmer Response: Optionally, consider using the LIBAFFINITY option described in "Library names" on page 24.

LIBRARY command messages

BTLS000I ERA=xx,msgtext

Explanation: A Tape Library I/O error occurred. In the message 'xx' is the Error Recovery Action code (ERA) returned in sense byte 3. The following errors are reported with message BTLS001I:

BTLS105I ALLOCATION ASSIST ERROR WHILE PROCESSING DDNAME: ddname

Explanation: This message identifies the DD statement that caused a BTLS allocation error message to be issued.

BTLS106I ALLOCATION ASSIST INVALID OPTION SPECIFIED. WILL CAUSE IEF245I MESSAGE.

Explanation: The SYS1.BTLS.LIB.OPT contains an invalid allocation option value. The first character of the options must be A,I,J or M.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: Redefine the BTLS options using the LIBRARY OPTIONS command.

BTLS107I CATALOG SEARCH FOR: BTLS.BTLS.VOL.VVVVVV, FAILED WITH RETURN CODE= xx

Explanation: An unexpected return code was received while searching the catalog for a BTLS volume record. The expected return codes are 0 and 8, which indicate either that the volume record was found or that it was not found. An example of an unexpected return code is 36, which indicates that the volume containing the user catalog is unavailable.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: Refer to message IDC3009I to interpret the return code. Attempt to list the catalog record using the following command:

```
LISTC ENTRY('BTLS.BTLS.VOL.VVVVVV') ALL
```

```
BTLS000I ERA=60,ATTACHMENT INTERFACE EQUIPMENT CHECK
BTLS000I ERA=62,LIBRARY MANAGER OFFLINE TO SUBSYSTEM
BTLS000I ERA=63,LIBRARY MANAGER & 3490 INCOMPATIBLE
BTLS000I ERA=64,vvvvvv,VOLUME IN USE
BTLS000I ERA=66,vvvvvv,VOLSER NOT IN LIBRARY
BTLS000I ERA=67,CATEGORY EMPTY
BTLS000I ERA=68,SEQUENCE CHECK
BTLS000I ERA=6B,vvvvvv,LIBRARY VOLUME MISPLACED
BTLS000I ERA=6D,LIBRARY DRIVE NOT UNLOADED
BTLS000I ERA=6F,VISION FAILURE
BTLS000I ERA=72,LIBRARY NOT CAPABLE - MANUAL MODE
BTLS000I ERA=75,vvvvvv,VOLUME INACCESSIBLE
BTLS000I ERA=7B,vvvvvv,VOLUME MANUALLY EJECTED
BTLS000I ERA=7F,LIBRARY CATEGORY IN USE
```

Problem Determination: See “Chapter 5. Error recovery procedures” on page 45 and Table 25 on page 46.

BTLS001I I/O TO DEVICE *ddd* FAILED WITH IOSCOD= *ioscod*

Explanation: This error message is issued when I/O to a library device has failed. In the message '*ddd*' is the device address and '*ioscod*' is the I/O completion code from the IOSB control block.

Problem Determination: IOSCOD=41 indicates that the I/O operation encountered a permanent hardware error. Additional values for IOSCOD can be found in macro IECDIOSB.

BTLS002I SENSE= *sense bytes*

Explanation: This error message is issued when IBM 3494 and 3495 I/O fails due to a unit check.

BTLS006I UNABLE TO FIND UCB FOR *ddd*

Explanation: The UCB for the device address specified in the UNIT(*ddd*) parameter cannot be found.

System Action: The LIBRARY command is terminated with condition code 12.

System Programmer Response: Probably an incorrect device number was specified on the UNIT(*ddd*) parameter. Correct the device number and re-issue the command.

BTLS007I ERROR READING FROM LIBIN

Explanation: This error message is issued when IDCAMS indicates that a read from LIBIN failed. Existing IDCAMS messages will explain the nature of the failure.

Message BTLS007I is also issued when the first character in a LIBIN record is blank.

System Action: The LIBRARY command is terminated with condition code 12.

BTLS008I LIBIN VOLSER(*volser*)

Explanation: This informational message is issued for each volume serial read from the LIBIN data set. This message provides a SYSOUT list of the volumes affected by SETCATEGORY.

BTLS009I UNDEFINED CATEGORY SPECIFIED

Explanation: this error message is issued when a CATEGORY(*name*) is not one of the supported category names.

System Action: The LIBRARY command is terminated with condition code 12.

System Programmer Response: See “Category names” on page 23 for a list of the valid category names. To support migration the category names SMSPRIV,SMSMED1 and SMSMED2 are also supported.

BTLS010I USER EXIT VOLSER(*volser*) CATEGORY(*category*)

Explanation: This informational message is issued by the SETCEXIT routine for each return from the user exit. If the setcategory operation is successful no additional message is issued. If the setcategory operation fails an error message is issued.

BTLS011I (REFER TO IDC3009I) CATALOG RETCODE= *xx* REASON CODE= *xx*

Explanation: This error message is issued when a catalog DEFINE or DELETE operation fails. Message IDC3009I documents the return and reason codes.

BTLS013I ENTRY(*catalog.dataset.name*) DELETED FROM CATALOG

Explanation: This message is issued when a catalog delete operation completes. If the operation fails the message will indicate 'NOT DELETED' and message BTLS011I will also be issued.

BTLS014I ENTRY(*catalog.dataset.name*) DEFINED IN CATALOG

Explanation: This message is issued when a catalog define operation completes. If the operation fails the message will indicate 'NOT DEFINED' and message BTLS011I will also be issued.

BTLS015I ENTRY(*catalog.dataset.name*) NOT LOCATED IN CATALOG

Explanation: This message is issued when a catalog locate operation fails to locate an expected catalog record.

System Action: The LIBRARY command is terminated with return code 12.

System Programmer Response: Review additional BTLS messages to determine the cause of the error.

BTLS016I LIBRARY UNIT MISSING OR INVALID

Explanation: A LIBRARY command does not include the UNIT parameter, and it is required.

System Action: The LIBRARY command is terminated with return code 12.

System Programmer Response: Include the UNIT(*ddd*) parameter and resubmit the command.

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BTLS017I INVENTORY CONTAINS WARNING OR INFORMATIONAL DATA

Explanation: This message is issued when an INVENTORY operation is performed and one or more of the volume records in the inventory list contains any of the following:

VOLUME INACCESSIBLE
VOLUME MOUNTED
VOLUME PENDING EJECT
VOLUME BEING EJECTED
VOLUME IS MISPLACED
VOLUME HAS AN UNREADABLE LABEL
VOLUME WAS USED DURING MANUAL MODE
VOLUME WAS MANUALLY EJECTED

System Action: The LIBRARY INVENTORY command executes to completion, but set return code 4 at termination.

System Programmer Response: Search the LIBOUT volume list for the word 'VOLUME', to find the volume records in error.

BTLS018I NUMBER OF VOLUMES IN CATEGORY IS: nnn

Explanation: Informational message issued when an INVENTORY operation is performed.

BTLS019I NUMBER OF VOLUMES IN CATEGORY (catname)= nnnn

Explanation: Informational message issued when a COUNTS operation is performed.

BTLS021I OPERATION COULD NOT BE STARTED

Explanation: This message is issued when a LIBRARY MOUNT or LIBRARY DEMOUNT order cannot be started. The LIBRARY command uses Message Display to send a mount or demount request to the library. If the request cannot be started, an error message is sent to the operators console by message display, and message BTLS021I is issued by the LIBRARY command.

System Action: The LIBRARY command is terminated with return code 12.

Problem Determination: Review BTLS messages sent to the operators console to determine the reason for the failure.

BTLS022I INVALID OPTION SPECIFIED

Explanation: An unsupported option character was specified on the LIBRARY OPTIONS command. Table 14 on page 16 lists the supported options.

System Action: The LIBRARY OPTIONS command is terminated with return code 12.

BTLS023I INVALID LIBRARY NAME

Explanation: The supported library names are LIB1,LIB2,LIB3,LIB4,LIB5,LIB6, LIB7, and LIB8.

System Action: The LIBRARY command is terminated with return code 12.

BTLS024I INVALID VOLSER

Explanation: A VOLSER was specified with a blank as the first character.

System Action: The LIBRARY command is terminated with return code 12.

BTLS025I TOO MANY PARAMETERS SPECIFIED

Explanation: For the LIBRARY DELETE command, both the LIBNAME and VOLSER parameter were specified. Only one parameter(LIBNAME or VOLSER) is allowed for LIBRARY DELETE.

System Action: The LIBRARY DELETE command is terminated with return code 12.

BTLS026I INVALID DEVICE TYPE FOR ddd

Explanation: Unit control block (UCB) for device *ddd* is an invalid device type. UCBs for library devices supported by BTLS must be defined to the system as either 3480, 3490, or 3590.

System Action: The LIBRARY command is terminated with return code 12.

BTLS027I INVALID CHARACTERS IN JOBNAME: jobname

Explanation: One of the jobnames specified by the LIBRARY JOBNAMES command contains an invalid character. The invalid character(s) will be displayed as periods ('.'). For example, the jobname MY&&JOB will display as MY..JOB. The valid characters for jobnames are the numbers 0-9, the uppercase alphabetic characters, and the national characters \$,# and @. Message BTLS027I is also received if a jobname contains a numeric (0-9) as the first character.

System Action: The LIBRARY JOBNAMES command is terminated with return code 12.

System Programmer Response: Correct the invalid jobname and re-issue the command.

BTLS031I RACF RETURN CODE= xx

Explanation: IDCLI01 is defined as a RACF profile, but the user is not authorized to use IDCLI01. The return code from RACF is displayed:

- 08 - IDCLI01 profile defined but user not authorized.

System Action: The LIBRARY command is terminated with return code 12.

