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Device Support Facilities User's Guide and Reference

5.0

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The changes for this edition are summarized under "Summary of Amendments" following the preface. Specific changes are indicated by a vertical bar to the left of the change. These bars will be deleted at any subsequent republication of the page affected. Editorial changes that have no technical significance are not noted.

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PREFACE

This publication describes the Device Support Facilities processor and commands. It also discusses hardware considerations, operating system considerations, and planning and installation. It is written for installation managers, system programmers, system operators, and other data processing personnel who manage or use direct access storage devices (DASD).

Wherever an IBM operating system is discussed, it is assumed readers understand the concepts and terms used in that operating system.

MAJOR DIVISIONS OF THIS PUBLICATION

For convenience, information on Device Support Facilities is presented under two major headings:

- "Part 1. General Information" describes Device Support Facilities and how it is used by the system programmer and the system operator.
- "Part 2. Reference Information" describes in detail the syntax and function of the Device Support Facilities commands.

Appendix A contains description and figures showing volume layout and record formats. Appendix B describes support for the minidisk under VM/370. Appendix C lists and explains Device Support Facilities messages. Appendix D contains problem determination information. Appendix E describes the VTOC index, and gives information on calculating the size of the index data set. Appendix F describes the fixed block architecture VTOC (FBAVTOC) and gives information on calculating the FBAVTOC space requirements. Appendix G describes the device surface analysis performed by Device Support facilities.

CONVENTIONS USED IN THIS PUBLICATION

The illustrations of command formats in this book use the following conventions:

- Brackets ([]) indicate an optional field or parameter.
- Braces ({}) indicate that one of alternative items must be selected.
- Items separated by a vertical bar (|) represent alternative items. Only one item may be selected.
- An ellipsis (•••) indicates that multiple entries of the type immediately preceding the ellipsis are allowed.
- **Boldface** type indicates the exact characters to be entered. Such items must be entered as shown or in the abbreviated form allowed.
- Underscored uppercase type indicates a default option. If the parameter is omitted, the default value is assumed.
- Underscored lowercase or lowercase type indicates fields to be supplied by you.

- Parentheses, commas, slashes, spaces, and other punctuation must be entered as shown.
- Numeric parameters can be coded in two ways: decimal or hexadecimal (X'n'). This applies to any parameter that specifies a substitution of decimal numbers.
- Character string parameters can be coded either with or without enclosing them in single quotation marks. However, if delimiters such as commas, blanks, or parentheses appear within a character string, the string must be enclosed within single quotation marks.

PREREQUISITE PUBLICATIONS

IBM System/370 and 4300 Processors Bibliography, GC20-0001, describes the publications that are applicable and current for OS/VS and DOS/VSE operating systems.

RELATED PUBLICATIONS

Other books that may be helpful to you are:

- Device Support Facilities Logic, SY35-0030, describes the program logic of Device Support Facilities.
- IBM 3850 Mass Storage System (MSS) Introduction and Preinstallation Planning, GA32-0038, introduces the concepts of the Mass Storage System.
- Operator's Library: IBM 3850 Mass Storage System (MSS) Under OS/VS, GC35-0014, describes commands used with the Mass Storage System.
- Data Facility Device Support: User's Guide and Reference, SC26-3952, describes the index to the table of contents (VTOC) and tells how the index is created and used.
- OS/VS2 MVS Resource Access Control Facility (RACF) General Information Manual, GC28-0722, describes the functions and capabilities of access control.
- OS/VS2 System Programming Library: Supervisor, GC28-0628, describes the authorized program facility and service management (SRB dispatching).
- Component Summary—1835 Storage Control, 2305 Fixed Head Storage, GA26-1589, describes the 2305 direct access storage device.
- IBM System 360—Component Descriptions, 2314 Direct Access Storage Facility and 2844 Auxiliary Storage Control, GA26-3599, describes the 2314 direct access storage device.
- IBM 2319 Disk Storage—A Series, Component Description, GA26-1606, describes the 2319 direct access storage device.
- IBM 3310 Direct Access Storage Reference Manual, GA26-1660, describes the 3310 fixed block storage device.
- Reference Manual for IBM 3330, A Series, Disk Storage, GA26-1615, describes the 3330 direct access storage devices.
- Reference Manual for IBM 3340-3344 Disk Storage, GA26-1619, describes the 3340 and 3344 direct access storage devices.

- Reference Manual for IBM 3350 Direct Access Storage, GA26-1638, describes the 3350 direct access storage device.

- Introduction to IBM 3370 Direct Access Storage, GA26-1657, describes the 3370 storage system and its fixed block data format.

- Introduction to 3375 Direct Access Storage, GA26-1666, describes the 3375 direct access storage device.

- IBM 3380 Direct Access Storage Description and User's Guide, GA26-1664, describes the 3380 direct access storage device.

SUMMARY OF AMENDMENTS

RELEASE 5.0

NEW SUPPORT

The IBM 3310 and 3370 fixed block architecture (FBA) devices are now supported by the INIT, INSPECT, and REFORMAT commands. This support is available in the DOS/VSE and stand-alone environments. The INIT command allows you to initialize the 3310 and 3370 at minimal and maximal levels. The INSPECT command supports surface analysis and alternate block assignment. REFORMAT allows the volume serial and volume owner in the volume label to be updated.

The INIT command now supports 3310 and 3370 minidisks at the minimal level. This support initializes the volume labels and the FBA VTOC. No surface checking or alternate block assignment is supported. 3310 and 3370 minidisk support is valid in the stand-alone environment only. See "Appendix B. Minidisk Support" on page 95 for details of minidisk support.

MACRO CHANGES

The 3310 and 3370 FBA volumes can be used by the INIT, INSPECT, and REFORMAT commands.

A new parameter FBAVTOC has been added to the INIT command. FBAVTOC allows you to specify the starting location, size, and control interval size of an FBA VTOC.

OTHER CHANGES

"Appendix F. The Fixed Block Architecture VTOC (FBAVTOC)" has been added.

"Appendix G. Surface Analysis" has been added.

Updates have been made throughout "Appendix C. Device Support Facilities Messages (ICK)."

RELEASE 4.0

NEW SUPPORT

The IBM 3375 is now supported in the stand-alone, OS/VS1, and OS/VS2 MVS environments.

For the IBM 3375 and 3380, skip displacement can now be performed. Device Support Facilities will skip over defects on a track in lieu of assigning an alternate track. Skip displacement is performed by the INIT command at the maximal level if an error is encountered, and by the INSPECT command when you specify CHECK with TRACKS.

CHANGES TO COMMANDS

The DEVICETYPE parameter has been deleted from the ANALYZE, MAPALT, and REFORMAT commands. With the INIT and INSPECT commands, the DEVICETYPE parameter is only required when you use these commands with the MIMIC(MINI) or MIMIC(EMU) option.

OTHER CHANGES

In the stand-alone environment, you can identify the input and/or output device to ICKDSF by specifying CARD or PRNT instead of the actual device. ICKDSF then selects the appropriate input and/or output device respectively.

Updates have been made throughout "Appendix C. Device Support Facilities Messages (ICK)" on page 96.

Editorial updates have been made throughout.

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PART 1. GENERAL INFORMATION

INTRODUCTION

Device Support Facilities is a program used with IBM System/370 operating systems to perform various operations on direct-access storage devices. It can initialize a direct-access storage volume so that it can be used in an OS/VS or a DOS/VSE system, inspect a volume for defective tracks, reformat the volume label and IPL bootstrap and program records, and examine a device with a nonremovable storage mechanism to determine if there are problems with the drive or with reading or writing data stored on the volume.

Device Support Facilities operates under OS/VS1, OS/VS2 MVS, and DOS/VSE, and as a stand-alone program under a native or VM/370 virtual machine environment.

Device Support Facilties supports the following devices:

- 2305 Fixed Head Storage Models 1 and 2 (2305-1, 2305-2)
- 2311 Disk Storage Model 1 (2311)
- 2314 Direct Access Storage Facility (2314)
- 2319 Disk Storage Models A1, A2, and A3 (2319)
- 3310 Direct Access Storage (3310)
- 3330 Disk Storage Models 1 and 2 (3330)
- 3330 Disk Storage Model 11 (3330-11)
- 3330V MSS 3330 Virtual Volume
- 3333 Disk Storage and Control Models 1 and 11 (3330, 3330-11)
- 3340 Direct Access Storage Facility (3340)
- 3344 Direct Access Storage (3344)
- 3350 Direct Access Storage (3350)
- 3370 Direct Access Storage (3370)
- 3375 Direct Access Storage (3375)
- 3380 Direct Access Storage (3380)

See Figure 2 for information on devices supported by specific Device Support Facilities commands.

SURFACE ANALYSIS CONSIDERATIONS

The surface analysis functions performed by Device Support Facilities are not equivalent to the surface analysis which is performed on a volume at the factory.

Marginal defects that exist on the surface of a track cannot be detected consistently by Device Support Facilities because of their intermittent nature. Therefore, different results can be obtained for the same track and/or volume from multiple runs of Device Support Facilities. Also, Device Support Facilities output can differ from other surface analysis products because of different surface checking algorithms. See "Appendix G. Surface Analysis" for more information on surface analysis.

DETERMINING THE LEVEL OF YOUR DEVICE SUPPORT FACILITIES

To check that the level of your documentation matches the level of your code, Device Support Facilities displays the code level at the top line of each page that is printed on the output device. The top line is printed as follows:

```
ICKDSF-xxx DEVICE SUPPORT FACILITIES yyy
```

where:

```
xxx=VS1
    VS2
    DOS
    SA(stand alone)
yyy=Release (for example, 4.0)
```

INSTALLATION INFORMATION

Instructions explaining how to install Device Support Facilities are contained in the program directory shipped with the machine-readable material.

STORAGE REQUIREMENTS

Device Support Facilities requires the following estimated amounts of storage space:

OS/VS1 and OS/VS2 MVS
Main storage: 384K bytes
Auxiliary storage: 200K bytes

DOS/VSE
Minimum partition size of 384K bytes

Stand Alone
For all devices except 3375 and 3380, 332K bytes are required. For the 3375 and 3380, 384K bytes are required.

FIXED BLOCK ARCHITECTURE DEVICES

Where the term fixed block architecture is used in this book, it refers to the following devices:

- 3310
- 3370

DEVICE SUPPORT FACILITIES COMMANDS

Device Support Facilities has six commands, ANALYZE, BUILDIX, INIT, INSPECT, MAPALT, and REFORMAT. The ANALYZE, INIT, INSPECT, and REFORMAT commands are used with both fixed block architecture and count key data devices. The BUILDIX command is used with count key data devices. The MAPALT command is used with fixed block architecture devices.

- ANALYZE is used for nonremovable storage media to determine if there are any problems with the drive or with reading the user data recorded on the volume.

- BUILDIX changes a standard OS format VTOC to an indexed VTOC, or it can change an indexed VTOC to an OS/VS VTOC.

- INIT initializes a direct-access storage volume so that it can be used in an operating system environment or it reinitializes a volume that was previously initialized.

- INSPECT inspects a previously initialized volume for defective blocks or tracks.

- MAPALT produces a report showing the assignment of primary blocks to alternate blocks on fixed block architecture devices.

- REFORMAT reformats a previously initialized volume. For count key data devices, the volume label, IPL bootstrap, and IPL program records are reformatted. For fixed block architecture devices, the volume label is reformatted.

Figure 1 displays these commands and indicates the operating systems each command supports.

Figure 2 displays the commands and indicates the devices each command supports. It also indicates which devices have fixed block architecture (FBA). In both figures, an X denotes support and a hyphen (-) denotes nonsupport. Sections following the figures give an overview of the commands.

	ANALYZE	BUILDIX	INIT	INSP	MAPALT	RFMT
STAND/ALONE	X	-	X	X	X	X
DOS/VSE	X	-	X	X	X	X
VS/1	X	X	X	X	-	X
MVS	X	X	X	X	-	X

Figure 1. Operating Systems Supported by ICKDSF Commands

	ANALYZE	BUILDIX	INIT	INSP	MAPALT	RFMT
2305	-	X	X	X	-	X
2311	-	-	X	X	-	X
2314	-	-	X	X	-	X
2319	-	-	X	X	-	X
3310 [FBA]	X	-	X	X	X	X
3330-1	Emulated	X	X	X	-	X
3330-11	Emulated	X	X	X	-	X
3330V	-	X	X	X	-	-
3333	Emulated	X	X	X	-	X
3340	Emulated	X	X	X	-	X
3344	X	X	X	X	-	X
3350	X	X	X	X	-	X
3370 [FBA]	X	-	X	X	X	X
3375	X	X	X	X	-	X
3380	X	X	X	X	-	X

Figure 2. Devices Supported by ICKDSF Commands

Note that the following devices are supported only in certain environments:

- The 2311, 3310, and 3370 are supported by DOS/VSE and stand-alone.
- The 2305 is supported by OS/VS1, OS/VS2 MVS, and stand-alone.
- The 3330 MSS virtual volume (3330V) is supported by the INIT command in a stand-alone environment when the MIMIC(MINI) parameter is also specified. The 3330V is also supported by the BUILDIX command in the OS/VS1 and OS/VS2 MVS environments.
- The 3375 is supported by OS/VS1, OS/VS2 MVS, and stand-alone.
- The 3380 is supported by OS/VS2 MVS and stand-alone.

CONSIDERATIONS FOR STAGING DEVICES

Before Device Support Facilities can be run against a staging device, and before the drive can be accessed, the device must be in offline real status. See the manual Operator's Library: IBM 3850 Mass Storage System (MSS) Under OS/VS for details of the VARY OFFLINE, TEST command that is used to set up the device for nonstaging access.

ANALYZING A VOLUME WITH NONREMOVABLE STORAGE MEDIA

When error messages indicate a problem with a DASD device having nonremovable storage media, the ANALYZE command can help the user determine whether to continue operating the device or to start the installation's recovery procedures.

Examples of messages that indicate equipment or data problems are:

- In an OS/VS system:

  A supervisor message such as IEA000I ...

- In a DOS/VSE system:

  A DASD error message such as 8121 I ...

ANALYZE is used in an OS/VS or DOS/VSE operating system, or in the stand-alone environment, to examine the storage device to determine if there are drive problems or storage media problems. A drive problem is an equipment failure within the device that prevents data from being written correctly on the storage media or from being read correctly once it has been written. A storage media problem is a failure on the magnetic surface of the device's disk—some of the data can be written and read correctly, other data on the same surface cannot.

ANALYZE examines the device and, based on the sense information returned, determines the type of problem. It then issues the appropriate message.