System Programmer Response: See “Chapter 3. Installation tasks” on page 25 for a description of the BTLS RACF requirements.

BTLS032I BTLS IS DISABLED

Explanation: BTLS has been disabled by the installation of OW03323, OW17868, OW18860, or OW28259.

BTLS040I AUDIT, *vvvvvv*, *error text*

Explanation: A LIBRARY AUDIT for volume *vvvvvv* failed for the reason indicated by *error text*. Possible *error text* for audit failure are:

VOLSER NOT READABLE
 VOLUME INACCESSIBLE
 VOLUME MISPLACED
 MANUALLY EJECTED
 NOT IN LIBRARY

System Action: The LIBRARY AUDIT command will continue with the next LIBIN volume, but will set return code 4 when all audits have completed.

BTLS041I AUDIT ALREADY IN PROGRESS

Explanation: Only one audit at a time is allowed from each host and a previous audit has not yet completed.

System Action: The LIBRARY AUDIT command is terminated with return code 8.

System Programmer Response: Wait until the previous audit completes, then resubmit the new audit request. If there is no previous audit in progress, then a prior audit may have abnormally ended. In this case the BTLS041I message is erroneous, so specify the FORCE keyword on the LIBRARY AUDIT command.

BTLS046I AUDIT, *vvvvvv*, FAILED

Explanation: A LIBRARY AUDIT for volume *vvvvvv* failed for an indeterminate reason.

The audit was performed by the library manager and the audit completion code indicated a failure other than the failures reported by message BTLS040I.

System Action: The LIBRARY AUDIT command will continue with the next LIBIN volume, but will set return code 4 when all audits have completed.

IBM 3494 and 3495 error messages

BTLS [*](ERA|COD|MSG=*xx,llll*) [*volser,*] **error description**

BTLS [*](ERA|COD|MSG=*xx,o,ddd*) [*volser,*] **error description**

Explanation: This message is issued to report either a mount or demount error, or to report an asynchronous

System Programmer Response: Report the failure to you service representative.

BTLS049I AUDIT, *vvvvvv*, SUCCESSFUL

Explanation: Informational message. The AUDIT for volume *vvvvvv* completed successfully.

BTLS050I DEVICETYPE MUST BE 3490, 3490E, or 3590

Explanation: The supported device types for LIBRARY MIGRATION are 3490, 3490E, and 3590.

System Action: The LIBRARY MIGRATE command is terminated with return code 12.

System Programmer Response: Probably an incorrect device number was specified on the UNIT(*ddd*) parameter. Correct the device number and re-issue the command.

BTLS051I NUMBER OF VOLUMES PROCESSED IS: *nnn*

Explanation: Informational message. Displays the number *nnn* of volumes processed by a LIBRARY MIGRATE command.

BTLS052I VOLUME *vvvvvv* IS NOT MANUALLY EJECTED OR MISPLACED

Explanation: The SETCATEGORY CATEGORY(PURGE) VOLSER(*vvvvvv*) command was issued and volume *vvvvvv* is not in either the MANUALLY EJECTED category or the MISPLACED category. Only volumes in the MANUALLY EJECTED or MISPLACED category can be purged.

BTLS053I *libname* IS NOT DEFINED

Explanation: The catalog record for SYS1.BTLS.LIB cannot be located.

System Action: The LIBRARY REPORT command is terminated.

System Programmer Response: Define the SYS1.BTLS.LIB.*libname* catalog record by executing the LIBRARY DEVICES command

error reported by the library. Asynchronous errors are displayed with the message number 'BTLS*' (where the '*' indicates that the error was asynchronous).

A successful mount or demount order occurs as follows. The order is issued to the library by the host and is accepted. When the library completes the order, an asynchronous completion message is returned to the host from the library. The completion message contains

Messages

status indicating that the order was successful.

A mount or demount order can fail in two ways:

- The order may fail initially, before being accepted by the library. These failures are reported to the host with a unit check and sense data. Unit check failures are reported to the operator using message number 'BTLS'.
- The order may be accepted by the library, then fail when the library attempts to execute the order. These failures are reported to the host with an asynchronous completion message. Asynchronous message failures are reported to the operator using message number 'BTLS*'.

In addition to mount or demount failures, other library events are reported to the host as asynchronous messages. These library events are also reported to the operator using message number 'BTLS*'.

Message contents:

- * indicates that a library order was accepted by the IBM 3494 and 3495, and subsequently failed, or that an event was reported that is not related to a particular library order.

ERA=xx

'xx' displays the Error Recovery Action code contained in byte 3 of sense data. Table 25 on page 46 lists mount and demount errors reported by MSG=xx.

COD=xx

'xx' is the condition code contained in a mount or demount completion message. Table 25 on page 46 lists mount and demount errors reported by COD=xx.

MSG=xx

'xx' is a BTLS code that identifies the reason for the message. Table 25 on page 46 lists conditions reported by MSG=xx.

- o The order that failed ('M' for mount, 'D' for demount). The order is displayed as '**' when it is not relevant to the error being reported.

ddd

The device for the mount or demount. The device is displayed as '****' when it is not relevant to the error being reported.

- //// The library serial number is used to report an error that is not related to a mount or demount. For example: BTLS*(ERA=73,F4123) LIBRARY INTERVENTION REQUIRED.

volser

The volume serial being mounted or demounted. A *volser* is not displayed when it is not relevant to the error being reported.

error description

Describes the error.

Module: Messages 'BTLS' are issued by module IGX00030 (message display).

Module: Messages 'BTLS*' are issued by module AOMBTTNT (tape attention).

Problem Determination: Refer to "Chapter 5. Error recovery procedures" on page 45 and to Table 25 on page 46.

BTLS *(TAPE-LIB-MSG) message text received from the library operator

Explanation: This message is issued to the system operator's console when the library operator has issued a message to the host from the library manager's console. This is NOT an error message.

BTLS202I SCRTCH VOLUMES BELOW THRESHOLD....COUNT=nnn

Explanation: The number of scratch volumes in the library has dropped below the threshold limit established with the BTLPRM00 THRESHOLD parameter. COUNT 'nnn' is the number of scratch volumes remaining in the library.

BTLS202I LIBx(SCRTCHx) BELOW THRESHOLD....COUNT=nnn

Explanation: The number of scratch volumes in the library has dropped below the threshold limit established with the LIBRARY THRESHOLD command. *LIBx* is the LIBNAME that was specified on the THRESHOLD command. *SCRTCHx* is the CATEGORY that was specified on the THRESHOLD command. COUNT 'nnn' is the number of scratch volumes remaining in the library.

BTLS203I REPLY 'Y' TO RETRY, 'N' TO QUIT

Explanation: Allows the operator to determine if a failing Mount or Demount should be retried. This message is issued following the message that reports the failure, as shown in the following example:

In the following example, the operator can reply 'N' to cancel the mount to device 283, or the operator can correct the 'out of scrtch' condition then reply 'Y'.

```
BTLS (ERA=67,M,283) SCRTCH CATEGORY EMPTY
BTLS203I: REPLY 'Y' TO RETRY, 'N' TO QUIT
```

Note: If the reply to message BTLS203I is 'N', the job that requested the mount must be cancelled.

Dynamic device reconfiguration (DDR) messages

BTLS301I SWAP *xxx*(LIB=[*libname*|NONE]), TO
yyy(LIB=[*libname*|NONE]),
[ALLOWED|REJECTED]

Explanation: This message is only issued when the DDR trace OPTION is used. Message BTLS301I is issued for each device that is considered for a swap.

xxx

Device being swapped from.

libname

Library name if device is in a library ('NONE' is displayed for non-library devices).

yyy

Device being swapped to.

ALLOWED

The two devices are compatible and the swap is allowed.

REJECTED

The two devices are incompatible and the swap is not allowed.

BTLS302I CATALOG ERROR

Explanation: A catalog error occurred while trying to read library catalog records.

BTLS303I NO (SYS1.BTLS.LIB.LIB*) CATALOG
ENTRIES FOUND

Explanation: No library definition catalog records were found. The library DDR support cannot ensure that an appropriate device is swapped to.

BTLS304I DDR ASSIST DISABLED BY
INSTALLATION OPTION

Explanation: The OPTION catalog record indicates that the library DDR support should not influence device selection. Library DDR support cannot ensure that an appropriate device is swapped.

Tape allocation SSI initialization

The following messages are issued by module AOMALSSI during initialization of the BTLS Tape Allocation SSI.

BTLS401I START OF BTLS INITIALIZATION

Explanation: This message is issued as a result of the command:

```
SETSSI ADD,SUBNAME=BTLS,INITRTN=AOMALSSI.
```

BTLS402I BTLS INITIALIZATION COMPLETE

Explanation: This message indicates that module AOMALSSI has successfully completed initialization.

System Action: BTLS tape allocation module AOMALLOC has been activated. Depending on the BTLS options, AOMALLOC may begin to direct tape allocations either into or away from the tape library.

BTLS403I IEFSSVT CREATE FAILED, RC=*xx*

Explanation: This message indicates that module AOMALSSI was unable to create the BTLS subsystem vector table. Message BTLS405I will be issued to display the reason code from IEFSSVT.

System Programmer Response: See the return and reason code explanation in macro IEFJSRC for problem determination.

BTLS404I IEFSSI ACTIVATE FAILED, RC=*xx*

Explanation: This message indicates that module AOMALSSI was unable to activate the BTLS subsystem. Message BTLS405I will be issued to display the reason code from IEFSSI.

System Programmer Response: See the return and reason code explanation in macro IEFJSRC for problem determination.

BTLS405I REASON CODE= *XXXX*

Explanation: Displays the reason code from BTLS subsystem initialization failures.

System Programmer Response: Refer to the return and reason codes in macro IEFJSRC for problem determination.

BTLS406I SUBSYSTEM INITIALIZATION FAILED

Explanation: This message indicates that the BTLS Tape Allocation SSI is not available. BTLS tape allocation control module AOMALLOC will not be able to control allocations into and away from the library(s).

System Action: BTLS allocation module AOMALLOC has not been activated. Allocations to tape may take

Messages

place, but without any influence from BTLS.

BTLS407I LOAD FAILED FOR MODULE AOMALLOC

Explanation: BTLS initialization module AOMALSSI was unable to load the BTLS tape allocation function module AOMALLOC.

System Programmer Response: Ensure that module AOMALLOC is available in LPALIB.

Tape allocation SSI

The following messages are issued by the BTLS Tape Allocation module AOMALLOC.

BTLS501I ALLOCATION OPTION IS ENABLED AND NO LIBRARY DEVICES ARE DEFINED.

Explanation: The LIBRARY OPTIONS command specified enable('E') as the allocation option, and no library devices have been defined to BTLS.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: Either disable BTLS allocation using the LIBRARY OPTIONS command, or define library devices using the LIBRARY DEVICES command.

In the example, the only devices eligible for allocation for TESTDD are 1A0 and 1A1. Because there is no BTLS volume record for T12345, BTLS assumes that it requires a tape drive outside the library and excludes devices 1A0 and 1A1 from allocation.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: If T12345 is in the library, use the LIBRARY DEFINE command to define the volume to BTLS. If T12345 is *not* in the library, change the UNIT= esoteric name to one that contains manual tape drives.

BTLS502I LIBRARY DEVICES NOT DEFINED FOR LIBRARY: LIBn

Explanation: The volume required for allocation is defined to BTLS as a library volume residing in library 'LIBn'. BTLS allocation cannot locate the LIBRARY DEVICES catalog record for library 'LIBn'.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: Either delete the volume from 'LIBn' using the LIBRARY DELETE command, or define library 'LIBn' using the LIBRARY DEVICES command.

BTLS504I AFFINITY FAILURE, VOLUMES MUST BE IN THE SAME LIBRARY OR NO LIBRARY

Explanation: The source and target of UNIT=AFF must satisfy the following requirement. Either both volumes must reside in the same library, or both volumes must reside outside of any library.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: If both volumes are in the same library, ensure that they are both properly defined to BTLS (use the LIBRARY DEFINE command). If both volumes are to be manually mounted, ensure that neither is defined to BTLS (use the LIBRARY DELETE command).

BTLS503I THERE ARE NO DEVICES ELIGIBLE FOR ALLOCATION

Explanation: In attempting to direct allocation into a library (or away from all libraries), BTLS has excluded all of the eligible devices.

For example, the following conditions will create this error:

```
UNITNAME NAME=3494LIB,UNIT=((1A0,2))
LIBRARY  DEVICES (1A01A1) LIBNAME(LIB1)
LIBRARY  DELETE VOLSER(T12345)
.
.
//TESTDD DD UNIT=3495LIB,VOL=SER=T12345
```

BTLS505I BTLS ALLOCATION ERROR WHILE PROCESSING DDNAME: ddname

Explanation: This message identifies the DD statement that caused a BTLS allocation error message to be issued.

BTLS506I INVALID BTLS ALLOCATION OPTION (MUST BE A,I,J OR M)

Explanation: The SYS1.BTLS.LIB.OPT contains an invalid allocation option value. The first character of the options must be A,I,J or M.

System Action: BTLS marks all of the devices

ineligible for allocation, which will cause the job to fail.

System Programmer Response: Redefine the BTLS options using the LIBRARY OPTIONS command.

**BTLS507I CATALOG SEARCH FOR:
BTLS.BTLS.VOL.VVVVVV, FAILED
WITH RETURN CODE= xx**

Explanation: An unexpected return code was received while searching the catalog for a BTLS volume record. The expected return codes are 0 and 8, which indicate either that the volume record was found or that it was

not found. An example of an unexpected return code is 36, which indicates that the volume containing the user catalog is unavailable.

System Action: BTLS marks all of the devices ineligible for allocation, which will cause the job to fail.

System Programmer Response: See message IDC3009I to interpret the return code. Attempt to list the catalog record using the following command:

```
LISTC ENTRY('BTLS.BTLS.VOL.VVVVVV') ALL
```

BTLS abend codes

5C5

Explanation: An error was detected while processing a BTLS Tape Library request.

Register 15 contains a hexadecimal reason code that indicates the type of error.

000

A mount request to a library device failed with ERA=46 (drive not online), and the operator reply to message BTLS203I was 'N'.

Messages

Chapter 5. Error recovery procedures

This chapter describes the error recovery procedures you should perform when a library mount fails. Mount failures are reported by the Basic Tape Library Support (BTLS) error message as in the following examples:

```
BTLS (ERA=67,M,180) SCRATCH CATEGORY EMPTY  
BTLS203I REPLY 'Y' TO RETRY, 'N' TO QUIT
```

```
BTLS*(COD=45,M,180) SCRATCH CATEGORY EMPTY
```

A “BTLS” message indicates that the mount order was not accepted by the IBM 3494 and 3495 library manager. A “BTLS*” message indicates that the mount order was accepted by the library and placed on the library manager’s mount queue, then later failed when the mount was attempted.

In the first example, the scratch mount for device 180 failed because there were no volumes in the scratch category when the mount request was issued. In the second example, there were volumes in the scratch category at the time the mount order was issued. From the time that the mount was accepted until it could be executed, all of the scratch volumes were used.

When BTLS reports a mount failure it does not terminate the job that requested the mount. In most cases the job will continue to wait for the mount to be completed. Recovery from a failed mount can be done as follows:

- Reply 'N' if message BTLS203I was issued.
- Cancel the job that requested the mount.
- Correct the error condition.
- Re-submit the failing job.

An alternative method of recovery is as follows:

- Correct the error condition.
- Reply 'Y' if message BTLS203I was sent to the operator console.
- If message BTLS203I was not sent to the operator console, use the IDCAMS LIBRARY MOUNT command to re-issue the mount.

To re-issue a mount requires submitting a job that executes the IDCAMS LIBRARY MOUNT command, or issuing the LIBRARY MOUNT command as a TSO command. Conventions in use by the installation should be used to create an operator procedure that invokes the IDCAMS LIBRARY command.

Table 25 on page 46 lists the BTLS messages that are sent to the operators console to report library errors and status. To get more information about IBM 3494 and 3495 errors reported by BTLS messages, see *3494 Tape Library Dataserver Operator's Guide* or *3495 Tape Library Dataserver Operator's Guide*. These publications describe the appropriate recovery action for the IBM 3494 and 3495 ERA codes.

Table 25. Error recovery procedures

Error Code	Error Description and Recovery Action
ERA=27	<p data-bbox="354 258 756 279"><i>vvvvv</i>, VOLUME LABEL MISMATCH</p> <p data-bbox="354 310 1406 422">Explanation: The internal volser <i>vvvvv</i> specified for demount does not match the external volser. For standard label tapes the internal and external labels must be the same. The volume is demounted and assigned to the error category. To obtain a list of volumes in the error category issue the following command:</p> <div data-bbox="358 436 1425 491" style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 10px 0;"> <p data-bbox="402 447 854 468">LIBRARY INVENTORY UNIT(ddd) CATEGORY(ERROR)</p> </div> <p data-bbox="354 537 1338 590">Recovery action: Either rewrite the internal label to match the external label, or change the external label to match the internal label.</p>
ERA=43	<p data-bbox="354 611 699 632">LIBRARY DEVICE NOT READY</p> <p data-bbox="354 663 1432 716">Explanation: During mount or demount processing a rewind unload order was issued to a not ready device.</p> <p data-bbox="354 747 1406 800">Recovery Action: If the drive Ready/Not Ready switch is set to the 'ready' position with power on, repair action may be needed.</p>
ERA=60	<p data-bbox="354 821 894 842">ATTACHMENT INTERFACE EQUIPMENT CHECK</p> <p data-bbox="354 873 1373 926">Explanation: The Library Attachment Facility feature in the 3490/3490E/3590 subsystem failed. Communication between the control unit and the Library Manager is not possible.</p> <p data-bbox="354 957 1406 1031">Recovery Action: Cancel the job. If another 3490/3490E/3590 subsystem is in the library, vary the drives associated with the failed subsystem offline and resubmit the job. Contact your service representative.</p>
ERA=62	<p data-bbox="354 1052 886 1073">LIBRARY MANAGER OFFLINE TO SUBSYSTEM</p> <p data-bbox="354 1104 1268 1125">Explanation: The Library Manager is not online to the 3490/3490E/3590 subsystems.</p> <p data-bbox="354 1157 1406 1241">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>. If the library manager can be brought online, redrive the failed mount using the LIBRARY MOUNT command. Otherwise, cancel the job.</p>
ERA=63	<p data-bbox="354 1262 878 1283">LIBRARY MANAGER AND 3490 INCOMPATIBLE</p> <p data-bbox="354 1314 1432 1367">Explanation: The microcode levels of the 3490/3490E/3590 subsystem and the library manager are incompatible.</p> <p data-bbox="354 1398 1406 1472">Recovery Action: Cancel the job. If another 3490/3490E/3590 subsystem is in the library, vary the drives associated with the failed subsystem offline and resubmit the job. Contact your service representative.</p>
ERA=64	<p data-bbox="354 1493 626 1514"><i>vvvvv</i>, VOLUME IN USE</p> <p data-bbox="354 1545 1406 1598">Explanation: The volume <i>vvvvv</i> requested in a mount order is already mounted on another drive. The system issues message BTLS203I and waits for the operator to respond.</p> <p data-bbox="354 1629 1406 1734">Recovery Action: Either respond 'N' to message BTLS203I and cancel the job, or wait for volume <i>vvvvv</i> to be demounted. When volume <i>vvvvv</i> has been demounted, reply 'Y' to message BTLS203I to redrive the mount. The LIBRARY REPORT command can be used to determine where volume <i>vvvvv</i> is mounted.</p>