If ANALYZE does not detect a problem and you continue to have errors in the data read from the drive, you may assume that the condition is either intermittent or results from incorrect data or faulty programming.

Note that ANALYZE helps determine if recovery actions are needed, but does not initiate recovery procedures to repair the drive or its data. It is expected that the user's own data backup and recovery strategy will be provided.

BUILDING AN INDEX FOR THE VOLUME TABLE OF CONTENTS

In OS/VS systems having indexed VTOC programming support, the BUILDIX command can be used to change a standard OS format VTOC on a count key data device to a VTOC with an indexed format. (The abbreviations OSVTOC and IXVTOC, when used in this book, refer to these two formats of the VTOC. These abbreviations are also used in system messages and to designate parameters of the BUILDIX command.)

The BUILDIX command is used to:

- Change an OS format VTOC to an indexed VTOC
- Change the indexed VTOC to an OS format VTOC

"Appendix E. The VTOC Index" on page 157 contains more information about indexed format VTOCs.

INITIALIZING A VOLUME

The INIT command can be used to initialize a direct-access storage volume so that it can be used in an OS/VS or DOS/VSE operating system. Initialization can be at a minimal, medial, or maximal level depending on the device being initialized and the command parameters you specify. Command parameters are discussed in detail in "Part 2. Reference Information."

The INIT command is used to:

- Check the block or track surfaces and assign alternates to defective blocks or tracks
- Reclaim blocks or tracks that were previously flagged defective if the results of surface checking show there are no recording errors
- Write a volume label and reserve space for additional user volume-label records
- Write a volume serial number in the volume label
- Write an owner identification in the volume label
- Initialize a volume table of contents (VTOC) and reserve space for additional entries
- Write IPL bootstrap records and an IPL program (count key data devices only)
- Validate the home address and record 0 for each track (count key data devices only)
- Write an index for the VTOC mentioned above, thereby creating an indexed VTOC (count key data devices only). "Appendix E. The VTOC Index" on page 157 contains more information about indexed format VTOCs.

INSPECTING A VOLUME

After initializing a volume, you can use the INSPECT command to inspect a volume for defective blocks or tracks, to assign alternate blocks or tracks, or to reclaim tracks that were previously flagged defective.

The INSPECT command is used to:

- Conditionally assign alternate blocks or tracks based on the results of surface checks
- Unconditionally assign alternate blocks or tracks
- Conditionally reclaim primary or alternate tracks
- Conditionally reassign alternate blocks or tracks based on results of surface check
- Unconditionally reassign alternate blocks or tracks

MAPPING ALTERNATE BLOCK ASSIGNMENTS

In a DOS/VSE operating system or in the stand-alone environment, the MAPALT command can be used on fixed block architecture direct access storage devices to produce a printed report, or map, showing primary blocks on the device that have alternate blocks assigned. A limited range of blocks to be mapped may be specified, if desired.

MAPALT output includes:

- A summary report showing the number of blocks with alternates assigned.
- An optional detailed report showing the relative block number of the defective primary block, its location on the volume, and the location on the volume of the assigned alternate.
- Diagnostic information, if I/O errors cause interruption of program execution

REFORMATTING A VOLUME

After a volume has been initialized, the REFORMAT command can be used to change the volume serial number, owner identification, and IPL bootstrap and program records. Also, if an IPL program record does not already exist on the volume, one can be added. Only volumes that have been initialized can be reformatted.

The REFORMAT command is used to:

- Write a new volume serial number in the volume label
- Write a new owner identification in the volume label
- For count key data devices, write IPL bootstrap records at cylinder 0, track 0, records 1 and 2, and replace or add an IPL program

DATA SET SECURITY AND PROTECTION

Device Support Facilities commands are used to manage direct-access storage volumes. There is danger of serious damage to data through inadvertent manipulation of a volume. For this reason, it is important to have some means of protecting data. With Device Support Facilities there are several degrees of volume and data set protection.

There are two environments in which Device Support Facilities can execute: in an operating system or in a stand-alone environment. In the OS/VS operating systems, two modes of operation are available: offline and online. In a stand-alone environment, only the offline mode is available. In a DOS/VSE environment, only the online mode is available. Data set security and protection in different environments and with different modes of operation are discussed in the following sections.

Note that the ANALYZE command does not expose data on the volume to unauthorized disclosure, modification, or destruction, since the ANALYZE command does not write on any user data tracks and does not transmit any user data from the device under test.

DATA SET SECURITY AND PROTECTION IN AN OFFLINE MODE (OS/VS) OR IN A STAND-ALONE ENVIRONMENT

Data set security and protection are limited in offline mode or in a stand-alone environment to what is indicated below:

- The VERIFY parameter of the INIT, INSPECT, and REFORMAT commands can be specified to ensure that the volume serial number and owner identification supplied in the command match those found on the volume. If they match, execution of the command continues; if they do not match, execution of the command terminates.

- The PURGE parameter of the INIT command can be specified. Before the command starts processing the volume, the operator is requested to confirm that the contents of the volume can be purged (see message ICK003D in "Appendix C. Device Support Facilities Messages"). If the operator confirms that the volume contents can be purged, they are purged without consideration as to whether the data is contained in unexpired data sets, VSAM data sets, password-protected data sets, or RACF-protected data sets.

DATA SET SECURITY AND PROTECTION IN AN ONLINE MODE (OS/VS)

Because the resources of the operating system are available to Device Support Facilities in an online mode, data set security and protection are greater.

The VERIFY parameter of the INIT, INSPECT, and REFORMAT commands can be specified to ensure that the volume serial number and owner identification supplied in the command match those found on the volume. If they match, execution of the command continues; if they do not match, execution of the command terminates. The VERIFY parameter causes the same result in either online or offline mode (OS/VS environment) or in a stand-alone environment.

The NOPURGE parameter of the INIT command can be specified. Execution of the command terminates if unexpired data sets, password-protected data sets, RACF-protected data sets, or VSAM data sets are found on the volume.

The PURGE parameter of the INIT command or the NOPRESERVE parameter of the INSPECT command can be specified. If unexpired data sets, password-protected data sets, RACF-protected data sets, or VSAM data sets are on the volume, data loss is prevented as follows:

- Unexpired data sets: The operator is requested to confirm that the contents of the volume can be purged (see message ICK001D in "Appendix C. Device Support Facilities Messages"). Only one request is made, regardless of the number of unexpired data sets on the volume. Note that a list of the unexpired data sets is not provided.

- Password-protected data sets: The operator must provide the correct password for each password-protected data set on the volume. If the correct password is not supplied, execution of the command terminates. Note that a data set that is password-protected and unexpired will be purged if the password is supplied, even though the expiration date has not been passed. If a data set is RACF-protected and password-protected, the data set password is bypassed, and only RACF protection is provided.

  Because of the number of requests for passwords, it may be less time-consuming to process the volume on a device that is offline to the operating system.

- RACF-protected data sets: The RACF program determines if the user is authorized to access the volume contents. When the user is authorized for full volume access, the command continues processing. If the user is not so authorized, the command terminates unless the user has authority to access data sets. If the user has data set authorization, the RACF program determines for each data set whether the user is authorized to scratch the data set. If so, the command is executed. Should any data set be found that the user is not authorized to scratch, execution of the command terminates. If a data set is both RACF protected and password protected, the password will be checked only if RACF support is not present in the system. The system operator usually has the authority to bypass RACF checking.

- VSAM data sets: In the online mode, when VSAM data sets exist on the volume, processing terminates and a message is issued. If this volume is to be reinitialized, it is necessary to do so in the offline mode.

AUTHORIZED PROGRAM FACILITY (OS/VS2 MVS ONLY)

The authorized program facility (APF) limits the use of sensitive system services and resources to authorized system and user programs. See "Authorized Program Facility (APF)" in OS/VS2 System Programming Library: Supervisor for information about program authorization.

The Device Support Facilities load module is contained in SYS1.LINKLIB, except module ICKDV05 (IGG019P2), which is contained in SYS1.SVCLIB. The load module (ICKDSF) is link-edited with the SETCODE AC(1) attribute. These two characteristics ensure that Device Support Facilities executes with Authorized Program Facility authorization.

This authorization is established at the task level. If, during the execution of an APF-authorized job step, a load request is satisfied from an unauthorized library, the task will be abnormally terminated. It is the installation's responsibility to ensure that a load request cannot be satisfied from an unauthorized library during Device Support Facilities processing.

If a Device Support Facilities module is loaded from an unauthorized library, the Authorized Program Facility authorization of Device Support Facilities terminates.

DATA SET SECURITY AND PROTECTION (DOS/VSE)

The VERIFY parameter of the INIT, INSPECT, and REFORMAT commands can be specified to ensure that the volume serial number and owner identification supplied in the command match those found on the volume. If they match, execution of the command continues; if they do not match, execution of the command terminates.

The NOPURGE parameter of the INIT command can be specified. Execution of the command terminates if unexpired files, data-secured files, or VSAM files are found on the volume.

The PURGE parameter of the INIT command or the NOPRESERVE parameter of the INSPECT command can be specified. If unexpired files, data-secured files, or VSAM files are on the volume, data loss is prevented as follows:

- Unexpired files: The operator is requested to confirm that the contents of the volume can be purged (see message ICK001D in "Appendix C. Device Support Facilities Messages"). Only one request is made, regardless of the number of unexpired files on the volume. Note that a list of the unexpired files is not provided.

- Data-Secured files: If a file is a data-secured file, message ICK017D prompts the operator with the name of the secured file, and message ICK018D requests permission to purge the file. This sequence is repeated for each data-secured file that exists on the volume.

- VSAM files: If a single VSAM file is found on the volume, permission is requested for the purging of all the VSAM files on the volume (message ICK019D).

PROCESSING IN A SHARED ENVIRONMENT (OS/VS)

The commands INIT, INSPECT, REFORMAT, and BUILDIX require exclusive control of the direct access storage volume. Hence, the device is reserved by issuance of the RESERVE macro to the processor that issued the command. After processing on that device is completed, the DEQ macro is issued to release the device.

PROCESSING IN A SHARED ENVIRONMENT (DOS/VSE)

For all commands, processing continues only after the operator has replied to a console message (ICK020D) granting permission to process on the device that is being shared.

EXECUTING DEVICE SUPPORT FACILITIES

To use Device Support Facilities, you execute the Device Support Facilities command processor. Each command is processed completely before processing of another command begins.

The following sections describe execution of Device Support Facilities in several situations:

- In the stand-alone environment
- In an OS/VS environment
- In a DOS/VSE environment

EXECUTING DEVICE SUPPORT FACILITIES IN A STAND-ALONE ENVIRONMENT

You execute the Device Support Facilities program in a stand-alone environment by loading the program into main storage. The examples in Part 2 of this book illustrate each command's use after the program is loaded.

LOADING THE DEVICE SUPPORT FACILITIES PROGRAM

For OS/VS (both VS1 and MVS), the stand-alone code is found in SYS1.SAMPLIB in ICKSADSF. The Device Support Facilities program is usually loaded from a file on tape, but can be loaded from a binary-card deck.

The following is sample OS/VS JCL that can be used to copy the stand-alone Device Support Facilities code to an unlabelled tape. There should only be one file on the tape. Note that BLKSIZE=80 is required on the tape data set.

```
//JOBNAME   JOB  JOB CARD PARAMETERS
//STEPNAME  EXEC PGM=IEBGENER
//SYSPRINT  DD   SYSOUT=A
//SYSIN     DD   DUMMY,DCB=BLKSIZE=80
//SYSUT1    DD   DSNAME=SYS1.SAMPLIB(ICKSADSF),UNIT=3330,
//               DISP=SHR,VOLUME=SER=XXXXXX,
//SYSUT2    DD   DSNAME=ICKDSF,UNIT=2400-3,LABEL=(,NL),
//               DISP=(,KEEP),VOLUME=SER=YYYYYY,
//               DCB=(RECFM=F,LRECL=80,BLKSIZE=80)
```

In the DOS/VSE environment, the stand-alone code is found in the system source statement library in book Z.DSFSA. You can copy the code to a tape by using the DOS/VSE BACKUP utility. The following shows sample job control statements to copy the stand-alone Device Support Facilities code to a tape.

```
// JOB BUILD A STAND-ALONE TAPE
// ASSGN SYS006,cuu      OUTPUT TAPE FOR STAND-ALONE DSF
// MTC REW,SYS006
// EXEC BACKUP
 SA
/*
/&
```

Because the procedures for loading a program are not the same for all models of processing units, you must load the Device Support Facilities program from the tape unit or card reader according to the procedures for your processing unit. The program contains the instructions necessary to load and store itself in the lower addresses of main storage. When the program has completely loaded, the processor enters the WAIT state. When the processor enters the WAIT state, the program status word (PSW) should contain the following:

```
FF060000 00FFFFFF
```

At this time, you continue by identifying the console, the input device, and the output device.

Identifying the Console

You identify the console to the program by pressing the REQUEST or ENTER key at the console. You must use one of the following consoles:

- 1052 Model 7 Printer-Keyboard
- 3036 Graphics Console
- 3056 Graphics Console
- 3138, 3148, 3158 Consoles in typewriter keyboard mode
- 3210 Models 1 and 2 Console Printer-Keyboard
- 3215 Model 1 Console Printer-Keyboard
- 3277-2 Graphics Console
- 3278-2A Graphics Console

Identifying the Input Device

After you have identified the console, message ICK005E prompts you to specify the input device and its address. See Appendix C for the full message text. You must use one of the following input devices:

- 1052 Model 7 Printer-Keyboard
- 1442 Model N1 Card Read Punch, Model N2 Card Punch
- 2501 Models B1 and B2 Card Reader
- 2520 Model B1 Card Read Punch, Models B2 and B3 Card Punch
- 2540 Model 1 Card Read Punch
- 2560 Multifunction Card Machine
- 3210 Models 1 and 2 Console Printer-Keyboard
- 3215 Model 1 Console Printer-Keyboard
- 3504 Models A1 and A2 Card Reader
- 3505 Models B1 and B2 Card Reader
- 3525 Card Punch (with card-read feature)
- 5424 Card Punch (80 columns only)
- 5425 Multifunction Card Unit (80 columns only)

You can specify the word CARD or one of the device types listed above or you can specify the console as the input device by entering CONSOLE in response to message ICK005E. When the console is the input device, you are prompted to enter the next line by 'ENTER INPUT/COMMAND'.

Identifying the Output Device

After you respond to message ICK005E, message ICK006E prompts you to specify the output device and its address. See Appendix C for the full message text. You must use one of the following output devices:

- 1052 Model 7 Printer-Keyboard
- 1403 Models 2, 7, and N1 Printer
- 1443 Model N1 Printer
- 3203 Models 1, 2, 4, and 5 Printer
- 3210 Models 1 and 2 Console Printer-Keyboard
- 3211 Model 1 Printer
- 3215 Model 1 Console Printer-Keyboard
- 3800 Printing Subsystem
- 3262 Line Printer
- 3289 Model 4 Printer
- 5203 Model 3 Printer

You can specify the word PRNT or one of the devices listed above or you can specify the console as the output device by entering CONSOLE in response to message ICK006E.

Specifying the Date and Time of Day

The date and time of day are automatically picked up from the TOD (time of day) clock of the processing unit. Note that the TOD clock would typically indicate Greenwich Mean Time, and this would be reflected in any listings.

In the event that the TOD clock is in error or not set, message ICK015E prompts you to enter the date. Then, message ICK016E prompts you to enter the time of day. In response to these messages, you can enter any string of up to 8 characters. These will appear in the title line of the output. On the other hand, you can press the ENTER key without specifying a date or time of day. In this case, the time of day and date are set to zeros. Note that these messages can appear again if a VTOC entry has to be created for a data set. It is necessary to furnish the information each time it is requested if the VTOC entry is to be correct.

ERROR CONDITIONS

The stand-alone version of Device Support Facilities requires 384K bytes of real storage to execute successfully. In the event that the real storage available for Device Support Facilities is not sufficient, all the input is read and an error condition is posted in the PSW. This error condition is:

```
00020000 33222222
```

A PSW code of

```
00020000 22222222
```

indicates that a unit check occurred on the IPL device during the IPL.

The PSW indicates the cause of errors that may occur when processing Device Support Facilities in a stand-alone environment. The processor is placed in a WAIT state and the PSW contains the following:

```
FF060000 00EEEEnn
```

Values of nn indicate the type of error:

- X'13' indicates an SVC interrupt
- X'14' indicates a program interrupt
- X'15' indicates insufficient main storage
- X'16' indicates an I/O error
- X'17' indicates data set not open
- X'18' indicates console not defined
- X'19' indicates no end-of-data routine

PROGRAM TERMINATION

Execution of the Device Support Facilities program terminates in a stand-alone environment when the end of the command input stream is encountered. If the console was specified as the input device, you enter the characters EOF in response to a request for the next command. When the execution terminates, the processor is placed in a WAIT state, and the PSW should contain the following:

```
FF060000 00EEEEzz
```

where zz indicates the highest decimal condition code encountered during execution as shown by the hexadecimal values that appear next. See "Condition Codes to Control Command Execution" later in this chapter for an explanation of condition codes.

- X'00' indicates 0
- X'04' indicates 4
- X'08' indicates 8
- X'0C' indicates 12
- X'10' indicates 16

EXECUTING DEVICE SUPPORT FACILITIES IN OS/VS

In the OS/VS environment you execute Device Support Facilities as a job or job step. The examples in Part 2 of this book illustrate each command's use by obtaining the processor using OS/VS JCL statements.

You identify the Device Support Facilities processor when you state PGM=ICKDSF in the EXEC statement.

```
//JOBNAME   JOB   YOUR INSTALLATION'S JOB-ACCOUNTING DATA
//JOBCAT    DD    DSNAME=YOUR.CATALOG,DISP=SHR
//STEP1     EXEC  PGM=ICKDSF
//MYVOL     DD    UNIT=(devicetype),DISP=OLD,VOL=SER=VOL123
//STEPCAT   DD    DSNAME=ANOTHER.CATALOG,DISP=SHR
//SYSPRINT DD     SYSOUT=A
//SYSIN     DD    *
  Device Support Facilities commands
/*
```

JOB CONTROL LANGUAGE EXPLANATION

1. //JOBNAME is required. The JOB statement describes your job to the OS/VS system. Procedures at your installation may require you to supply user identification, accounting, and authorization information with the JOB statement's parameters.

2. //JOBCAT is optional. The JOBCAT DD statement identifies a user catalog that can be used by each of the job's steps. If your job uses only the master catalog, do not specify the JOBCAT DD statement since the master catalog is always open and available to all the jobs on the system.

3. //STEP1, an EXEC statement, is required. The EXEC statement invokes the Device Support Facilities processor to process the Device Support Facilities commands.

4. //STEPCAT is optional. The STEPCAT DD statement identifies a user catalog that can be used when processing the job step. If user catalogs are identified with JOBCAT and STEPCAT DD statements, only the catalog identified with the STEPCAT DD statement and the master catalog are used with the job step. If your job step uses only the master catalog, do not specify the STEPCAT DD statement, because the master catalog is always open and available to all the jobs on the system.

5. //SYSPRINT is required. The SYSPRINT DD statement identifies the output data set that Device Support Facilities sends messages and output information to. (See "Output Data Sets" later in this chapter for more information on how to describe an output device other than SYSOUT=A.)

6. //SYSIN is required. The SYSIN DD statement identifies the source of the input statements. An input statement to Device Support Facilities is a command. When you code SYSIN DD *, you identify the statements that follow as input.

7. The last input statement is followed by /* in the first two columns of the next input record.

PRINTED OUTPUT DATA SET

The normal printed output data set is SYSPRINT. The default parameters for this data set are:

- Record format of VBA
- Logical-record length of 125 (121 + 4)
- Block size of 629 (5 x (121 + 4) + 4)

The first byte is the ANSI control character. The minimum specifiable logical-record length (LRECL) is 121 (U-format records only). If a smaller size is specified, it will be overridden to 121.

You can alter the above defaults by specifying the desired values in the DCB parameter of the SYSPRINT statement. However, the record format cannot be specified as F or FB. If you specify either of these, it will be changed to VBA.

EXECUTING DEVICE SUPPORT FACILITIES IN DOS/VSE

You execute Device Support Facilities as a job. The examples in Part 2 of this book illustrate each command's use by obtaining the processor with system control statements. You identify Device Support Facilities in the EXEC statement by stating EXEC ICKDSF.

```
// JOB      jobname   YOUR INSTALLATION'S JOB-ACCOUNTING DATA
// ASSGN    SYS010,353
// EXEC     ICKDSF,SIZE=AUTO
   Device Support Facilities commands
/*
/&
```

SYSTEM CONTROL STATEMENTS EXPLANATION

1. // JOB is an optional statement used to describe your job to the DOS/VSE system.

2. // ASSGN causes the SYSNAME SYS010 to be assigned to the device whose channel and unit address is 353.

3. /* appears in the first two columns of the input record following the last input statement.

4. /& appears in the first two columns of the input record following the /* card to indicate end of job.

PRINTED OUTPUT

All printed output is directed to SYSLST.

CONTROLLING COMMAND EXECUTION

Command execution can be controlled by the statements that follow:

- The **IF-THEN-ELSE** statement sequence tests a condition code and controls execution of subsequent commands according to the results of the test. The IF statement is followed by THEN and ELSE clauses, which specify alternative actions. DO and END statements are optionally part of THEN and ELSE clauses and specify the beginning and ending of a statement sequence when you want to specify more than one Device Support Facilities command with either a THEN or an ELSE clause.

- The **SET** statement sets condition codes.

CONDITION CODES TO CONTROL COMMAND EXECUTION

The condition codes compared in the IF-THEN-ELSE statement sequence are LASTCC and MAXCC, which take the following values:

0

indicates that the command was executed as specified. Some informational messages may have been issued.

4

indicates that some problem was met while executing the complete command, but Device Support Facilities processing continued. The continuation might not provide the user with exactly what was wanted, but no data or volume has been permanently harmed. A warning message was issued. An example of the kind of problem encountered is: the system ignored a parameter that was specified but did not apply.

8

indicates that a requested command was completed, but some actions were unavoidably bypassed. For example, Device Support Facilities was unable to reclaim an alternate track.

12

indicates that the requested command could not be executed. This condition code is a result of a logical error or a problem during execution. A logical error exists, for example, when inconsistent parameters are specified, when a too-small or too-large value is specified, or when required parameters are missing. A problem during execution exists when the volume label cannot be changed.

16

indicates a severe error occurred, causing the remainder of the command stream to be flushed. For example, this condition code might be a result of the following: the system output data set could not be opened (the SYSPRINT DD statement was missing, perhaps); an unrecoverable error occurred in a system data set; or Device Support Facilities encountered improper IF-THEN-ELSE statement sequences.

IF-THEN-ELSE STATEMENT SEQUENCE

You use the IF-THEN-ELSE statement sequence to control command execution. The syntax of the IF-THEN-ELSE statement sequence is:

<table>
<tr><td rowspan="3">IF</td><td>{<b>LASTCC</b> comparison operator
condition code |
<b>MAXCC</b> comparison operator
condition code}</td></tr>
<tr><td><b>THEN</b> [command |
<b>DO</b>
command
<b>END</b>]</td></tr>
<tr><td>[<b>ELSE:</b> [command |
<b>DO</b>
command
<b>END</b>]]</td></tr>
</table>

where:

IF specifies that one or more Device Support Facilities commands are to be executed based on a test of a condition code value. The condition code was set by a SET command or reflects the completion status of previous Device Support Facilities commands.

LASTCC _comparison operator condition code_ specifies that the condition code value resulting from the immediately previous Device Support Facilities command is to be compared to the condition code indicated by the _comparison operator_ to determine whether the THEN or ELSE action is to be performed. See "Condition Codes to Control Command Execution" earlier in this chapter for the explanation of condition codes.

For _comparison operator_, substitute one of the following six comparison operators to compare the condition code resulting from the previous Device Support Facilities command and the condition code you specified in the IF statement:

- Equal, specified as = or EQ
- Not equal, specified as ¬= or NE

- Greater than, specified as > or GT

- Less than, specified as < or LT

- Greater than or equal, specified as >= or GE

- Less than or equal, specified as <= or LE

For condition code, substitute the decimal number, up to ten digits long, that is to be compared with LASTCC. Condition codes greater than 16 are reduced to 16. See "Condition Codes to Control Command Execution" earlier in this chapter for the explanation of condition codes.

MAXCC comparison operator condition code specifies that the maximum condition code value resulting from any previous Device Support Facilities command or a SET command is to be compared to the condition code indicated by the comparison operator to determine whether the THEN or ELSE action is to be performed. See "Condition Codes to Control Command Execution" earlier in this chapter for the explanation of condition codes.

For comparison operator, substitute one of the following six comparison operators to compare the maximum condition code resulting from any Device Support Facilities command and the condition code you specified in the IF statement:

- Equal, specified as = or EQ

- Not equal, specified as ¬= or NE

- Greater than, specified as > or GT

- Less than, specified as < or LT

- Greater than or equal, specified as >= or GE

- Less than or equal, specified as <= or LE

For condition code, substitute the decimal number, up to ten digits long, that is to be compared with MAXCC. Condition codes greater than 16 are reduced to 16. See "Condition Codes to Control Command Execution" earlier in this chapter for the explanation of condition codes.

THEN specifies that a single command (or a group of commands introduced by DO) is to be executed if the comparison is true. THEN can be followed by another IF statement.

ELSE specifies that a single command (or a group of commands introduced by DO) is to be executed if the comparison is false. ELSE can be followed by another IF statement.

When an IF statement appears in a THEN or ELSE clause, it is called a nested IF statement. The maximum number of nested levels allowed is 10, starting with the first time you specify IF.

Within nested IF statements, the innermost ELSE clause is matched to the innermost THEN clause, the next innermost ELSE clause is matched to the next innermost THEN clause, and so on. In other words, each ELSE clause is matched to the nearest preceding unmatched THEN clause. If there is an IF statement that does not require an ELSE clause, follow the THEN clause with a null ELSE clause, unless the nested structure does not require one.

DO command can be specified with the THEN and ELSE clauses to indicate that the group of commands following are to be treated as a single unit, that is, to be executed as a result of a single IF statement. Commands following a DO must begin on a new line. The group of commands is terminated by END.

For command, substitute the Device Support Facilities command that you want to process as a result of a single IF statement.

END specifies the end of a group of Device Support Facilities commands initiated by the nearest unended DO. END must be on a line by itself.

NULL THEN AND ELSE CLAUSES

When a THEN or ELSE clause is not followed by a continuation character or by a command in the same record, it results in no action.

For example, to specify a null THEN clause when you want a Device Support Facilities command to execute if the IF statement is false, you specify THEN without a continuation character or Device Support Facilities command. On the next line, specify ELSE followed by a Device Support Facilities command. If you want to specify a null THEN clause, specify:

```
IF ...
 THEN
 ELSE ...
```

If you want to indicate a null ELSE clause, specify:

```
IF ...
 THEN ...
 ELSE
```

SET STATEMENT

The SET statement sets a condition code. See "Condition Codes to Control Command Execution" earlier in this chapter for the explanation of condition codes. You can terminate all processing simply by setting MAXCC or LASTCC to 16.

The syntax of the SET statement is:

SET	{**LASTCC** = condition code| **MAXCC** = condition code}

where:

SET specifies that a condition-code value is to be set. If a SET statement is specified following a THEN or ELSE clause, and the clause is not executed because the comparison in the IF statement does not allow the clause to execute, the condition code specified with LASTCC or MAXCC is not set.

LASTCC = condition code specifies that the condition code to be set is the condition code set by the immediately previous Device Support Facilities command.

For condition code, substitute a decimal number, up to ten digits long, that is to be assigned to LASTCC. Condition codes greater than 16 will be reduced to 16. If the condition code assigned to LASTCC is a greater value than the condition code assigned to MAXCC, MAXCC assumes the condition code assigned to LASTCC.

MAXCC = condition code specifies that the condition code to be set is the maximum condition code. Setting MAXCC does not affect the condition code for LASTCC.

For condition code, substitute a decimal number, up to ten digits long, that is to be assigned to MAXCC. Condition codes greater than 16 will be reduced to 16.

Continuation Lines

Use continuation lines cautiously when specifying IF-THEN-ELSE statements, SET statements, comments, or blank records in the input stream. Blank records or records ending with comments must end with a continuation mark when you specify these types of records in the middle of a command or between the THEN and ELSE clauses of an IF statement. Always specify a continuation mark when records end with partial comments. (See "Line Continuations" on page 23 and "Comments" in Part 2.)

You must be careful when you continue IF-THEN-ELSE statements so that you don't inadvertently specify a null THEN or ELSE clause. For information on this subject, see "Null THEN and ELSE Clauses" earlier in this chapter.

EXAMPLES OF STATEMENTS TO CONTROL COMMAND EXECUTION

The examples that follow show the use of the IF-THEN-ELSE statement sequence and the SET statement.