Table 25. Error recovery procedures (continued)

Error Code	Error Description and Recovery Action
ERA=66	<p data-bbox="383 258 768 279"><i>vvvvv</i>, VOLSER NOT IN LIBRARY</p> <p data-bbox="383 310 1365 363">Explanation: The volume <i>vvvvv</i> requested in a mount order is not in the library manager's inventory. The system issues message BTL203I and waits for the operator to respond.</p> <p data-bbox="383 394 1458 478">Recovery Action: Either respond 'N' to message BTL203I and cancel the job, or insert the volume into the library. When the volume has been inserted, reply 'Y' to message BTL203I to redrive the mount.</p>
ERA=67	<p data-bbox="383 495 914 516">SCRTCH CATEGORY EMPTY (MOUNT FAILED)</p> <p data-bbox="383 548 1458 600">Explanation: A scratch mount failed because there are no volumes left in the scratch category. The system issues message BTL203I and waits for the operator to respond.</p> <p data-bbox="383 632 1458 741">Recovery Action: Either respond 'N' to message BTL203I and cancel the job, or assign volumes to the scratch category. When volumes have been assigned, reply 'Y' to message BTL203I to redrive the mount. Volumes are assigned to the scratch category with the LIBRARY SETCATEGORY command.</p>
ERA=68	<p data-bbox="383 758 610 779">SEQUENCE CHECK</p> <p data-bbox="383 810 1458 863">Explanation: A mount or demount was received out of order by the Library Manager (two mounts or two demounts in a row). This is an expected condition; BTL203I should be able to recover.</p> <p data-bbox="383 894 1458 978">Cancelled or abended jobs can cause library sequence checks. When a job is cancelled while mount pending, the system does not issue a demount. The mount will remain on the library managers work queue even after the job that requested the mount has ended.</p> <p data-bbox="383 1010 1458 1083">When a subsequent job issues a mount to the same device, the subsequent mount will fail with ERA=68. BTL203I recovers ERA=68 by issuing a demount (to cancel the original mount) and then redriving the failed mount.</p> <p data-bbox="383 1115 1458 1171">Recovery Action: Either redrive the failed mount by using the LIBRARY MOUNT command or cancel the job. If the error persists obtain a GTF trace and contact your service representative.</p>
ERA=69	<p data-bbox="383 1188 784 1209">LIBRARY OUTPUT STATIONS FULL</p> <p data-bbox="383 1241 1133 1262">Explanation: The convenience or bulk output station has become full.</p> <p data-bbox="383 1293 1458 1346">Recovery Action: Follow procedures in <i>3494 Tape Library Dataserver Operator's Guide</i> to empty the output station.</p>
ERA=6B	<p data-bbox="383 1362 829 1383"><i>vvvvv</i>, LIBRARY VOLUME MISPLACED</p> <p data-bbox="383 1415 1458 1478">Explanation: Volume <i>vvvvv</i> is flagged by the library manager as misplaced. The system issues message BTL203I and waits for the operator to respond.</p> <p data-bbox="383 1499 1458 1583">Recovery Action: Either respond 'N' to message BTL203I and cancel the job, or follow procedures in <i>3494 Tape Library Dataserver Operator's Guide</i> to return the volume to the library. When the volume has been returned, reply 'Y' to message BTL203I to redrive the mount.</p>
ERA=6C	<p data-bbox="383 1600 813 1621"><i>vvvvv</i>, MISPLACED VOLUME FOUND</p> <p data-bbox="383 1652 1458 1705">Explanation: During processing in the library, volume <i>vvvvv</i> which had been flagged as misplaced was found.</p> <p data-bbox="383 1736 748 1757">Recovery Action: None required.</p>

Table 25. Error recovery procedures (continued)

Error Code	Error Description and Recovery Action
ERA=6D	<p data-bbox="354 258 732 281">LIBRARY DRIVE NOT UNLOADED</p> <p data-bbox="354 310 1425 453">Explanation: A demount was issued to the library manager for a volume that has not been unloaded from the drive. BTLS attempts to recover from ERA=6D by issuing a rewind unload command, then reissuing the failed demount. Note that ERA=6D can be a secondary error condition that occurs when BTLS issues a demount in response to ERA=68 (but even as a secondary error, BTLS should be able to recover from ERA=6D).</p> <p data-bbox="354 478 1425 562">Recovery Action: Unload the drive using the UNLOAD operator command, then demount the volume by using the BTLS LIBRARY DEMOUNT command. If the error persists obtain a GTF trace and contact your service representative.</p>
ERA=6F	<p data-bbox="354 581 651 604">LIBRARY VISION FAILURE</p> <p data-bbox="354 634 1425 718">Explanation: The library vision system has failed, and a library request was issued that requires the vision system. Audit and ejects and adding cartridges to the library cannot be performed while the vision system is failed. All other operations continue to function.</p> <p data-bbox="354 743 943 772">Recovery Action: Contact your service representative.</p>
ERA=70	<p data-bbox="354 791 824 814">LIBRARY MANAGER EQUIPMENT CHECK</p> <p data-bbox="354 844 919 873">Explanation: The library manager is not operational.</p> <p data-bbox="354 898 1425 951">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=71	<p data-bbox="354 970 699 993">LIBRARY EQUIPMENT CHECK</p> <p data-bbox="354 1022 1425 1075">Explanation: The cartridge accessor is not operational. A hardware failure has occurred that requires repair before automated operations can continue.</p> <p data-bbox="354 1100 1425 1161">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=72	<p data-bbox="354 1180 829 1203">LIBRARY NOT CAPABLE - MANUAL MODE</p> <p data-bbox="354 1232 1425 1285">Explanation: A request was made to a library that is in manual mode, and the request requires that the library be in auto mode.</p> <p data-bbox="354 1310 1146 1339">Recovery Action: Resubmit the request when the library is in auto mode.</p>
ERA=73	<p data-bbox="354 1358 776 1381">LIBRARY INTERVENTION REQUIRED</p> <p data-bbox="354 1411 1425 1463">Explanation: A condition in the library prevents any cartridge motion requests from being executed. The library is in the pause mode.</p> <p data-bbox="354 1488 1425 1539">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=75	<p data-bbox="354 1558 721 1581">vvvvv, VOLUME INACCESSIBLE</p> <p data-bbox="354 1610 1425 1663">Explanation: Volume vvvvv is in the library, but cannot be accessed by the cartridge accessor because of a problem with either the cartridge or the cell that contains the cartridge.</p> <p data-bbox="354 1688 1425 1770">Recovery Action: Either respond 'N' to message BTLS203I and cancel the job, or follow procedures in <i>3494 Tape Library Dataserver Operator's Guide</i> to return the volume to service. When the volume has been returned to service, reply 'Y' to message BTLS203I to redrive the mount.</p>

Table 25. Error recovery procedures (continued)

Error Code	Error Description and Recovery Action
ERA=76	<p data-bbox="383 254 683 279">LIBRARY ALL CELLS FULL</p> <p data-bbox="383 306 1459 363">Explanation: All available storage cells in the library are full and there are additional volumes to be inserted.</p> <p data-bbox="383 390 1459 447">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i> or <i>3495 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=77	<p data-bbox="383 464 824 489">vvvvv, DUPLICATE VOLSER EJECTED</p> <p data-bbox="383 516 1459 600">Explanation: While processing a library operation, a volses was found in a storage cell or device. The volses vvvvv is a duplicate of one already in the library. The duplicate volume has been moved to the output station.</p> <p data-bbox="383 627 1459 684">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=78	<p data-bbox="383 701 927 726">vvvvv, DUPLICATE VOLSER IN INPUT STATION</p> <p data-bbox="383 753 1459 810">Explanation: While processing volumes in the convenience input/output station, a volses was found that is a duplicate of one already in the library.</p> <p data-bbox="383 837 1459 894">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=79	<p data-bbox="383 911 935 936">UNREADABLE VOLSER LEFT IN INPUT STATION</p> <p data-bbox="383 963 1459 1020">Explanation: While processing volumes in the convenience input/output station, a volses was found that has an unreadable label, no label, or the label is not valid.</p> <p data-bbox="383 1047 1459 1104">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=7B	<p data-bbox="383 1121 824 1146">vvvvv, VOLUME MANUALLY EJECTED</p> <p data-bbox="383 1173 1459 1230">Explanation: Volume vvvvv has been flagged by the library manager as having been manually ejected. The system issues message BTLS203I and waits for the operator to respond.</p> <p data-bbox="383 1257 1459 1356">Recovery Action: Either respond 'N' to message BTLS203I and cancel the job, or follow procedures in <i>3494 Tape Library Dataserver Operator's Guide</i> to enter the volume into the library. When the volume has been entered into the library, reply 'Y' to message BTLS203I to redrive the mount.</p> <p data-bbox="383 1383 1459 1440">If the volume does not belong in the library, issue the following command to remove it from the library manager database:</p> <div data-bbox="383 1451 1459 1528" style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre data-bbox="431 1467 813 1514">LIBRARY SETCATEGORY VOLUME(vvvvv) - CATEGORY(PURGE) UNIT(ddd)</pre> </div> <p data-bbox="383 1577 1459 1602">Then issue the following command to remove the volume from the BTLS volume catalog:</p> <div data-bbox="383 1612 1459 1671" style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre data-bbox="431 1629 740 1654">LIBRARY DELETE VOLUME(vvvvv)</pre> </div>
ERA=7C	<p data-bbox="383 1709 829 1734">LIBRARY OUT OF CLEANER VOLUMES</p> <p data-bbox="383 1761 1459 1787">Explanation: The library must clean a drive and there are no cleaner volumes in the library.</p> <p data-bbox="383 1814 1459 1862">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>