IF-THEN-ELSE Statement: Example 1

```
INIT DDNAME(VOLXYZ) VERIFY(VOLABC)
  IF LASTCC=0-
    THEN REFORMAT DDNAME(VOL293) VOLID(SYX1) NOVERIFY
    ELSE REFORMAT DDNAME(VOL123) VOLID(SYX2) NOVERIFY
```

SET Statement: Example 2

```
SET LASTCC=8
```

PART 2. REFERENCE INFORMATION

This part of the book is to be used as a reference when you code the Device Support Facilities commands. The commands are arranged in alphabetic order. The presentation of each command includes:

- A general description of the command and its use
- A table summarizing the syntax of the command
- An explanation of required and optional parameters
- Examples

SYNTAX OF THE DEVICE SUPPORT FACILITIES COMMANDS

The illustrations of command formats in this book use the following conventions:

- Brackets ([]) indicate an optional field or parameter.
- Braces ({}) indicate that one of alternative items must be selected.
- Items separated by a vertical bar (|) represent alternative items. Only one item may be selected.
- An ellipsis (•••) indicates that multiple entries of the type immediately preceding the ellipsis are allowed.
- **Boldface** type indicates the exact characters to be entered. Such items must be entered as shown or in the abbreviated form allowed.
- Underscored uppercase type indicates a default option. If the parameter is omitted, the default value is assumed.
- Underscored lowercase or lowercase type indicates fields to be supplied by you.
- Parentheses, commas, slashes, spaces, and other punctuation must be entered as shown.
- Numeric parameters can be coded in two ways: decimal or hexadecimal (X'n'). This applies to any parameter that specifies a substitution of decimal numbers.
- Character string parameters can be coded either with or without enclosing them in single quotation marks. However, if delimiters such as commas, blanks, or parentheses appear within a character string, the string must be enclosed within single quotation marks.

You can specify values with some keyword parameters. The value is entered within parentheses following the keyword parameter. A typical keyword with a value appears in this book as:

VOLID(serial)

A value cannot contain commas, semicolons, blanks, parentheses, or slashes unless the entire value is enclosed within single quotation marks. (A single quotation mark in a field enclosed within quotation marks must be coded as two single quotation marks.)

Positional Parameters: In the explanations of commands within this book, the positional parameters are shown in lowercase underscored letters or lowercase letters. When a positional parameter consists of a list of items, you must enclose the list in parentheses.

ABBREVIATING COMMANDS AND PARAMETERS

Some of the commands and parameters can be abbreviated. Abbreviations for commands are listed just before the syntax of the command is shown. Abbreviations for parameters are shown with the heading "Abbreviations." The full form of the parameter is given first, then acceptable abbreviations. A vertical bar is used to separate the parameter and its abbreviations.

DELIMITERS

When you issue a command, you must separate the command name from the first parameter by one or more blanks. You must separate parameters from each other by one or more blanks or a comma. Do not use a semicolon as a delimiter because any characters that follow a semicolon are ignored.

LINE CONTINUATIONS

A command, IF statement, or comment can be entered using one or more lines. To continue a command or comment that requires more than one line, each line, except the last, must be terminated by a plus or minus sign in the last nonblank column at or before column 72. The minus sign causes leading blanks in the following line to be read as part of the command. The plus sign causes leading blanks in the following line to be ignored.

COMMENTS

You can add comments to any of the commands wherever a blank character can appear. To distinguish your comments from the commands, enter them within the comment delimiters /* and */. A comment may be continued to the next line by using a line continuation character at the end of the line.

TERMINATOR

The terminator indicates the end of the command. The terminator can be either an end-of-command condition (that is, no continuation mark) or a semicolon. If you use the semicolon as the terminator, the semicolon cannot be enclosed in quotation marks or embedded in a comment. Everything to the right of the semicolon is ignored. If there is information to the right of the semicolon that is continued to another record, all the information including the continued information is ignored.

For example, if you code:

```
REFORMAT UNITADDRESS(353) VOLID(AA2314); VFY(BB2314,SMITH) -
INIT ...
REFORMAT ...
```

characters following the semicolon terminator are ignored. The continuation mark (minus sign) at the end of the second record causes the INIT command to be ignored also. The two REFORMAT commands are the only commands that are recognized.

USING THE DEVICE SUPPORT FACILITIES COMMANDS

A command consists of a command name followed by one or more operands or parameters. Hereafter, all operands described in this book are called parameters. They provide the specific information required for the command to perform the requested function.

For example, some parameters associated with the INSPECT command indicate where the volume is mounted, the tracks that are to be inspected, and the verification of volume serial number and owner identification.

The following is an example of this command:

```
INSPECT DDNAME(VOL1) TRACKS((4,6),(4,10)) VERIFY(DSF123,SMITH)
```

where:

- DDNAME specifies the DD statement that contains the description of the device.

- TRACKS specifies that cylinder 4, tracks 6 and 10 are to be inspected.

- VERIFY specifies that volume serial number DSF123 and owner identification SMITH are to be verified before inspection continues.

Several of the parameters take default values if they are not specified when the command is issued. In the foregoing example, the following parameters were not specified, but are defaulted:

- CHECK(1) indicates that track surfaces are checked for recording errors.

- NORECLAIM indicates that no attempt is made to reclaim tracks that were previously flagged defective.

- PRESERVE indicates that existing data on the inspected tracks is saved and rewritten.

- MAP indicates that a volume map is printed after the command processes.

- ASSIGN indicates that alternate tracks are assigned for the specified tracks if they are shown to be defective as a result of surface checking.

Note: When using an 80-column card format, the Device Support Facilities commands must be entered within columns 2 and 72. If the length of the command exceeds column 72, a continuation mark must be entered, and the command continued on the next line. When commands are entered at the console in a stand-alone environment, they can begin at the left margin and are also subject to the 72-column maximum. If conflicting keyword parameters are entered, execution of the command terminates.

Conflicting keyword parameters are identified by a logical OR sign (|) representing alternative items.

ANALYZE: ANALYZING A VOLUME

The ANALYZE command is for use with IBM direct-access storage devices (DASD) that have nonremovable storage media. ANALYZE examines the drive and the user's data to determine if there are errors. When ANALYZE detects an error, it prints a message to the operator and prints diagnostic information on the system's printer.

ANALYZE only supports those devices which have nonremovable storage media. ANALYZE provides the user with the tool needed to determine whether the error is caused by the pack (that is, the storage medium) or by the drive; and whether to start data recovery procedures, or to call a customer engineer or service representative. ANALYZE also provides output that assists in locating and fixing the problem.

USING ANALYZE OUTPUT

As part of an installation's operating procedures, ANALYZE output can assist in determining whether or not recovery procedures can or should be executed. However, the use of ANALYZE output by customer engineers or service representatives to isolate and to repair drive malfunctions should not replace the use of more detailed diagnostic tools and procedures available for that purpose. ANALYZE output in such instances should serve only as the initial reference material that shows the final problem symptom but does not specifically isolate the problem source.

ANALYZE can determine whether the device to be tested is a nonremovable storage medium device or not. If the device to be tested is a 3350, ANALYZE also determines whether the logical volume is in native mode or one of the compatibility modes. If an attempt is made to execute ANALYZE against a device other than one with nonremovable storage media, ANALYZE issues an error message to the operator and processing terminates.

Two basic tests are performed by ANALYZE—the drive test and the data verification test. The drive test is a general exercising of the storage device by issuing SEEK, READ, and WRITE commands. From the results of issuing these commands, ANALYZE determines the drive's ability to perform expected actions.

Note: WRITE commands are only issued when the read/write head is positioned in the CE cylinder. If the drive test is completed successfully, the data verification test, which is optional, can then be performed. The data verification test reads (without data transfer across the channel to the CPU) to the maximum of every user data record on the logical volume. This determines whether the data can be read correctly—that is, without uncorrectable data check errors. (A logical volume is a portion of a physical volume that is viewed by the system as a volume.)

In addition, a data verification option is provided that allows you to specify a portion of the volume for testing. For the supported count key data devices, one or more cylinders can be specified. For the supported fixed block devices, one or more blocks can be specified. You may also perform data verification for the entire volume.

ANALYZE does not require exclusive control of the drive under test. Most of ANALYZE's CCW chains (that is, its channel programs) do not hold the drive busy for longer than 0.5 second. However, if the operating system executes its error recovery procedures as a result of I/O errors detected during ANALYZE processing, the error recovery procedures may hold the drive busy for a longer period of time.

ANALYZE data verification testing allows you to control the duration of each EXCP by specifying either SPEED or NOSPEED. This controls the duration of each EXCP as follows:

- For the supported count key data devices, one EXCP per track is issued when NOSPEED is specified. When SPEED is specified, there is one EXCP issued for each cylinder.
- For the supported fixed block devices, if NOSPEED is specified, one EXCP is issued (to read 32 and 248 blocks respectively). When SPEED is specified, one EXCP is issued to read 352 and 748 blocks respectively.

ANALYZE supports the 3310 and 3370 devices in fixed block mode only. This mode is based on data transfers of 512-byte increments (blocks) for storing and retrieving data.

Assumptions

When you run ANALYZE, the following conditions are assumed to exist:

- The home address on each track in the user area is correct and readable.
- The part of the CE cylinder that is written on by ANALYZE is free from defects. Also, the home address on each track in the CE cylinder is correct and readable.
- All records on the logical volume's track in the user area have been written in a format consistent with the IBM standard record format.
- The 3310 and 3370 data fields have been previously initialized (all data fields written).

WHAT ANALYZE TESTS

When an error occurs, the device (and its storage control unit) usually corrects the error and doesn't notify the operator or programmer that an error occurred. Under OS/VS, such errors are recorded by the operating system's error-recovery procedures (ERP). Data about those errors is available in the system's error log and printout, which is usually examined by the installation's system programmer and by the customer engineer or service representative who serves the installation. Under DOS/VSE, system error-recovery procedures are bypassed, and ANALYZE does its own sense analysis. Senses are printed by Device Support Facilities on SYSLST.

Errors that are more persistent and that cannot be corrected by the device's internal error-correction circuitry result in messages to the operator on the system console and on the output printer. Also, data errors may occur that cause a user to suspect a drive failure rather than a programming error. The three types of drive failures are drive errors, media errors (problems with the disk surface), and data format errors (the data is written in a format not consistent with the IBM standard format). ANALYZE performs two testing procedures to detect errors—the drive test and the data verification test.

The Drive Test

ANALYZE first determines the drive is fully operational by performing I/O operations that test the drive's functional capabilities. Each I/O operation, called a channel command word (CCW) chain, tests a specific function of the drive and logical volume. Tests are executed in order of increasing complexity.

Drive problems that can be detected during ANALYZE's initial tests are access arm positioning errors and the ability to read and write (in the CE cylinder). For the 3344 and 3350, the drive is also checked to ensure that it can detect an address mark, can switch read/write heads as a result of a multitrack command, can sense the disk's rotational position, and can detect and skip over defective areas on a track.

The Data Verification Test

If ANALYZE completes all drive tests without error, the data verification test can be run. The ANALYZE data verification test determines the status of the drive's storage medium by reading (without data transfer to the processor) to the maximum of all data records on the volume. If a data check is detected during the test, both the address and the cylinder and head number or relative block number are noted in a diagnostic message on the printer. When a track or block is found to be defective, you can bypass the defect by assigning an alternate track or block to replace it.

ANALYZE allows you options for the data verification tests:

- You may specify data verification of the whole volume.
- You may select a range of data to be verified either by cylinders or by blocks.
- You may also select the SPEED or NOSPEED parameter or the data verification tests.

  SPEED specifies:

  - Perform one EXCP per cylinder for the count key data devices.
  - Perform one EXCP for the maximum number of blocks (352 and 744 respectively) within the range specified for the 3310 and 3370.

  NOSPEED specifies:

  - Perform one EXCP per track for the count key data devices.
  - For the 3310 and 3370 the number of blocks read by each EXCP is 32 and 248 respectively.

Note: When errors other than data check occur during the data verification test, the errors may be identified by ANALYZE as data check errors. When you examine the sense information, however, you can determine whether the error is actually a data check or an intermittent or marginal drive error.

SYNTAX

<table>
<tr><th>Command</th><th>Required Parameters</th></tr>
<tr><td rowspan="3">ANALYZE</td><td>UNITADDRESS(cuu)|
DDNAME(dname)|
SYSNAME(sysxxx)</td></tr>
<tr><td>Optional Parameters</td></tr>
<tr><td>SCAN|NOSCAN
LIMITS(scanlo,scanhi)|ALL
SPEED|NOSPEED
MSS</td></tr>
</table>

UNITADDRESS|DDNAME|SYSNAME: IDENTIFYING THE DEVICE ON WHICH THE VOLUME IS MOUNTED

Explanation: UNITADDRESS(cuu)|DDNAME(dname)|SYSNAME(sysxxx) are required parameters identifying the volume that is to be analyzed.

UNITADDRESS

Required when analyzing a volume that is mounted offline or when analyzing a volume in a stand-alone environment.

For cuu, specify the address in hexadecimal of the channel and unit on which the volume is mounted.

Note: The device must be on a channel that is online. If the device is on a channel that is offline, the program may enter a nonterminating wait state.

DDNAME

Required when analyzing a volume that is mounted online. The device on which the volume is mounted must be online.

For dname, specify the OS/VS JCL statement that identifies the device on which the volume is mounted.

SYSNAME

Required when analyzing a volume in the DOS/VSE environment. For sysxxx, specify the SYSNAME in the ASSGN system control statement.

Abbreviations:

UNITADDRESS|UNITADDR|UNIT
DDNAME|DNAME

Defaults: None

Restrictions: The DDNAME or SYSNAME parameter cannot be specified when analyzing a volume in a stand-alone environment.

SCAN|NOSCAN: RUN DATA VERIFICATION TESTS

Explanation: SCAN|NOSCAN are optional parameters specifying whether the data verification tests are to be run after successful completion of the drive tests.

SCAN

Indicates that you want the data verification tests to be run after successful completion of the drive tests.

NOSCAN
Indicates that you do not want the data verification tests to be run after successful completion of the drive tests.

Abbreviations:

SCAN|SCN
NOSCAN|NOSCN|NSCAN|NSCN

Default: NOSCAN

Restrictions: None.

LIMITS: SPECIFYING THE AREA OF DATA VERIFICATION

Explanation: **LIMITS(scanlo,scanhi)|ALL** are optional parameters to specify the area of the disk where data verification is to be performed. For fixed block devices, you specify the range of blocks to be read during the data verification tests. For count key data devices, you specify the range of cylinders that are to be read during the data verification tests.