Table 25. Error recovery procedures (continued)

Error Code	Error Description and Recovery Action
ERA=80	<p data-bbox="354 258 829 279"><i>vvvvv</i>, UNEXPECTED VOLUME EJECTED</p> <p data-bbox="354 310 1425 394">Explanation: While processing a library operation, a volser <i>vvvvv</i> was found in a storage cell or device that is not in the library manager database. The unexpected volume has been moved to the output station.</p> <p data-bbox="354 422 1386 478">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=84	<p data-bbox="354 495 1013 516">DRIVE FAILURE, VARY OFFLINE AND CALL FOR SERVICE</p> <p data-bbox="354 548 1425 604">Explanation: The 3490, 3490E, or 3590 device failed to load or unload a cartridge and is no longer usable. VARY the drive offline.</p> <p data-bbox="354 632 943 657">Recovery Action: Contact your service representative.</p>
ERA=85	<p data-bbox="354 674 748 695">LIBRARY ENVIRONMENTAL ALERT</p> <p data-bbox="354 726 1425 783">Explanation: The 3495 library has detected smoke in the aisle and has stopped all operations with the cartridge accessor.</p> <p data-bbox="354 810 1386 863">Recovery Action: Refer to the Problem Determination Procedures section of <i>3495 Tape Library Dataserver Operator's Guide</i>.</p>
ERA=88	<p data-bbox="354 879 829 900"><i>vvvvv</i>, DAMAGED CARTRIDGE EJECTED</p> <p data-bbox="354 932 1425 989">Explanation: Either cartridge <i>vvvvv</i> is missing its leader block or the tape media is detached from the leader block.</p> <p data-bbox="354 1016 1386 1073">Recovery Action: Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
COD=40	<p data-bbox="354 1089 797 1110"><i>vvvvv</i>, LIBRARY HARDWARE FAILURE</p> <p data-bbox="354 1142 1425 1199">Explanation: The Library Attachment Facility feature in the 3490/3490E/3590 subsystem failed. Communication between the control unit and the Library Manager is not possible.</p> <p data-bbox="354 1226 1425 1310">Recovery Action: Cancel the job. If another 3490/3490E/3590 subsystem is in the library, vary the drives associated with the failed subsystem offline and rerun the job. Contact your service representative.</p>
COD=44	<p data-bbox="354 1327 688 1348"><i>vvvvv</i>, VOLUME MISPLACED</p> <p data-bbox="354 1379 1175 1400">Explanation: Volume <i>vvvvv</i> is flagged by the library manager as misplaced.</p> <p data-bbox="354 1428 1425 1547">Recovery Action: Either cancel the job or follow procedures in <i>3494 Tape Library Dataserver Operator's Guide</i> or <i>3495 Tape Library Dataserver Operator's Guide</i> to return the volume to the library. If the volume is returned to the library, redrive the mount using the LIBRARY MOUNT command.</p>
COD=45	<p data-bbox="354 1564 695 1585">SCRATCH CATEGORY EMPTY</p> <p data-bbox="354 1617 1365 1638">Explanation:A scratch mount failed because there are no volumes left in the scratch category.</p> <p data-bbox="354 1665 1425 1740">Recovery Action: Either cancel the job or assign volumes to the scratch category using the LIBRARY SETCATEGORY command. If volumes are assigned to the scratch category, redrive the mount using the LIBRARY MOUNT command.</p>

Table 25. Error recovery procedures (continued)

Error Code	Error Description and Recovery Action
COD=47	<p data-bbox="383 258 821 279"><i>vvvvv</i>, VOLUME MANUALLY EJECTED</p> <p data-bbox="383 310 1414 363">Explanation: Volume <i>vvvvv</i> has been flagged by the library manager as having been manually ejected.</p> <p data-bbox="383 394 1455 478">Recovery Action: Either cancel the job or follow procedures in <i>3494 Tape Library Dataserver Operator's Guide</i> to enter the volume into the library. If the volume is entered into the library, redrive the mount using the LIBRARY MOUNT command.</p> <p data-bbox="383 510 1398 562">If the volume does not belong in the library, issue the following command to remove it from the library manager database:</p> <div data-bbox="391 569 1455 646" style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;"> <pre data-bbox="431 583 813 632">LIBRARY SETCATEGORY VOLUME(<i>vvvvv</i>) - CATEGORY(PURGE) UNIT(<i>ddd</i>)</pre> </div> <p data-bbox="383 695 1341 716">Then issue the following command to remove the volume from the BTLS volume catalog:</p> <div data-bbox="391 730 1455 785" style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;"> <pre data-bbox="431 745 740 766">LIBRARY DELETE VOLUME(<i>vvvvv</i>)</pre> </div>
COD=48	<p data-bbox="383 825 805 846"><i>vvvvv</i>, VOLUME NOT IN INVENTORY</p> <p data-bbox="383 877 1365 930">Explanation: The volume <i>vvvvv</i> requested in a mount order is not in the library manager's inventory.</p> <p data-bbox="383 961 1455 1014">Recovery Action: Either cancel the job or insert the volume into the library. If the volume is inserted into the library, redrive the mount using the LIBRARY MOUNT command.</p>
COD=49	<p data-bbox="383 1035 748 1056"><i>vvvvv</i>, DEVICE NOT AVAILABLE</p> <p data-bbox="383 1087 1414 1140">Explanation: The 3490, 3490E, or 3590 device failed to load or unload volume <i>vvvvv</i> cartridge and is no longer usable.</p> <p data-bbox="383 1171 1446 1192">Recovery Action: VARY the device offline and cancel the job. Contact your service representative.</p>
COD=4A	<p data-bbox="383 1213 862 1234"><i>vvvvv</i>, UNRECOVERABLE LOAD FAILURE</p> <p data-bbox="383 1266 1414 1318">Explanation: The 3490, 3490E, or 3590 device failed to load or unload volume <i>vvvvv</i> cartridge and is no longer usable.</p> <p data-bbox="383 1350 1446 1371">Recovery Action: VARY the device offline and cancel the job. Contact your service representative.</p>
COD=4B	<p data-bbox="383 1392 854 1413"><i>vvvvv</i>, DAMAGED CARTRIDGE EJECTED</p> <p data-bbox="383 1444 1446 1497">Explanation: Either cartridge <i>vvvvv</i> is missing its leader block or the tape media is detached from the leader block.</p> <p data-bbox="383 1528 1446 1581">Recovery Action: Cancel the job. Refer to the Problem Determination Procedures section of <i>3494 Tape Library Dataserver Operator's Guide</i>.</p>
MSG=01	<p data-bbox="383 1602 699 1623">ERROR RECOVERY FAILED</p> <p data-bbox="383 1654 1438 1675">Explanation: While attempting to recover from an error, BTLS exceeded the limit of 20 I/O retries.</p> <p data-bbox="383 1707 1446 1747">Recovery Action: Cancel the job. If the error persists obtain a GTF trace and contact your service representative.</p>

Table 25. Error recovery procedures (continued)

Error Code	Error Description and Recovery Action
MSG=02	<p data-bbox="354 258 764 279">ERROR RECOVERY FAILED, IOS=xx</p> <p data-bbox="354 310 1409 363">Explanation: While attempting to recover from an error, BTLS encountered an I/O error other than unit check.</p> <p data-bbox="354 394 1409 478">Recovery Action: Cancel the job. Code xx is the IOSCOD value returned by the I/O supervisor (IOS). Refer to the description of IOSCOD in macro IECDIOSB. If the error persists obtain a GTF trace and contact your service representative.</p>
MSG=03	<p data-bbox="354 495 773 516">ERROR RECOVERY FAILED, ERA=xx</p> <p data-bbox="354 548 1409 600">Explanation: While attempting to recover from an error, BTLS encountered a unit check for which BTLS has no error recovery.</p> <p data-bbox="354 632 1425 709">Recovery Action: Cancel the job. Code xx is the error recovery action code (ERA) from sense byte 3. Refer to the ERA description in the Users Guide for the device. Contact your service representative.</p>
MSG=04	<p data-bbox="354 726 870 747">vvvvv, UNALLOCATED DEVICE DEMOUNTED</p> <p data-bbox="354 779 1409 863">Explanation: The AUTODEMOUNT option was specified in parmlib member BTLPRM00 and a mount completed successfully for an unallocated device. Normally, this is caused by a job being cancelled or abending while mount pending.</p> <p data-bbox="354 894 1409 947">Recovery Action: None required. Volume vvvvv has been demounted from the device. Both the device and the volume are available for use.</p>
MSG=05	<p data-bbox="354 963 773 984"><i>LIBRARY STATE CHANGE MESSAGE</i></p> <p data-bbox="354 1016 1409 1079">Explanation: A state change has occurred in the library. The following <i>state change messages</i> are reported:</p> <ul data-bbox="354 1079 678 1142" style="list-style-type: none"> • LIBRARY IN PAUSE MODE • LIBRARY IN AUTO MODE <p data-bbox="354 1173 716 1194">Recovery Action: None required.</p>
MSG=06	<p data-bbox="354 1215 667 1236"><i>LIBRARY ORDER TIMEOUT</i></p> <p data-bbox="354 1268 1425 1495">Explanation: The I/O operation to send a mount or demount order to the library was terminated with an IOSCOD=48, indicating that the I/O was purged. One possible cause is that while waiting for the library to accept the order, the job requesting the mount was cancelled or terminated and the outstanding I/O for the job was purged. Another possible cause is that the BTLS mount timer expired and has purged the I/O. BTLS sets a 10 minute timer to limit the time that it will wait for the Library Manager to accept a mount order onto its work queue. The time needed to perform the mount can take longer, but BTLS limits the time needed to send the order from the host to the Library Manager.</p>