LIMITS(scanlo,scanhi)
scanlo specifies, for fixed block devices, the relative block number for the start of the data verification tests. For count key data devices, scanlo specifies the relative cylinder number for the start of the data verification tests. scanlo can be expressed in decimal (n) or hexadecimal (X'n') form.

scanhi specifies, for fixed block devices, the relative block number of the last block of the data verification tests. For count key data devices, scanhi specifies the relative cylinder number of the last cylinder of the data verification tests. scanhi can be expressed in decimal (n) or hexadecimal (X'n') form.

Note: For fixed block devices, a rounding algorithm is used to calculate, depending on whether the SPEED or NOSPEED option is chosen, the optimum number of blocks to be read for each EXCP. (This optimum number of blocks takes advantage of certain device characteristics to aid in further isolation of problems.) For example, if you code SCAN LIMITS(0,10) on the control statement and the device is a 3310, the channel program would be built to read 32 blocks starting at relative block 0; and if SPEED were coded, the channel program would be built to read 352 blocks.

Also, the numbers scanlo and scanhi must be equal or in ascending order, and they must fall within the device address limits: low to high relative cylinder number or low to high relative block number. Incorrect specification will result in an error message and cause execution of the command to terminate.

ALL
An optional parameter which specifies that all blocks or all cylinders are to be read during the data verification tests.

Abbreviations:

LIMITS|LIMIT|LIMS|LIM

Default: ALL

Restrictions: The LIMITS parameter applies only when the SCAN parameter has been specified.

SPEED|NOSPEED: SPECIFY DATA VERIFICATION TESTS

Explanation: SPEED|NOSPEED are optional parameters which specify how much is read by each EXCP for the data verification tests.

SPEED
For the 3310 and 3370, this parameter specifies that the maximum number of blocks is read for each EXCP (352 and 744 respectively). For count key data devices, one cylinder is read at a time.

NOSPEED
For the 3310 and 3370, NOSPEED specifies the number of blocks for each EXCP is 32 and 248 respectively. For count key data devices, one track is read at a time.

Abbreviations:

NOSPEED|NSPEED.

Defaults: NOSPEED.

Restrictions: You should not specify SPEED when you are running under VM/370, as this degrades the performance of other VM/370 users.

MSS: ANALYZING AN MSS STAGING VOLUME

Explanation: MSS is an optional parameter to be specified only when ANALYZE is executed against an emulated 3330-11 MSS staging volume that resides on a 3350 device.

By specifying this parameter, you are allowed to specify cylinder 808 (instead of cylinder 807) as the upper limit for the data scan portion of the command (see the LIMITS parameter).

Abbreviations: None.

Defaults: None.

Restrictions: If the MSS parameter is specified without the LIMITS parameter, the data scan, if requested, will include cylinder 808. If MSS is not specified, ANALYZE will treat the volume as a nonstaging volume and will allow only cylinder 807 as the data scan upper limit.

EXAMPLES OF THE ANALYZE COMMAND

The following examples show different ways to use the ANALYZE command.

Note: Any values specified here are examples only and should not be interpreted as the values for your system.

ANALYZING A VOLUME IN A STAND-ALONE ENVIRONMENT: EXAMPLE 1

In this example, the 3310 Direct Access Storage drive tests are performed.

```
ANALYZE UNITADDRESS(141)
```

Using keyword abbreviations, you could have specified:

```
ANALYZE UNIT(141)
```

ANALYZING A VOLUME IN A STAND-ALONE ENVIRONMENT: EXAMPLE 2

In this example, the 3310 Direct Access Storage drive tests are performed and are followed by the data verification tests for the entire 3310 volume. ALL is the default.

```
ANALYZE UNITADDRESS(141) SCAN
```

ANALYZING A VOLUME IN A STAND-ALONE ENVIRONMENT: EXAMPLE 3

In this example, the 3370 Direct Access Storage drive tests are performed, followed by partial data verification tests beginning at relative block number 25 and ending at relative block number 50. Abbreviations have been used.

```
ANALYZE UNIT(141) LIMS(X'19',X'32') SCN
```

Note: For this fixed block architecture device, the actual data verification would have resulted in two EXCPs being issued. The first would have read relative blocks 0 through 31; the second would have read relative blocks 32 through 63. The rounding algorithm, taking the default of NOSPEED, first verified that the limits were within the device limits, and then rounded up the high limit to 63 and then rounded down the low limit to 0, resulting in two EXCPs, each reading 32 blocks. (If SPEED had been specified, rounding would have resulted in one EXCP to read 352 blocks.)

ANALYZING A VOLUME IN A STAND-ALONE ENVIRONMENT: EXAMPLE 4

In this example, the 3350 Direct Access Storage drive tests are performed, followed by partial data verification tests beginning at relative cylinder 6 and ending at relative cylinder 9.

```
ANALYZE UNITADDRESS(351) LIMITS(6,9) SCAN
```

ANALYZING A VOLUME IN AN OS/VS ENVIRONMENT (ONLINE): EXAMPLE 5

In this example, drive tests are performed on two volumes (designated as VOLUMEG and VOLUME2). Specification of the SCAN parameter indicates that data verification tests are to be run after successful completion of the drive tests.

```
//EXAMPLE5 JOB
//         EXEC  PGM=ICKDSF
//VOLUMEG  DD    UNIT=3330,DISP=OLD,VOL=SER=PAY345
//VOLUME2  DD    UNIT=3330,DISP=OLD,VOL=SER=PAY320
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 ANALYZE DDNAME(VOLUMEG)
 ANALYZE DDNAME(VOLUME2) SCAN -
         LIMITS(2,5)
/*
```

ANALYZING A VOLUME IN A DOS/VSE ENVIRONMENT: EXAMPLE 6

In this example, drive tests are performed on the volume SYS001. Specification of the NOSCAN parameter indicates that data verification tests are not to be performed.

```
// JOB   jobname
// ASSGN SYS001,150
// EXEC  ICKDSF,SIZE=AUTO
   ANALYZE SYSNAME(SYS001) NOSCAN
/*
/&
```

ANALYZING AN MSS VOLUME IN AN OS/VS ENVIRONMENT (OFFLINE): EXAMPLE 7

In this example, drive tests are performed on an MSS volume (3330-11 emulated on a 3350) that is mounted on a cuu address of 164.

```
//Example7 JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
  ANALYZE UNIT(164) MSS
/*
```

DIAGNOSTIC MESSAGES

ANALYZE prints diagnostic messages on the system printer or on the system console. They can be used by a programmer (and by the customer engineer or service representative) to determine more precisely the kind of problem that is detected by ANALYZE.

A diagnostic message names the test in which the failure occurred, and is followed by information appropriate to describing the error—a display of the failing CCW, the CSW at the time of failure, and the sense bytes, as follows:

```
SNS TEST
CSW = 008050 0E000000 CCW = 041F8D78 20000018
SENSE = 10000800 10008910 180B60B5 400E188F 0E010003
00001440
```

In the above example, a channel command word (CCW) issued during the SNS test failed. In the CSW, the channel end, device end, and unit check indicators are on. For more details on CCW, CSW, and sense byte interpretation, see the appropriate direct-access storage reference manual (see the list in the "Preface").

Diagnostic messages are issued during the drive tests and data verification tests if an error is detected. These messages and their meanings are shown in Figure 3 on page 33 and Figure 4 on page 34.

Most of the diagnostic messages are useful only to the customer engineer or to the service representative. Four of the diagnostic messages, however, are useful to the programmer who analyzes the output from ANALYZE. The four messages are described below so that you can understand the conditions under which each is issued. Your installation's recovery procedures may correct the problems indicated by these messages, so that you do not have to call a customer engineer or service representative to correct them.

- WRT WRITE INHIBIT SWITCH ON

  This condition is detected when the WRT test attempts to write a record and fails because the "R/W or READ" switch on the drive's operator panel is in the "READ" position.

  This message provides sense information that verifies console message ICK414I. The operator's response to message ICK414I usually corrects the condition. The operator should rerun ANALYZE if the testing of the drive's writing capabilities is desired.

```
                        MOVABLE HEAD ERROR TABLE
HEAD NUMBER   DATA CHK   SEEK VERIFY   WRITE CHK   DATA CHK   DATA COMP
                            CHECK                    CE CYL     ERROR
    00 -----|----------|-------------|-----------|----------|----------|
    01 -----|----------|-------------|-----------|----------|----------|
    02 -----|----------|-------------|-----------|----------|----------|
    03 -----|----------|-------------|-----------|----------|----------|
    04 -----|----------|-------------|-----------|----------|----------|
    05 -----|----------|-------------|-----------|----------|----------|
    06 -----|----------|-------------|-----------|----------|----------|
    07 -----|----------|-------------|-----------|----------|----------|
    08 -----|----------|-------------|-----------|----------|----------|
    09 -----|----------|-------------|-----------|----------|----------|
    10 -----|----------|-------------|-----------|----------|----------|
    11 -----|----------|-------------|-----------|----------|----------|
    12 -----|----------|-------------|-----------|----------|----------|
    13 -----|----------|-------------|-----------|----------|----------|
    14 -----|----------|-------------|-----------|----------|----------|
    15 -----|----------|-------------|-----------|----------|----------|
    16 -----|----------|-------------|-----------|----------|----------|
    17 -----|----------|-------------|-----------|----------|----------|
    18 -----|----------|-------------|-----------|----------|----------|
    19 -----|----------|-------------|-----------|----------|----------|
    20 -----|----------|-------------|-----------|----------|----------|
    21 -----|----------|-------------|-----------|----------|----------|
    22 -----|----------|-------------|-----------|----------|----------|
    23 -----|----------|-------------|-----------|----------|----------|
    24 -----|----------|-------------|-----------|----------|----------|
    25 -----|----------|-------------|-----------|----------|----------|
    26 -----|----------|-------------|-----------|----------|----------|
    27 -----|----------|-------------|-----------|----------|----------|
    28 -----|----X-----|------X------|-----X-----|----X-----|-----X----|
    29 -----|----X-----|------X------|-----X-----|----X-----|-----X----|
```

Figure 3. The Movable Head Error Table

- DATAVER DATA CHECKS EXCEEDED THRESHOLD

  A data check is a read/write error that the device detects, and is indicated in the sense bytes. When the number of tracks with data checks for a logical volume exceeds the number of alternate tracks for the volume, the data verification test prints this message and terminates. The threshold for each type of logical volume is:

  IBM 3344 logical volume—24 data checks
  IBM 3350 (native mode) volume—150 data checks
  IBM 3350 (3330-1 mode) logical volume—133 data checks
  IBM 3350 (3330-11 mode) logical volume—133 data checks
  IBM 3375 (native mode) volume—15 data checks
  IBM 3380 (native mode) volume—15 data checks

  For fixed block architecture device support, this message has a different meaning. The 3310 and 3370 each have a very high number of alternate blocks that can be assigned by the user to bypass data errors in prime blocks. Because the number is very high, ANALYZE execution is terminated after 504 data checks have been logged on the system printer.

```
                          FIXED HEAD ERROR TABLE
HEAD NUMBER  DATA CHECK SEEK VERIFY  HEAD NUMBER  DATA CHECK SEEK  VERIFY
                           CHECK                                   CHECK
   00 -----|-----X-----|-----X-----|    30 -----|-----X-----|-----X-----|
   01 -----|-----X-----|-----X-----|    31 -----|-----X-----|-----X-----|
   02 -----|-----------|-----------|    32 -----|-----------|-----------|
   03 -----|-----------|-----------|    33 -----|-----------|-----------|
   04 -----|-----------|-----------|    34 -----|-----------|-----------|
   05 -----|-----------|-----------|    35 -----|-----------|-----------|
   06 -----|-----------|-----------|    36 -----|-----------|-----------|
   07 -----|-----------|-----------|    37 -----|-----------|-----------|
   08 -----|-----------|-----------|    38 -----|-----------|-----------|
   09 -----|-----------|-----------|    39 -----|-----------|-----------|
   10 -----|-----------|-----------|    40 -----|-----------|-----------|
   11 -----|-----------|-----------|    41 -----|-----------|-----------|
   12 -----|-----------|-----------|    42 -----|-----------|-----------|
   13 -----|-----------|-----------|    43 -----|-----------|-----------|
   14 -----|-----------|-----------|    44 -----|-----------|-----------|
   15 -----|-----------|-----------|    45 -----|-----------|-----------|
   16 -----|-----------|-----------|    46 -----|-----------|-----------|
   17 -----|-----------|-----------|    47 -----|-----------|-----------|
   18 -----|-----------|-----------|    48 -----|-----------|-----------|
   19 -----|-----------|-----------|    49 -----|-----------|-----------|
   20 -----|-----------|-----------|    50 -----|-----------|-----------|
   21 -----|-----------|-----------|    51 -----|-----------|-----------|
   22 -----|-----------|-----------|    52 -----|-----------|-----------|
   23 -----|-----------|-----------|    53 -----|-----------|-----------|
   24 -----|-----------|-----------|    54 -----|-----------|-----------|
   25 -----|-----------|-----------|    55 -----|-----------|-----------|
   26 -----|-----------|-----------|    56 -----|-----------|-----------|
   27 -----|-----------|-----------|    57 -----|-----------|-----------|
   28 -----|-----------|-----------|    58 -----|-----------|-----------|
   29 -----|-----------|-----------|    59 -----|-----------|-----------|
```

Figure 4. The Fixed Head Error Table

- DATAVER DATA CHECK ADDR

  This error is detected when the data verification test detects a data check. For the 3344 and 3350 the logical volume's cylinder, CC, and head, HH, are printed to indicate the track on which the data check occurred. These are hexadecimal values that indicate the logical, rather than physical, address on the logical volume. For the 3310 and 3370, ADDR is the failing relative block number for the device. Each data check detected by the data verification test is described with this message.

  This message may also be printed when a drive error that would normally have been detected during the drive tests occurs during the data verification test. The condition that caused the drive error is usually intermittent or marginal, and was not detected during the drive tests. You can examine the sense bytes to determine whether a data check or another type of error occurred.

- DATAVER DATA FORMAT UNACCEPTABLE ON CYL xx

  This error is detected during the data verification test when one of the following conditions occurs on a count key data device:

  - The test determines that the data on the identified cylinder is written in a format other than the IBM standard format. This is the usual cause of the message.

- A drive error (such as dropping ready) occurred during the test. The condition that caused the drive error is usually intermittent or marginal, and was not detected during the drive tests.