Appendix A. Allocation diagnostic support

The library allocation support provides a trace function to assist in problem determination. The trace function is invoked by the catalog OPTION entry 'T'. Library allocation data is traced to the job log. Each trace record contains the following:

```
*****
BTLTRACE: ddname (nn),ooo,uuuu,1111,(eeee,ee),OK,VOL=vvvvvv,aabccdd,
          (ss)eeff.t
BTLTRACE DEVICE LIST:
D80 D81 D82 D83*D84*D85*D86*D87      (devices with * are not eligible)
D88 D89 D8A D8B*D8C*D8D*D8E*D8F
D90 D91 D92 D93*D94*D95*D96*D97
D98 D99 D9A D9B*D9C*D9D*D9E*D9F
*****
```

ddname	<i>name</i> used in the DD statement
nn	DD concatenation position.
ooo	Options (for example, JTE)
uuuu	Catalog name
1111	Library name
eeee,ee	Data returned by installation exit (library name,flag byte).
OK	May be 'OK', which indicates that the return code from BTL allocation to common allocation is good and that the installation exit is not installed. Will be '*K' if the BTL return code is not zero, and will be 'O*' if the installation exit is installed and the BTL return code is zero. '**' indicates that the installation exit is installed and the BTL return code is not zero.
vvvvvv	<i>volser</i> for the specific request.
aabccdd	Reserved (flag bytes for library allocation logic).
(ss)	Allocation control parameter word or "NA".
ee	Internal number of the DD statement (referenced by UNIT=AFF).
ff	Internal number of referenced DD statement for UNIT=AFF. Contains '00' when UNIT=AFF is not used.
t	Either 'L', 'M', or 'A' to indicate whether a LIBRARY device, a MANUAL device(non-library), or ANY device is to be allocated.
Device List	A list of all devices in the eligible device list. Devices marked by '**' have been marked for exclusion.

Appendix B. installation exits

Programming Interface information

This appendix contains Programming Interface information.

End of Programming Interface information

This appendix is intended to help you to extend or replace IBM-supplied functions.

Installation exits are provided to allow you to extend or replace IBM-supplied functions at your installation. You can substitute your own installation exit routines for the Basic Tape Library Support (BTLS) replaceable modules. Installation-written exits give you greater control within your processing environment to help you to customize the Basic Tape Library Support operation to better meet your site's requirements.

Set category installation exit

The set category installation exit, IDCLI04, is an installation exit called by IDCLI01 when the SETCEXIT command is specified. This installation exit allows you to specify the *volser* and *category* to be sent to the tape library as a SETCATEGORY order.

As distributed, IDCLI04 is a test installation exit that attempts to set 3 volumes (BTLS01,BTLS02,BTLS03) to the SCRTCH category. IDCLI04 is called in problem state, and must be linked into load module IDCLI01, replacing the test version of IDCLI04. You must code IDCLI04 as reentrant.

Entry to IDCLI04 is as follows:

```
REG0    = undefined
REG1    = address of 4 word parameter list,
         defined as follows:
WORD1 - addr of 6 byte volser (set by IDCLI04).
         For example: BTLS01,BTLS02,BTLS03.
WORD2 - addr of 8 byte category name (set by IDCLI04)
         For example: SCRTCH,EJECT,XEJECT.
WORD3 - addr of 1 byte category name length (IDCLI04)
         For example: 6,5,6.
WORD4 - addr of 200 byte work area. This area is set
         to zero on first entry, unchanged thereafter.
REG2-12 = undefined
REG13   = address of 18 word save area
REG14   = address of IDCLI01 return.
REG15   = entry point address of IDCLI04.
```

Exit from IDCLI04 is as follows:

```
REG0-14 = same as entry
REG15   = return code defined as follows:
         0 - terminate (normal)
         4 - Send a SETCATEGORY order to the library.
        12 - terminate (abnormal)
```

Allocation installation exit

AOMABEXT is an installation exit called by AOMAB433 that can be used to control library allocation. The installation exit is optional, and is not invoked if it does not exist.

Entry to AOMABEXT is as follows:

```
AMODE(31),RMODE(ANY),Supervisor state,System protect key 0, Reentrant.
REG0   = undefined
REG1   = address of 5 word parameter list,
        defined as follows:
        WORD1 - address of 1 byte bit string.
                1111 1...  FLAG1  Reserved for AOMAB433 use.
                .... .1..  ANYLIB Set by AOMABEXT for ANY LIBRARY
                .... ..1.  NOLIB Set by AOMABEXT for NO LIBRARY
                .... ...1  FLAG2  Reserved for AOMAB433 use.
        WORD2 - address of 4 byte LIBNAME(library name).
                Contains 'blanks' at entry to AOMABEXT.
                May be set to library name by AOMABEXT.
        WORD3 - address of Volunit Table Entry (VUNT).
        WORD4 - address of SIOT.
        WORD5 - address of TCB.
REG2-12 = undefined
REG13   = address of 18 word save area
REG14   = address of AOMAB433 return.
REG15   = entry point address of AOMABEXT.
```

To use the installation exit, AOMABEXT must be link-edited with module AOMAB433. If it is not link-edited with AOMAB433, the installation exit will not be called. The installation exit routine that you code for AOMABEXT must be re-entrant.

The installation exit can influence an allocation in one (and ONLY one) of the following ways:

- Do nothing, indicating that AOMAB433 should determine the allocation.
- Store a library name (e.g.LIB1,LIB2) into LIBNAME, indicating that the allocation should be directed to a device in the named library.
- Set ANYLIB, indicating that the allocation should be directed to a device in any library.
- Set NOLIB, indicating that the allocation should exclude all library devices.

Notes:

1. Setting ANYLIB or NOLIB must not modify any of the reserved fields in the parameter byte.
2. When SP™ 5.2 is installed, WORD3,WORD4 and WORD5 of the AOMABEXT interface are changed as follows:

```
WORD3 - address of SSTADRA (Device request array entry)
WORD4 - address of SSTADDA (DD array entry)
WORD5 - address of SSTA   (Tape Allocation SSI parameters)
```

For a description of the Tape Allocation SSI see *z/OS MVS Using the Subsystem Interface*.

Message display installation exit

The Message Display installation exit (IGXMSGEX) is an existing installation exit. See *z/OS DFSMS Installation Exits* for a description of IGXMSGEX. When BTLS is installed, the message display installation exit IGXMSGEX can be used to select which BTLS scratch category is used to satisfy a library scratch mount.

As described in either of the above publications, the IGXMSGEX interface includes MSGTEXT, which is pointed to by MSGTXADR. MSGTEXT consists of a format control byte followed by two 8-byte display data fields. With BTLS installed, the first 8 byte display field can be used to indicate a scratch category name that BTLS should use for a scratch mount. Upon return from IGXMSGEX, BTLS will test the first seven bytes of the display data for the characters SCRTCH1,SCRTCH2,SCRTCH3, SCRTCH4,SCRTCH5,SCRTCH6, SCRTCH7,SCRTCH8. If one of the supported scratch names is found, then that scratch category will be used to 'override' the scratch category that would otherwise be used.

Appendix C. MOUNT and DEMOUNT examples

The examples that follow show typical mount and demount operations using BTLS and a tape library.

Successful SCRATCH mount

The following is an example of a successful scratch mount. A scratch volume is successfully mounted on library drive 9A0. When the mount completes the tape is processed and then demounted and assigned to the private category.

During *OPEN* processing for the tape dataset, mount message IEC501A **1** is sent to the operators console. The message requests that a PRIVAT scratch tape be mounted. The mount message causes BTLS to send an order to the tape library to mount a tape from the scratch category on 9A0. The job that requested the mount will then become *mount pending*, while *OPEN* waits for the tape drive to become *ready*.

To satisfy the mount request the library manager selects a tape from the scratch category. After the robot mounts the tape, the library presents *attention* status to the host to indicate that an event has completed and a status message is available. The *attention* causes BTLS to send an order to the library to read the status message. The status message in this example is a successful mount completion message, which causes BTLS to make the device *ready* (no longer *mount pending*).

When the device becomes ready, *OPEN* reads the internal volume label and issues message IEC705I **2**. After processing the tape, the tape dataset is *CLOSED* and the job ends. During de-allocation, message IEF234E **3** is issued to *keep* the tape. The *keep* message causes BTLS to send a demount order to the library. The demount order causes the volume to be removed from the scratch category and assigned to the private category.

```
1 $HASP373 TEST01  STARTED
2 *IEC501A M 09A0,PRIVAT,SL,
3 IEC705I TAPE ON 09A0,001300,SL,
  IEF234E K 09A0,001300,PVT,
  $HASP395 TEST01  ENDED
```

Mount error recovery

The following example shows a scratch mount that fails because the library scratch category is empty. The failed mount is recovered after a tape is assigned to the scratch category.

When a scratch mount is issued for STEP1 **1**, BTLS sends a mount order to the library, which accepts the order. For each scratch mount, BTLS obtains the scratch category count from the tape library and compares the count to the threshold. If the count is below the threshold it is displayed with message BTLS202I **2**. When scratch tape 002400 is demounted **3**, BTLS sends an order to the library to assign it to the private category. In the example, there will be no volumes in the scratch category following the demount of 002400.