- When the volume under test is also accessed by another program, the other program erased an end-of-data record <u>after</u> it had been read by the data verification test and <u>before</u> it had been read again by the test. This is a possible, though unlikely, situation.

The volume's logical cylinder address, a hexadecimal value, is printed with the message. To determine more accurately the cause of the message, you can examine the sense information and the CSW (if it is printed with the message). If an intermittent drive error occurred, the sense information can be used to analyze it.

In addition to the diagnostic messages, ANALYZE produces tables that summarize errors associated with the read/write circuitry that occurred during the drive tests: the movable head error table (shown in Figure 3 on page 33), and the fixed head in Figure 4 on page 34.

Note: The fixed head error table may be printed even though the drive under test does not include the fixed-head feature. In that case, the table applies to movable heads 00 through 29.

DRIVE TEST MESSAGES

During the drive test, diagnostic messages are issued on the system printer for each error detected during execution of a channel program. If a channel program has not completed successfully, an appropriate diagnostic message is issued.

A diagnostic message identifies by name the test in which the failure occurred, and is followed by information appropriate to describing the error, such as a display of the failing CCW, the CSW at the time of failure, and the sense bytes. Figure 5 shows the diagnostic messages and their meanings of each message.

Diagnostic Message Issued	**Meaning**
FIXED BLOCK CALIBRATION SEEK TEST: BCALSK	An error is detected during an attempt to move the access arm from block 244 to a specified location and back again to read.
FIXED BLOCK HEAD SEEK TEST: BHDSK	An error is detected during an attempt to write multiple blocks and seek to the next sequential track. (3310 only)
FIXED BLOCK INCREMENTAL SEEK TEST: BINCSK	An error is detected during an attempt to switch heads randomly to read.
FIXED BLOCK SERVO SEEK TEST: BSRVOSK	An error is detected during an attempt to write and read back block 244 of the CE area.
FIXED BLOCK DATA COMPARE FAILED: BWRCE	An error is detected when the record read did not compare equally with the same record previously written.

Figure 5 (Part 1 of 3). Drive Test Diagnostic Messages

Diagnostic Message Issued	**Meaning**
FIXED BLOCK READ PREFORMATTED BLOCK TEST:BWRNFPS	An error is detected during an attempt to read block 296 of the CE area (3370 only)
FIXED BLOCK WRITE PRESELECTED BLOCKS TEST: BWRNFP	An error is detected during an attempt to write multiple blocks in the CE area. (3370 only)
CLEANUP TEST: CLEANUP OF C. E. CYLINDER TRACK 0 FAILED (see note)	An error is detected when ANALYZE has completed its test and an error occurs during the cleanup of track 1 on the CE cylinder.
RDMT DATA COMPARE TEST: WRONG RECORD READ (see note)	An error is detected when a drive error caused the wrong record to be read.
RDMT TEST: MULTI-TRACK READ IN C. E. CYLINDER FAILED (see note)	An error is detected when ANALYZE attempts to read records on the CE cylinder.
RECAL TEST: RECALIBRATE TO CYL 0 HEAD 0 FAILS (see note)	An error is detected when ANALYZE attempts to recalibrate the access arm to cylinder 0, head 0 and fails.
RHA HA INCORRECT: HOME ADDRESS DATA READ IS INCORRECT	An error is detected when ANALYZE reads a home address other than the one expected.
RHA TEST: READ HOME ADDRESS ON C.E. CYLINDERS FAILED(see note)	An error is detected when ANALYZE attempts to read the CE cylinder's home address and fails.
RHAFH TEST: READ HOME ADDRESS UNDER FIXED HEADS FAILED (see note)	An error is detected when ANALYZE attempts to read all the home addresses under the fixed heads and fails.
RHAMH TEST: READ HOME ADDRESS UNDER MOVEABLE HEADS FAILED (see note)	An error is detected when ANALYZE attempts to read home addresses under all the movable heads and fails.
RPS ERROR: READ SECTOR OR SET SECTOR FAILED (see note)	An error is detected when ANALYZE attempts to read sector or to set sector and fails.
SKINCR TEST: INCREMENTAL MOVEMENT OF ACCESS ARM FAILED (see note)	An error is detected when ANALYZE attempts to move the access arm incrementally and fails.
SKMAX TEST: SEEK FROM CYLINDER 0 TO MAXIMUM CYLINDER FAILED (see note)	An error is detected when ANALYZE attempts to move the access arm from cylinder 0 to the maximum cylinder address and fails.

Figure 5 (Part 2 of 3). Drive Test Diagnostic Messages

Diagnostic Message Issued	Meaning
SKRAN TEST: RANDOM CYLINDER ACCESS FAILED (see note)	An error is detected when ANALYZE attempts to move the access arm "randomly" from one cylinder address to another and fails.
SNS TEST: ERROR IN SENSE CCW (see note)	An error is detected when ANALYZE attempts to obtain sense information and fails.
WRT TEST: WRITE RECORDS R0 and R1 ON C.E. CYLINDER FAILED (see note)	An error is detected when ANALYZE attempts to write records 0 and 1 on the CE cylinder and fails.
*** WRITE INHIBIT SWITCH ON	An error is detected when ANALYZE attempts to write a record and fails because the "R/W" or "READ" switch is in the "READ" position, or the "READ/WRITE" switch position is defective.
WRTPAD READ WRONG RECORD	An error is detected when ANALYZE attempts to write a record using the write count, key, and data command, and read it back. The record read back (which should have been overwritten with zeros) was not as expected.
WRTPAD TEST: WRITE COUNT, KEY, DATA FAILED (see note)	An error is detected when ANALYZE attempts to write a record using the write count, key, and data command and fails.

Figure 5 (Part 3 of 3). Drive Test Diagnostic Messages

Note to Figure 5 on page 35

The diagnostic message is followed by:

CSW = hhhhhh hhhhhhhh CCW = hhhhhhhh hhhhhhhh SENSE = hhhhhhhh hhhhhhhh hhhhhhhh hhhhhhhh hhhhhhhh hhhhhhhh where CSW = is followed by 7 bytes of the failing CSW in hexadecimal digits, CCW = is followed by 8 bytes of the failing CCW in hexadecimal digits, and SENSE = is followed by 24 bytes of the sense information displayed in hexadecimal digits. For detailed information on the sense information, see the reference manuals listed in the Preface.

MOVABLE AND FIXED HEAD ERROR TABLES

In addition to the diagnostic messages, if errors associated with the read/write circuitry occurred during the drive test, ANALYZE produces two tables to summarize the errors; a movable head error table and a fixed head error table. These tables are printed on the system printer after all tests are completed. Figure 3 on page 33 shows the format of the movable head error table. The physical heads or tracks are listed in the first column on the left. A character 'X' is placed in the column corresponding to the type of error detected for a particular head. Figure 4 on page 34 shows the format of the fixed head error table. The first column of the left group and the first column of the right group list the physical head or tracks. A character 'X' is placed in the column corresponding to the type of error detected for a particular head.

The fixed head error table could be printed for a 3350 in native or compatibility mode even if the fixed head feature were not specified. This may happen if an intermittent error occurred on the movable heads during the fixed head test. If this occurs, see the conversion table in Figure 6 to determine which physical movable head number corresponds with the fixed head number in the fixed head error table.

Head Number From Fixed Head Error Table	Physical Movable Head Number		Head Number From Fixed Head Error Table	Physical Movable Head Number	
	3350[1]	3330 (compatibility modes)[2]		3350[3]	3330 (compatibility modes)[4]
0	0	20	30	0	11
1	1	21	31	1	12
2	2	22	32	2	13
3	3	23	33	3	14
4	4	24	34	4	15
5	5	25	35	5	16
6	6	26	36	6	17
7	7	27	37	7	18
8	8	28	38	8	0
9	9	29	39	9	1
10	10	20	40	10	2
11	11	21	41	11	3
12	12	22	42	12	4
13	13	23	43	13	5
14	14	24	44	14	6
15	15	25	45	15	7
16	16	26	46	16	8
17	17	27	47	17	9
18	18	28	48	18	10
19	19	0	49	19	11
20	20	1	50	20	12
21	21	2	51	21	13
22	22	3	52	22	14
23	23	4	53	23	15
24	24	5	54	24	16
25	25	6	55	25	17
26	26	7	56	26	18
27	27	8	57	27	Unused
28	28	9	58	28	Unused
29	29	10	59	29	Unused

[1] The head numbers listed below are on physical cylinder 1.
[2] The first 10 head numbers listed below (20-29) are on physical cylinder 0. The next 20 head numbers (20-28 and 0-10) are on physical cylinder 1.
[3] The head numbers listed below are on physical cylinder 2.
[4] The first 8 head numbers listed below (11-18) are on physical cylinder 1. The next 19 head numbers (0-18) are on physical cylinder 2.

Figure 6. Mapping of Fixed Head Numbers to Physical Movable Head Numbers if Fixed Head Feature Not Present

DATA VERIFICATION TEST MESSAGES

During the data verification test, diagnostic messages may be issued on the system printer if an error is detected. See Figure 7 for a list of messages that may be issued and their meanings.

Diagnostic Message Issued	Meaning
DATAVER DATA CHECK ADDR = hhhh hhhh (see Notes 1 and 2)	A data check was detected during the data verification test. The probable cause was a media problem but a drive error may have occurred. The condition that caused the drive error is intermittent or marginal and was not detected during the drive test.
DATAVER DATA CHECKS EXCEEDED THRESHOLD	For CKD devices, the number of tracks with data checks for the device has exceeded the number of alternate tracks on the volume. For FBA devices, the number of data checks exceeded the arbitrary limit of 504.
DATAVER DATA FORMAT UNACC EPTABLE ON CYL hhhh hhhh (See Notes 1 and 2)	For CKD devices, data on the cylinder is written in a format other than the IBM standard format, or an intermittent drive error occurred during the data verification test, or the volume under test was accessed by another program and the other program erased an EOD record after it has been read by the data verification test and before it has been reread by the test.
DATAVER TEST: ERROR DURING DATA VERIFICATION (see Note 2)	A drive error was detected during the data verification test.
DATAVER PERMANENT ERROR ADDR = hhhh hhhh (see Notes 1 and 2)	A drive error was detected during the data verification test.
DATAVER TEMPORARY ERROR ADDR = hhhh hhhh (see Notes 1 and 2)	A drive error was detected during the data verification test.

Figure 7. Data Verification Test Diagnostic Messages

Notes to Figure 7:

1. The logical volume's cylinder and head are represented by hhhh hhhh. This value is in hexadecimal.

2. The diagnostic message is followed by:

   CSW = hhhhhh hhhhhhhh CCW = hhhhhhhh hhhhhhhh SENSE = hhhhhhhh hhhhhhhh hhhhhhhh hhhhhhhh hhhhhhhh hhhhhhhh where CSW = is followed by 7 bytes of the failing CSW in hexadecimal digits, CCW is followed by 8 bytes of the failing CCW in hexadecimal digits, and SENSE = is followed by 24 bytes of the sense information received in hexadecimal digits.

BUILDIX: BUILDING A VTOC INDEX

Direct access volumes in the OS/VS environment may optionally be changed from the OS format VTOC (OSVTOC) to the indexed format VTOC (IXVTOC) by invoking the BUILDIX command. BUILDIX will build a VTOC index data set and prepare the VTOC to show that the volume is in IXVTOC format. BUILDIX will also change a volume in IXVTOC format to OSVTOC format.

To build an index data set on a volume, the BUILDIX command requires that the host system contain indexed VTOC programming support. Execution of the command will terminate without action if this support is not present.

"Appendix E. The VTOC Index" on page 157 contains more information about indexed format VTOCs.

Note: The BUILDIX command is a valid command only in the OS/VS1 and OS/VS2 MVS environments.

DEVICES SUPPORTED BY THE BUILDIX COMMAND

All real devices supported by the host OS/VS operating system are supported by the BUILDIX command with the exception of the 2314 direct access storage device. MSS virtual volumes (3330V) are also supported by the BUILDIX command. VM/370 users who IPL an indexed VTOC supporting operating system can use BUILDIX to format minidisks and attached volumes by submitting batch jobs to their virtual machine.

Volumes containing split cylinder extents are not supported by the BUILDIX command. DOS volumes will be converted to OSVTOC format or to IXVTOC format, according to the parameters specified.

SYNTAX

Command	Required Parameters
BUILDIX	DDNAME(dname) **IXVTOC|OSVTOC**
	Optional Parameters
	PURGE|NOPURGE

DDNAME: IDENTIFYING THE DEVICE ON WHICH THE VOLUME IS MOUNTED

Explanation: DDNAME(dname) must be specified to identify the volume whose VTOC is to be changed.

DDNAME
Required when a volume is mounted online. The device on which the volume is mounted must be online and the volume mounted as PRIVATE with DISP=OLD specified.

For dname, specify the OS/VS JCL DD statement that identifies the device on which the volume is mounted.

Abbreviations:

DDNAME|DNAME

Restrictions: None.

Defaults: None.

IXVTOC|OSVTOC: IDENTIFYING THE BUILDIX FUNCTION TO BE EXECUTED

Explanation: **IXVTOC** or **OSVTOC** must be specified to identify the BUILDIX function to be executed.

IXVTOC
Causes an OS/VS format VTOC to be changed to the indexed format.

OSVTOC
Causes an indexed VTOC to be changed to an OS/VS format.

Abbreviations:

IXVTOC|IX
OSVTOC|OS

Defaults: None.

Restrictions: **IXVTOC** may only be specified if indexed VTOC programming support is part of the host system. Command execution will terminate with no action taken, if this support is not available.

PURGE|NOPURGE: SPECIFYING DISPOSITION OF THE INDEX DATA SET

Explanation: **PURGE|NOPURGE** are optional parameters describing the final disposition of the index data set when changing an indexed VTOC to an OS/VS format VTOC.

PURGE
Causes deletion of the index.

NOPURGE
Causes the index to be left on the volume.

Abbreviations:

PURGE|PRG
NOPURGE|NOPRG

Default: NOPURGE.

Restrictions This parameter is valid only when changing from an indexed VTOC to an OS/VS VTOC. If specified with the parameter **IXVTOC**, the option is ignored.

BUILDIX: OSVTOC TO IXVTOC

If changing to an indexed VTOC, before invocation of BUILDIX you must preallocate the index data set in a separate job or job step; or you must provide a DD card describing the index data set in the same job step so that the scheduler will cause allocation of the index before command execution begins.