In STEP2 another scratch mount is issued by BTLS in response to message IEF233A **4**. This mount is rejected by the library with a unit check that includes ERA=67. BTLS reports the error **5** and then asks the operator whether to retry or

quit **6**. In the example, the operator executed the LIBRARY command from TSO to assign volume 002401 to the scratch category **7**. The operator then replied 'Y' **8** to the BTLS203I message and the mount was retried successfully.

```

1 *IEF233A M 09A0,PRIVAT,SL,ATMJOB,STEP1
2 *BTLS202I: SCRATCH VOLUMES BELOW THRESHOLD...COUNT=0001
    IEC705I TAPE ON 09A0,002400,SL,COMP,ATMJOB,STEP1
3   IEF234E K 09A0,002400,PVT,ATMJOB,STEP1

4 *IEF233A M 09A0,PRIVAT,SL,ATMJOB,STEP2
5 *BTLS (ERA=67,M,9A0) SCRATCH CATEGORY EMPTY (MOUNT FAILED)
6 *06 BTLS203I: REPLY 'Y' TO RETRY, 'N' TO QUIT

7   TSO LIBRARY SETCATEGORY VOLSER(002401) CATEGORY(SCRATCH)

8   R 6,Y
    IEE600I REPLY TO 06 IS;Y
    *BTLS202I: SCRATCH VOLUMES BELOW THRESHOLD...COUNT=0001
    IEC705I TAPE ON 09A0,002401,SL,COMP,ATMJOB,STEP2
    IEF234E K 09A0,002401,PVT,ATMJOB,STEP2
  
```

Mount failure

In the following example a mount is issued for volume 001300. Volume 001300 had been inside the library, but was removed and sent off-site. The volume was removed using the EJECT category **1**, so the BTLS volume catalog record was not deleted (EJECTX will delete the volume catalog record). Because the volume catalog record was not deleted, BTLS believes that the volume is still in the library, so has allocated a device inside the library. The 'volume not in library' error **2** is reported by BTLS and the operator is asked by message BTLS203I **3** whether to retry the mount or not.

If the volume was still available, the operator could insert the volume into the library and reply 'yes' to BTLS203I. Since the volume is not available, the operator must reply 'no' and then must cancel the job **4**.

With BTLS, a library mount operates much like a human mount on a manual tape drive. The job that requested the mount waits (mount pending) for the mount to be completed. When the robot mounts the tape the pending mount is satisfied. If the library cannot satisfy the mount, the job remains mount pending and **must** be cancelled.

```

1   TSO LIBRARY SETCATEGORY VOLSER(001300) CATEGORY(EJECT)
    $HASP373 TEST02   STARTED
    *IEC501A M 09A2,001300,SL,COMP,TEST02,...
2 *BTLS (ERA=64,M,9A2) 001300, VOLSER NOT IN LIBRARY
3 *03 BTLS203I: REPLY 'Y' TO RETRY, 'N' TO QUIT
    R 3,N
4   CANCEL TEST02
    $HASP395 TEST02   ENDED
  
```

Appendix D. Migration to DFSMS

Migration from a BTLS library to a DFSMS library requires the following:

- Creating DFSMS Tape Configuration Database VOLCAT entries for all of the volumes in the BTLS library(s).
- Changing the category code in the library manager for all of the volumes (from BTLS category codes to DFSMS category codes).

The LIBRARY MIGRATE command is provided to help create the TCDB VOLCAT records and to change category codes of volumes in the library.

BTLS on the web

For up-to-date information on migrating to DFSMS, go to the DFSMS/MVS Technical Support page:

SSDDOM01.storage.ibm.com/techsup/techdoc.nsf/webviewdfsms

Select the BTLS option to see a list of links to the latest BTLS information.

The MIGRATE command

The MIGRATE command is used to migrate to DFSMS managed tape. The syntax of the MIGRATE command and a description of each parameter follows.

LIBRARY	MIGRATE	SETUP TCDBGEN CHANGECAT RESETCAT LIST UNIT (<i>unit</i>) BTLSLIB (<i>btls-library-name</i>) SMSLIB (<i>dfsms-library-name</i>) DEVICETYPE (3490 3490E 3590) ERRORS
---------	---------	--

where:

MIGRATE

Specifies that one of the following migration functions should be performed:

SETUP

A Read Volume Data command will be issued to the library manager to obtain information about each volume in the named BTLS library. The information will be saved in the BTLS volume catalog record for each volume. SETUP is required before the other MIGRATE functions can be performed.

If the ERRORS keyword is specified, only volumes with error status will be processed by SETUP. When ERRORS is not specified, SETUP will always execute from the beginning of the volume list for the named library. If a SETUP job ends prematurely and is executed again, all of the volumes will be processed from the beginning (not from the point of interruption).

If volume status should change between the time that SETUP is run and the time that migration is to take place, SETUP should be run again (successful migration requires accurate setup data).

TCDBGEN

Specifies that an IDCAMS 'CREATE VOLUMEENTRY' statement is to be

created for each volume in the named BTLS library. The CREATE VOLUMEENTRY statements will be created in the LIBOUT dataset. The LIBOUT dataset can then be used as SYSIN data for an IDCAMS job that will create TCDB volume entries.

Note: The CREATE command is used to create volume entries in the DFSMS tape configuration database(TCDB). The CREATE commands must be executed on the system that is being migrated to.

The following are examples of the records created by TCDBGEN:

```
CREATE VOLENT (NAME(VT000001) LOC(LIBRARY) LIBNAME(SMSLIB1 ) -
              UATTR(SCRATCH) MTYPE(MEDIA1))

CREATE VOLENT (NAME(VT000002) LOC(LIBRARY) LIBNAME(SMSLIB1 ) -
              UATTR(SCRATCH) MTYPE(MEDIA2))

CREATE VOLENT (NAME(VT000003) LOC(LIBRARY) LIBNAME(SMSLIB1 ) -
              UATTR(PRIVATE) MTYPE(MEDIA1) -
              COMP(UNKNOWN) REC(36TRACK))

CREATE VOLENT (NAME(VT000004) LOC(LIBRARY) LIBNAME(SMSLIB1 ) -
              UATTR(PRIVATE) MTYPE(MEDIA1) -
              COMP(UNKNOWN) REC(18TRACK))

CREATE VOLENT (NAME(VT000005) LOC(LIBRARY) LIBNAME(SMSLIB1 ) -
              UATTR(PRIVATE) MTYPE(MEDIA2) -
              COMP(UNKNOWN) REC(36TRACK))
```

CHANGE CAT

Issues a SETCATEGORY order to the library manager to change BTLS category codes to the appropriate DFSMS category code for each volume in the named BTLS library. The SETCATEGORY will fail if the current category code of a volume is not the expected BTLS code that was recorded during SETUP.

RESET CAT

Issue a setcategory order to the library manager to change DFSMS category codes back to the appropriate BTLS category code for each volume in the named BTLS library. The SETCATEGORY will fail if the current category code of a volume is not the expected DFSMS code that was recorded during CHANGE CAT.

LIST

A report will be produced that contains migration information and status about each volume in the named BTLS library. The LIST report can be generated following any stage of migration (or following a migration stage that ends prematurely). If the ERRORS keyword is specified, only volumes with error status will be listed.

UNIT(*unit*)

unit specifies the device used to communicate with the library. The UNIT parameter is required when SETUP, CHANGE CAT or RESET CAT is specified.

BTLSLIB(*btss-library-name*)

btss-library-name specifies the 4 character BTLS library name (LIB1,LIB2,etc.). The BTLSLIB parameter defaults to BTLSLIB(LIB1). If a library other than LIB1 is used, the BTLSLIB parameter is required for all MIGRATE operations.

SMSLIB(*dfsms-library-name*)

dfsms-library-name specifies the 1 to 8 character name that will be used by DFSMS to reference the library. The SMSLIB parameter is required when TCDBGEN is specified.

DEVICETYPE(3490|3490E|3590)

Specifies the device type of devices in the BTLS library. The DEVICETYPE parameter is required when SETUP is specified.

Correct specification of 3490 or 3490E is critical for successful migration. During SETUP, the BTLS MIGRATE command uses the DEVICETYPE that you specify to determine the recording technology of PRIVATE volumes.

Recording technology is either 18 or 36 track (a PRIVATE volume created on 3490 is always 18TRK, while a PRIVATE volume created on 3490E is always 36TRK).

The DEVICETYPE that you specify is used by BTLS to identify recording technology in the CREATE VOLENT statements that are created when you execute the LIBRARY MIGRATE TCDBGEN command. The TCDBGEN command creates VOLENT statements that contain either REC(18TRACK) or REC(36TRACK). The following are two examples of CREATE VOLENT statements:

```
CREATE VOLENT (NAME(VOL001) LOC(LIBRARY)
LIBNAME(SMSLIB1) UATTR(PRIVATE)
MTYPE(MEDIA) COMP(UNKNOWN) REC(18TRACK)
CREATE VOLENT (NAME(VOL002) LOC(LIBRARY)
LIBNAME(SMSLIB1) UATTR(PRIVATE)
MTYPE(MEDIA) COMP(UNKNOWN) REC(36TRACK)
```

Incorrect recording technology information can cause allocation errors under SMS. For example, if you specify 3490E, and the library has only 3490 devices, SMS will assume that none of the devices in the library are capable of reading the volumes. This occurs because of the incorrectly created TCDB record.

If you should determine that such an error was made, do the following:

1. If the LIBRARY MIGRATE TCDBGEN step has not executed yet, correct the DEVICETYPE parameter and execute the LIBRARY MIGRATE SETUP command again. Be sure to omit the ERROR parameter so that the MIGRATE SETUP command will restart from the beginning.
2. If the LIBRARY MIGRATE TCDBGEN step has executed, you can either discard the TCDBGEN output and execute step 1 above, or correct the TCDBGEN output. The corrected output is then used as input to IDCAMS in order to create a TCDB.
3. If the TCDB has already been created, either delete it and start with step 1 or 2 above, or correct the TCDB. Change the CREATE VOLENT records into ALTER VOLENT records, correct the incorrect RECORDING(xxTRACK) statements, then use these records to update the TCDB.

ERRORS

Valid when SETUP or LIST is specified. ERRORS indicates that only volumes with error status are to be processed by SETUP or by LIST.

Examples

BTLS users with mixed device types in the same library should do the following. Create 1 'logical' BTLS library for each device type, then assign only CST1 cartridges to the 3490 library(e.g.LIB1) and only CST2 to the 3490E library(e.g. LIB2). If there are any CST1 cartridges that must be used on a 3490E, they can be assigned to LIB2. For migration, the user must be able to indicate the device type that was last used by BTLS private tapes.

```

3495=====> 1 string 3490's (180-188)
             1 string 3490E's (190-189)
             500 CST1 cartridges
             500 CST2 cartridges

```

```

BTLS LIB1=> (180-188),400 CST1's
BTLS LIB2=> (190-198),100 CST1's,500 CST2's

```

```

LIBRARY MIGRATE SETUP      BTLSLIB(LIB1) UNIT(180) DEVICETYPE(3490)
LIBRARY MIGRATE LIST      BTLSLIB(LIB1)
LIBRARY MIGRATE CHANGECAT BTLSLIB(LIB1) UNIT(180)
LIBRARY MIGRATE TCDBGEN   BTLSLIB(LIB1) SMSLIB(SMSLIB1)

```

```

LIBRARY MIGRATE SETUP      BTLSLIB(LIB2) UNIT(190) DEVICETYPE(3490E)
LIBRARY MIGRATE LIST      BTLSLIB(LIB2)
LIBRARY MIGRATE CHANGECAT BTLSLIB(LIB2) UNIT(190)
LIBRARY MIGRATE TCDBGEN   BTLSLIB(LIB2) SMSLIB(SMSLIB1)

```

The migration report

The purpose of the migration SETUP function is twofold. First, the SETUP function obtains required volume information from the library manager and saves the information in the BTLS volume catalog records for use by other migration functions. Second, the LIST report that can be generated provides the user with the opportunity to understand what will occur during migration and to verify volume status. The following is an example of the report created by the LIBRARY MIGRATE LIST command.

VOLSER	MEDIA	BTLSCAT	SMSCAT	RECORDING	STATUS	ERROR MESSAGE
-----	-----	-----	-----	-----	-----	-----
T00001	MEDIA1	SCRTCH	SMSMED1	N/A	BTLS	
T00002	MEDIA1	SCRTCH	SMSMED1	N/A	BTLS	
T00021	MEDIA2	SCRTCH4	SMSMED2	N/A	BTLS	
T00022	MEDIA2	SCRTCH4	SMSMED2	N/A	BTLS	
T00023	MEDIA2	PRIVATE	SMSPRIV	36TRACK	BTLS	
T00024	MEDIA2	PRIVATE	SMSPRIV	36TRACK	BTLS	
T00025	MEDIA2	PRIVATE	SMSPRIV	36TRACK	BTLS	

Notes:

1. The STATUS field indicates the current library manager category assignment for the volume (whether the volume is assigned to a BTLS or DFSMS category).
2. In the event that a MIGRATE function terminates prematurely, the operation will restart at the point of interruption when the job is resubmitted.

ERROR MESSAGES have the following format:

```
(X) error text
```

'X' is a character that indicates the MIGRATE function that detected the error (S=SETUP, C=CHANGE CAT, R=RESETCAT, T=TCDBGEN).

The following error text messages are supported:

UNEXPECTED CATEGORY=XXXX - A CHANGE CAT or RESETCAT function detected that the category code of the volume has changed. For example, the

volume may have been a scratch volume when SETUP was executed, but was changed to private prior to executing the CHANGE CAT function.

SETUP IS REQUIRED - The volume has not been successfully processed by SETUP.

VOLUME NOT IN LIBRARY - A volume listed in the BTLS catalog is not in the library.

VOLUME UNAVAILABLE(IN USE) - A volume listed in the BTLS catalog is unavailable (may be in the process of being ejected).

TERMINATED BY I/O ERROR - A permanent I/O caused the MIGRATE function to terminate.

Usage notes

MIGRATE functions are controlled by the information obtained during SETUP. SETUP should be executed until a 'clean' LIST is obtained. Any volumes with error status will cause a non-zero return code from LIST.

Any errors listed in the ERROR report should be corrected, then the SETUP should be rerun. For example, for migration error 'VOLUME NOT IN LIBRARY', the corrective action might be to DELETE the BTLS catalog record for the volume. Message '(S) UNEXPECTED CATEGORY' indicates that the volume is not assigned to a BTLS category code; delete the volume from BTLS, or set the category properly. After errors have been corrected, execute LIBRARY MIGRATE SETUP ERRORS to re-execute SETUP for volumes that were listed in error.

When the SETUP report is error free, execute the MIGRATE TCDBGEN function. This produces IDCAMS commands to create TCDB volume entries.

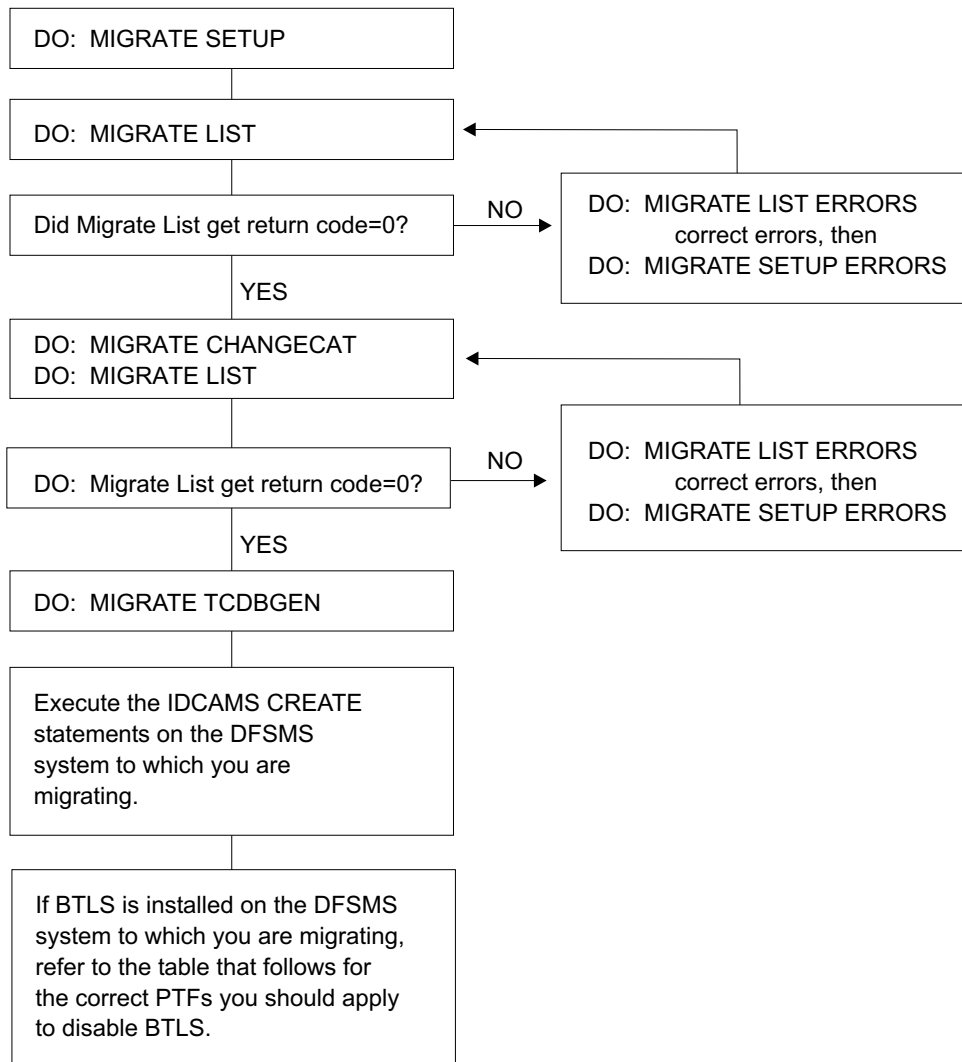
The MIGRATE CHANGE CAT command will set the category for each BTLS volume to the appropriate DFSMS category. If it is necessary to return the volumes to BTLS, the MIGRATE RESET CAT command will change the volumes back to BTLS category codes.

Tests indicate that SETUP, CHANGE CAT and RESET CAT, each take about 1-2 minutes for 100 volumes. TCDBGEN and report operations do not use the ATL and execute quickly.

Consider doing a trial run with a small subset of volumes in order to validate the sequence of operations. For example, define some volumes under an unused library name such as LIB8. Then perform the migrate process for BTLSLIB(LIB8).

Migration steps

Figure 1 on page 66 shows the steps that you follow during migration.



BTLU601

Figure 1. Migration to DFSMS

See Table 26 for information on the APARs required before you can disable BTLS and migrate to DFSMS.

Table 26. Required APARs

FMID	Required APARs
JDZ111S	OW03323; OW18860
JDZ11BS	OW17868; OW18860
JDZ11CS	OW17868; OW18860
JDZ11DS	OW28259
JDZ11ES	OW36485
JDZ11FS	OW46288

Note: In addition to installing the disabling APAR, the BTLPRM00 member of SYS1.PARMLIB can be deleted. It is not necessary to delete BTLPRM00, but if it is deleted the following messages will be received during IPL:

IEA301I BTLPRM00 NOT-FOUND-IN SYS1.PARMLIB

The IEA301I message can be ignored.

SETCATEGORY changes

In addition to the new MIGRATE command, the following new category names will be supported by the BTL SETCATEGORY command. These new categories provide a means of 'manually' moving a single volume (or list of volumes) to DFSMS categories.

SMSPRIV - The DFSMS private category ('000F'X).

SMSMED1 - The DFSMS media1 scratch category ('0001'X).

SMSMED2 - The DFSMS media2 scratch category ('0002'X).

SMSMED3 - The DFSMS 3590 scratch category ('0003'X).

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Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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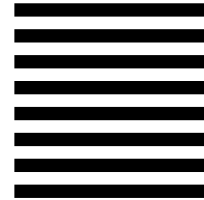
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