You must ensure that the name of the index data set begins with the characters "SYS1.VTOCIX." and must provide a unique third-level qualifier for each index data set in your installation. The recommended convention is "SYS1.VTOCIX.volser," which ensures that all online volumes have uniquely identified index data set names. This prohibits ENQ lockouts on all other volumes needing IXVTOC service functions to be performed. The name "SYS1.VTOCIX." is a reserved name in systems supporting the indexed VTOC, and only one data set per volume may begin with this prefix.

Space for the index must be reserved in one continuous extent. This can be accomplished by allocating the index by absolute track or by specifying the CONTIG subparameter for all other requests. The amount of space to reserve for the index is device-dependent, as well as dependent upon the size (in tracks) of the VTOC. A reference table to aid in determining how much space to reserve for the index is found in Appendix E.

BUILDIX: IXVTOC TO OSVTOC

This function will allow you to change an IXVTOC to an OSVTOC.

You are provided an option to leave the index allocated (NOPURGE) or to delete it (PURGE). The option to leave it ensures that, if the volume should be changed again to the IXVTOC format, no calculation as to size and optimum location would be necessary. This convenience is realized when an IXVTOC volume is temporarily transported to a location that does not have programming support for the indexed VTOC and is then returned to a location having such support.

The procedure to follow when transporting IXVTOC volumes to nonindexed VTOC systems is to prepare the volumes prior to their removal from the indexed VTOC system by executing BUILDIX and specifying the OSVTOC parameter. Upon return of a volume, BUILDIX is again executed, if desired, to rebuild the index.

Care must be exercised if IXVTOC volumes are to be temporarily transported to nonindexed VTOC systems. If the volumes are not changed to OSVTOC format prior to being transported, serious errors may result when the volumes are returned to the indexed VTOC system. DADSM functions performed by the nonindexed VTOC system on the VTOC do not always force reconstruction of the VTOC to OSVTOC format. VTOC changes not causing reconstruction of the VTOC are not recorded in the index and, in effect, invalidate the index.

EXAMPLES OF WAYS TO CODE THE BUILDIX COMMAND

The following examples illustrate ways in which the BUILDIX command might be coded in a variety of situations.

The examples show the job control language statements you will need when invoking the BUILDIX command.

Note that the content of the data definition statement varies according to the function to be executed. The examples show various specifications of the statement.

CHANGING AN IXVTOC TO AN OSVTOC: EXAMPLE 1

In the following example, a 3330 volume having the volume identification VL3330 is to be changed to OSVTOC format. The DD statement simply identifies the volume.

```
//jobname    JOB . . .
//stepname   EXEC PGM=ICKDSF
//SYSPRINT   DD SYSOUT=A
//DDCARD     DD UNIT=(3330,,DEFER),VOL=(PRIVATE,SER=VL3330),
//           DISP=OLD
//SYSIN      DD *
 BUILDIX  DDNAME(DDCARD)  OS  NOPURGE
/*
```

- UNIT=(3330,,DEFER) specifies that mounting of the volume on the 3330 device type is to to be deferred to prevent other users from sharing the volume.

- VOL=(PRIVATE,SER=VL3330) identifies the volume and specifies a private mounting to prevent use of the volume for temporary data sets.

- DISP=OLD specifies that allocation routines will check the mount status of VL3330 and issue appropriate messages to the operator.

- Specification of NOPURGE in the BUILDIX command statement indicates that the index is to be left allocated. If NOPURGE were not specified, the command statement would have the same effect, since NOPURGE is the default. Specification of PURGE, as in the following command statement, would cause the index to be deleted.

  ```
  BUILDIX  DDNAME(DDCARD)  OSVTOC PURGE
  ```

  Note: Whether the index is purged or left allocated is controlled by command parameters. Disposition of the index data set must not be specified in the DD statement.

BUILDING A VTOC INDEX ON A VOLUME WITHOUT AN INDEX ALLOCATED: EXAMPLE 2

This option requires additional parameters on the DD statement to cause allocation of the index. The statement must contain data set information for the index.

```
//jobname    JOB . . .
//stepname   EXEC PGM=ICKDSF
//SYSPRINT   DD SYSOUT=A
//VOLDD      DD UNIT=(3330,,DEFER),VOL=(PRIVATE,SER=VL3330),
//           DSN=SYS1.VTOCIX.VL3330,DISP=(NEW,KEEP),
//           SPACE=(ABSTR,(10,1))
//SYSIN      DD *
 BUILDIX  DDNAME(VOLDD)  IXVTOC
/*
```

- DSN=SYS1.VTOCIX.VL3330 specifies the name of the index data set. The third-level qualifier, VL3330 (the volume serial), follows the recommended convention for naming the index.

- DISP=(NEW,KEEP) directs the system allocation routines to allocate the data set prior to execution of Device Support Facilities commmands and to retain it upon termination of the task.

- SPACE=(ABSTR,(10,1)) directs the allocation routines to allocate a ten-track index starting at track one. ABSTR is specified in the space request to ensure that the index space is a single continuous extent and is in the location desired by the user. If location is not a primary concern, space can be reserved by specifying SPACE=(TRK,10,,CONTIG). This causes ten contiguous tracks to be reserved at some location.

BUILDING A VTOC INDEX ON A VOLUME WITH AN INDEX ALLOCATED: EXAMPLE 3

In this example, the volume identified as VL3330 was changed to an OS/VS format at some time, either by the user or by a system routine that disabled the index and changed the VTOC to OSVTOC format. The index data set was left allocated on the volume. The DD statement required to change again to an IXVTOC is shown.

```
//jobname   JOB . . .
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//VOLDD     DD UNIT=(3330,,DEFER),VOL=(PRIVATE,SER=VL3330),
//          DSN=SYS1.VTOCIX.VL3330,DISP=OLD
//SYSIN     DD *
 BUILDIX  DNAME(VOLDD)  IX
/*
```

- DISP=OLD specifies that the data set exists.

INIT: INITIALIZING A VOLUME

A direct-access storage volume must be initialized before an operating system can use it. The INIT command can initialize count key data volumes at minimal, medial, and maximal levels, and fixed block architecture (FBA) volumes at minimal and maximal levels, by specifying parameters that control the level of initialization. These several levels of initialization are described in the sections that follow.

INITIALIZING A VOLUME AT THE MINIMAL LEVEL

Count-Key-Data Devices

A volume is initialized at the minimal level when both the NOVALIDATE and NOCHECK parameters are specified.

Minimal initialization creates the contents of cylinder 0, track 0 by:

- Writing IPL bootstrap records as records 1 and 2
- Writing a volume label as record 3

and reserves tracks for the VTOC at the location specified by the user and for the number of tracks specified. If no location is specified, tracks are reserved at the default location.

If the INDEX parameter of the INIT command is specified, a format-1 DSCB is built in the VTOC with the default data set name of SYS1.VTOCIX.volser. If the <u>volser</u> begins with a numeric character, the default data set name will be SYS1.VTOCIX.Vccccc. For example, if the <u>volser</u> is 333001 the default data set name written in the format-1 DSCB is SYS1.VTOCIX.V33001. "Appendix E. The VTOC Index" on page 157 contains more information about indexed format VTOCs.

Alternate tracks are checked for defective-track flags. If the defective-track flag is ON for an alternate track (indicating that it is, itself, defective), and if the associated primary track is still flagged defective, a nondefective alternate track is assigned to the primary track.

Primary track surfaces are not checked. Primary tracks that are associated with alternate tracks are assigned nondefective alternate tracks. If a primary track is incorrectly associated with an alternate track, or is flagged defective but not associated with an alternate track, an error message is issued.

Fixed Block Architecture Devices

For fixed block architecture (FBA) volumes, initialization is performed at the mimimal level when the NOCHECK option is specified. Minimal initialization does the following:

- The volume labels and VTOC are formatted

Tracks are reserved for the VTOC at the location you specify for the number of tracks specified. If you do not specify the location, tracks are reserved at the default location.

INITIALIZING A VOLUME AT THE MEDIAL LEVEL

Count-Key-Data Devices

A volume is initialized at the medial level when both the VALIDATE and NOCHECK options are specified.

Medial initialization includes the actions of minimal initialization, as well as validation of the existence and content of each track's home address and record 0. Validation ensures that the proper track address (cylinder and track) appears in both the home address and record 0 on each track, and that a standard record 0 exists on each track. When initializing 3350 volumes to convert from native mode to 3330-compatible mode volumes or the reverse, validation rewrites the home address and record 0 on each track.

The alternate track area is compressed and new alternates will be assigned for defective primary tracks. The flag byte in the home address for each primary track is examined and, when the defective-track flag is ON, an alternate track is assigned for the primary track.

INITIALIZING A VOLUME AT THE MAXIMAL LEVEL

Count-Key-Data Devices

A volume is initialized at the maximal level when the CHECK parameter is specified.

Maximal initialization includes the actions of minimal and medial initialization, as well as checking of track surfaces.

Skip displacement analysis is performed for 3375 and 3380 devices if surface checking detects a data check on the volume. The primary track continues to be used until the number of defects exceeds the maximum allowed and an alternate track is then assigned. In addition, skip displacement analysis is automatically performed for cylinder 0 track 0 and the first track of the VTOC (before the volume label or the format-4 DSCB is written). If possible, all defects are skipped on these tracks. If this is not possible (more than the maximum allowable defects), an alternate track is assigned. See "Appendix G. Surface Analysis" on page 164 for more information on surface analysis.

Fixed Block Architecture Devices

For fixed block architecture (FBA) volumes, initialization is at the maximal level when the CHECK parameter is specified. At this level, each block is surface checked for recording errors and any blocks that have errors have new alternates assigned. The volume labels and VTOC are then formatted.

If you specify RECLAIM with CHECK, an attempt is made to reclaim the primary surface of blocks that have had alternates assigned by prior INIT or INSPECT command executions. Any blocks that were previously marked defective by an INIT or INSPECT execution but pass the surface analysis test in this run, are marked available. However, any primary or alternate blocks that were flagged defective by the factory cannot be reclaimed by the INIT command.

The FBAVTOC parameter is used to specify the space for the VTOC for an FBA device. This parameter allows you to specify the beginning block number, number of label records, and control interval size of the VTOC. See "Appendix F. The Fixed Block Architecture VTOC (FBAVTOC)" on page 161 for more information on the FBA VTOC.

SYNTAX

Command	Required Parameters
INIT	UNITADDRESS(cuu)| DDNAME(dname)| SYSNAME(sysxxx) VERIFY(serial[,owner])| NOVERIFY
	Optional Parameters
	DEVICETYPE(devtype) PURGE|NOPURGE CHECK(n)|NOCHECK VALIDATE|NOVALIDATE RECLAIM|NORECLAIM VTOC(cylinder,track[,extent]) DOSVTOC (cylinder,track[,extent]) FBAVTOC(rbn[,extent[,cisize]]) INDEX (cylinder,track[,extent]) VOLID(serial) OWNERID(owner) LABELS(n) IPLDD({dname|dlblname} [,OBJFORMAT|,ABSFORMAT]) BOOTSTRAP|NOBOOTSTRAP MIMIC(devtype) MAP|NOMAP

UNITADDRESS|DDNAME|SYSNAME: IDENTIFYING THE DEVICE ON WHICH THE VOLUME IS MOUNTED

Explanation: UNITADDRESS(*cuu*)|DDNAME(*dname*)|SYSNAME(*sysxxx*) are required parameters identifying the volume that is to be initialized. When you initialize a volume for the first time under OS/VS or DOS/VSE, the volume must be mounted offline because it contains no volume label and is not acceptable to an operating system.

UNITADDRESS
: Required when initializing a volume that is mounted offline or when initializing a volume in a stand-alone environment.

For *cuu*, specify the address, in hexadecimal, of the channel and unit on which the volume is mounted.

Note: The device must be on a channel that is online. If the device is on a channel that is offline, the program might enter a nonterminating wait state.

DDNAME
: Required when initializing a volume that is mounted online in the OS/VS environment. The device on which the volume is mounted must be online and the volume mounted as PRIVATE with DISP=OLD specified.

For *dname*, specify the OS/VS JCL DD statement that identifies the device on which the volume is mounted.

SYSNAME
: Required when initializing a volume in the DOS/VSE environment. For *sysxxx*, specify the SYSNAME specified in the ASSGN control statement.

Abbreviations:

UNITADDRESS|UNIT
DDNAME|DNAME

Restrictions: The UNITADDRESS parameter cannot be specified when initializing a volume that is mounted online.

The DDNAME parameter cannot be specified when initializing a volume that has not been previously initialized or when the volume is in a stand-alone environment or the DOS/VSE environment.

The SYSNAME parameter cannot be specified when initializing a volume in the stand-alone or OS/VS environment.

VERIFY|NOVERIFY: VERIFYING THE VOLUME SERIAL NUMBER AND OWNER IDENTIFICATION

Explanation: VERIFY(serial[,owner])|NOVERIFY are required parameters specifying whether to verify the volume serial number and owner identification before initializing the volume.

VERIFY
: Required when you want to verify the volume serial number and owner identification before initializing the volume. If the volume serial number or owner identification does not match that found on the volume, the INIT command terminates.

  For serial, substitute one to six alphameric characters for the volume serial number.

  For owner, substitute one to fourteen alphameric characters for the owner identification.

NOVERIFY
: Required when you want to bypass verification of the volume serial number and owner identification.

Abbreviations:

VERIFY|VFY
NOVERIFY|NOVFY|NVFY

Defaults: None.

Restrictions: You cannot verify the owner identification separately from the volume serial number; both the volume serial number and the owner identification must be verified when you want to verify the owner identification.

When you specify the VERIFY parameter and verification fails, the command terminates.

DEVICETYPE: IDENTIFYING THE TYPE OF DEVICE

Explanation: DEVICETYPE(devtype) is required in a stand-alone environment when the MIMIC(MINI) or MIMIC(EMU) parameter is specified.

For devtype, substitute one to eight characters for the type of device on which the volume is mounted. See Figure 2 on page 4 for valid device types.

Abbreviations:

DEVICETYPE|DEVTYPE|DEVTYP

Defaults: None.

Restrictions: The DEVICETYPE parameter applies only when you are initializing a volume in a stand-alone environment and MIMIC(MINI) or MIMIC(EMU) is specified. If DEVICETYPE is specified when it does not apply, it will be ignored.

When initializing a 3350 Direct Access Storage volume in 3330-compatibility mode, the device type must be specified as 3330 or 3330-11, as required. The 3333 Disk Storage and Control Models 1 and 11 must be specified as 3330 and 3330-11, respectively.

PURGE|NOPURGE: WRITING OVER DATA ON A PREVIOUSLY INITIALIZED VOLUME

Explanation: **PURGE|NOPURGE** are optional parameters that specify whether you want to write over the data in the following types of data sets during initialization:

- Unexpired
- VSAM
- Password-protected
- RACF-protected

PURGE specifies that you want to write over the data. NOPURGE specifies that you do not want to write over the data. For more information on execution of the PURGE and NOPURGE parameters, see the section "Data Set Security and Protection."

A volume that appears to contain real data cannot be initialized unless the PURGE parameter is specified.

PURGE
Indicates that you want to write over existing data during initialization. For more information about the actions taken when data is found on the volume, see "Data Set Security and Protection" earlier in this book.

NOPURGE
Indicates that you do not want to write over existing data. If a volume appears to contain real data, it cannot be initialized unless the PURGE parameter is specified.

Abbreviations:

```
PURGE|PRG
NOPURGE|NOPRG|NPRG
```

Defaults: The default is NOPURGE.

Restrictions: The NOPURGE parameter does not apply in offline mode or in a stand-alone environment. If you initialize a volume in offline mode or in a stand-alone environment, all existing data on the volume is purged, regardless of whether the data is unexpired or password protected.

CHECK|NOCHECK: SURFACE CHECKING OF THE VOLUME

Explanation: For count key date devices, **CHECK(n)|NOCHECK** are optional parameters specifying whether the tracks are to be checked for recording errors. Each track is surface checked by writing and reading specially patterned records. Upon satisfactory completion of surface checking, each checked track is rewritten with a standard record 0. If surface checking identifies a defective primary track, the track is flagged, and an alternate track is assigned to it. If an alternate track is identified as defective, it is flagged as defective and treated as unavailable and, if it is associated with a primary track, the primary track is assigned a different alternate track.

For fixed block architecture (FBA) devices, the **CHECK(n)|NOCHECK** parameters are optional parameters specifying whether the blocks are to be checked for recording errors. Each block is surface checked by writing and reading specially patterned records. If surface checking identifies a defective block, the block is flagged and an alternate is assigned.

CHECK

Indicates that you want each block or track to be checked for recording errors during initialization. This parameter erases the contents of each block or track during initialization.

For n, substitute a decimal number from 1 through 10 for the number of times you want each block or track to be checked. See "Appendix G. Surface Analysis" for information about n values.

For the 3375 and 3380, ICKDSF tries to recover from defects on the track by skipping over the defective areas. If more than the maximum number of allowable defects are detected, an alternate track is assigned. See "Appendix G. Surface Analysis" for more information.

NOCHECK

Indicates that you do not want the blocks or tracks to be surface checked for recording errors during initialization.

Abbreviations:

CHECK|CHK
NOCHECK|NOCHK|NCHK

Defaults: The default is NOCHECK.

Restrictions: The maximum number you can specify with the CHECK parameter is 10.

VALIDATE|NOVALIDATE: VALIDATING THE HOME ADDRESS AND RECORD 0

Explanation: **VALIDATE|NOVALIDATE** are optional parameters specifying whether to validate the home address and record 0 for each track. Validation is less time-consuming than surface checking, but does read and validate the home address and record 0 on each track. Validation causes the remainder of the data on a track to be erased by writing a record 0.

VALIDATE

Indicates that you want to validate the home address and record 0 for each track during initialization. When you specify VALIDATE with the NOCHECK parameter, you initialize the volume at the medial level. When you specify VALIDATE with the CHECK parameter, you initialize the volume at the maximal level, because the CHECK parameter supersedes the VALIDATE parameter.

NOVALIDATE
Indicates that you do not want to validate the home address and record 0 for each track during initialization. When you specify NOVALIDATE with the NOCHECK parameter, you initialize the volume at the minimal level.

Abbreviations:

VALIDATE|VAL
NOVALIDATE|NOVAL|NVAL

Defaults: The default is NOVALIDATE, unless the CHECK parameter is specified.

Restrictions: The VALIDATE and NOVALIDATE parameters are ignored when the CHECK parameter is specified.

This parameter is invalid for fixed block architecture devices.

RECLAIM|NORECLAIM: RECLAIMING BLOCKS OR TRACKS PREVIOUSLY FLAGGED DEFECTIVE

Explanation: RECLAIM|NORECLAIM are optional parameters specifying whether to reclaim blocks or tracks that were previously flagged defective but appear to be usable after surface checking. Fixed block architecture devices' blocks that were flagged at the factory are not reclaimed.

For count key data devices, an attempt is made to reclaim all defective tracks. Because surface checking is not as exacting as that performed by the manufacturer using special hardware analyzers, factory-flagged tracks may be reclaimed. This could cause later use of the track to show previously undetected defects.

RECLAIM
Indicates that you want blocks or tracks that are identified as usable by surface checking to be reclaimed during initialization.

NORECLAIM
Indicates that you want to suppress block or track reclamation during initialization.

Abbreviations:

RECLAIM|RCLM
NORECLAIM|NORCLM|NRCLM

Defaults: The default is NORECLAIM.

Restrictions: The RECLAIM parameter applies only when the CHECK parameter has been specified. If RECLAIM is specified with NOCHECK, it will be ignored.

The RECLAIM parameter does not apply when initializing Model 2305 Fixed Head Storage Models 1 and 2.

VTOC: SPECIFYING THE VOLUME TABLE OF CONTENTS IN OS/VS

Explanation: VTOC(cylinder,track[,extent]) is an optional parameter specifying the location and size of the volume table of contents.

For cylinder,track, specify one to four decimal (n) or hexadecimal (X'n') numbers to identify the cylinder and one to four decimal (n) or hexadecimal (X'n') numbers to identify the track where the volume table of contents is to be placed.

For extent, specify one to five decimal (n) or hexadecimal (X'n') numbers for the number of tracks that are to be reserved for the volume table of contents.

Defaults: The default for cylinder,track is 0,1; when initializing a Mass Storage System staging pack, however, the default is 0,2.

The default for extent is one track.

Restrictions: The VTOC parameter is ignored if it is specified with the MIMIC(MSS) parameter.

A VTOC cannot be placed at cylinder 0, track 0.

| This parameter is invalid for fixed block architecture devices.

DOSVTOC: SPECIFYING THE VOLUME TABLE OF CONTENTS IN DOS/VSE

Explanation: DOSVTOC(cylinder,track[,extent]) is an optional parameter specifying the location and size of the volume table of contents.

For cylinder,track specify one to four decimal (n) or hexadecimal (X'n') numbers to identify the cylinder and one to four decimal (n) or hexadecimal (X'n') numbers to identify the track where the volume table of contents is to be placed.

For extent, specify one to five decimal (n) or hexadecimal (X'n') numbers for the number of tracks that are to be reserved for the volume table of contents.

Abbreviations:

DOSVTOC|DVTOC

Defaults: None.

Restrictions: If neither VTOC nor DOSVTOC is specified, the default taken is an OS/VS VTOC at cylinder 0, track 1, except for MSS, where it is cylinder 0, track 2.

A VTOC can not be placed at cylinder 0, track 0.

| This parameter is invalid for fixed block architecture devices.

| FBAVTOC: SPECIFYING THE VOLUME TABLE OF CONTENTS FOR A FIXED BLOCK ARCHITECTURE (FBA) DEVICE

| **Explanation: FBAVTOC(**rbn[,extent[,cisize]]) is an optional parameter specifying the starting location, number of label records, and control interval size of the volume table of contents (VTOC). See "Appendix F. The Fixed Block Architecture VTOC (FBAVTOC)" on page 161 for more information on the FBA VTOC.

| For rbn specify one to six decimal (n) or hexadecimal (X'n') characters for the relative block number of the start of the VTOC. The range of valid values is:

DEVICE	RANGE
3310	2 - 126,015
3370	2 - 557,999

When you specify a value at the upper limit of the pack, you must leave sufficient space for the VTOC itself. For example, if you want to format a standard 56-label VTOC at the end of a 3310 or 3370, respectively, specify,

```
FBAVTOC 126000
FBAVTOC 557984
```

Note that blocks 0 and 1 are reserved for the IPL block and the volume label blocks (VLB) respectively.

For extent, specify one to three decimal (n) or hexadecimal (X'n') characters for the number of label records in the VTOC. The valid range is from 3 to 999; however, the number you specify is rounded up to an integral multiple of the number of labels per control interval.

For cisize, specify one to four decimal (n) or hexadecimal (X'n') characters for the size of the control interval in bytes. The value specified must be an integral multiple of the device's physical block size, and must not exceed a value of 8192.

See "Appendix F. The Fixed Block Architecture VTOC (FBAVTOC)" on page 161 for FBAVTOC format and size calculations.

Abbreviations: none

Defaults: FBAVTOC(2,56,1024)

Restrictions: This parameter is valid for fixed block architecture devices only.

A VTOC can not be placed at blocks 0 and 1, which are reserved for the IPL block and the Volume Label Blocks (VLB) respectively.

INDEX: CREATING A VTOC INDEX

Explanation: INDEX(cylinder,track[,extent]) is an optional parameter specifying the starting location and size of the index data set. Values for subparameters cylinder and track are required; specification of extent is optional.

For cylinder and track, specify one to five decimal or hexadecimal numbers to identify the cylinder number, and one to five decimal numbers to identify the track number within the cylinder where the index is to start. Hexadecimal numbers may be entered by preceding the value with the letter "X" and enclosing the hexadecimal number in single quotation marks.

For extent, specify one to five decimal or hexadecimal numbers for the number of tracks that are to be reserved for the index data set. Hexadecimal numbers may also be entered, as for the cylinder and track subparameters.

Example: INDEX(10,11,12) This specification will cause the index to be placed starting at cylinder 10, track 11 for a total of 12 tracks. Expressed in hexadecimal: INDEX(X'A',X'B',X'C')

Abbreviations: None.

Defaults: No defaults will be taken for cylinder or track. The default for extent is an internal calculation based on the number of tracks in the VTOC.

Restrictions: The 2314, 3310, 3370, and MSS staging volumes are not supported by the INDEX parameter. All other devices, including VM/370 minidisks, are supported.

This parameter is ignored in the DOS/VSE environment.

VOLID: SPECIFYING THE VOLUME SERIAL NUMBER

Explanation: **VOLID(serial)** is an optional parameter specifying the volume serial number to be written in the volume label.

For serial, substitute one to six alphameric characters for the volume serial number. If fewer than six characters are specified, the serial is left-justified, and the remainder of the field is padded with blanks (X'40').

Abbreviations: None.

Defaults: When you initialize a volume that was previously initialized and do not specify the VOLID parameter, the old volume serial number remains unchanged.

Restrictions: When you initialize a volume for the first time, you must specify the VOLID parameter, or the INIT command terminates.

If you change the volume serial number of a volume that is mounted online, thereafter you must reference the volume by the new volume serial number—even though the reference may occur in the same step.

OWNERID: SPECIFYING THE VOLUME-OWNER IDENTIFICATION

Explanation: **OWNERID(owner)** is an optional parameter specifying the volume-owner identification to be written in the volume label.

For owner, substitute 1 to 14 alphameric characters for the volume-owner identification to be written in the volume label.

Abbreviations:

OWNERID|OWNER

Defaults: The default for owner during a first-time initialization is 14 blanks.

If you do not specify OWNERID when reinitializing a previously initialized volume, the owner identification remains unchanged.

Restrictions: None.

LABELS: RESERVING SPACE FOR ADDITIONAL VOLUME LABELS

Explanation: **LABELS(n)** is an optional parameter specifying that space on cylinder 0, track 0 is to be reserved for additional volume labels, also known as user volume labels. In addition to the label that must be written on the volume, a maximum of nine additional volume labels can be specified.

For fixed block architecture (FBA) volumes, space is reserved in block 1 for additional user volume labels. In addition to the VOL1 label that must be written on the volume, a maximum of five additional user volume labels can be specified.

Note: A special program module, ICKVLBL, is provided to allow you to create the contents of the user volume labels. The module is replaced by a user-written module with the same name. The microfiche listing for the module contains the information about replacing the module. If you do not format the user volume labels during initialization, a string of blanks is written in each user volume label.

To specify n for count key data devices, substitute a decimal number from 1 through 9 for the number of additional user volume labels to be placed on the volume during initialization. For fixed block architecture devices, the range for n is 1 through 5.

Abbreviations:

LABELS|LABEL|LBL

Defaults: None.

Restrictions: If LABELS is not specified, user volume labels that existed from a previous initialization are destroyed.

For count key data devices, if a value greater than 9 is specified with the LABELS parameter, the INIT command terminates.

For fixed block architecture devices, if a value greater than 5 is specified, 5 is used, a message is printed, and the command continues.

The LABELS parameter is ignored when the MIMIC(MSS) parameter is specified.

IPLDD: WRITING A USER-SUPPLIED IPL PROGRAM ON THE VOLUME

Explanation: IPLDD({dname|dlblname}[,OBJFORMAT|,ABSFORMAT]) is an optional parameter which allows you to supply an IPL program to be written on the volume during initialization.

The IPLDD and BOOTSTRAP parameters are used to specify one of the following:

- If you do not specify IPLDD, ICKDSF writes special bootstrap records that cause the processing unit to be placed in a WAIT state if the volume is specified during an attempt to load the system.
- If you specify IPLDD but do not specify BOOTSTRAP, ICKDSF supplies an IPL bootstrap which is written on the volume during initialization together with the IPL text you supply.
- If you specify IPLDD and BOOTSTRAP, ICKDSF uses the IPL bootstrap and the IPL text you supply. If neccesary, ICKDSF updates the bootstrap records to allow for possible user labels.

The maximum size permitted for the IPL program record depends upon the type of volume being initialized. The maximum sizes allowed are:

Volume Type	Maximum Bytes for IPL Program
2305-1	12,180
2305-2	13,616
2311	3,110
2314	6,514
2319	6,514
3330	12,117
3330-11	12,117

Volume Type	Maximum Bytes for IPL Program
3340	7,286
3344	7,286
3350	17,902
3375	33,984
3380	44,948

Also, the number of additional user volume labels can further limit the size allowed for the IPL program. If you supply an IPL program that exceeds the size allowed, you receive an error message but initialization continues.

For dname, substitute 1 to 8 alphameric characters for the DD statement identifying the data set that contains the IPL program you want written on the volume being initialized. The IPL program can be included within the OS/VS JCL input stream (SYSIN). If the IPL program is in the OS/VS JCL input stream, the data must be included immediately after the INIT command. For initialization in a stand-alone environment, the dname must be specified as SYSIN.

For dlblname, substitute 1 to 7 alphameric characters. These represent the file name that appears in the DLBL statement and identify the file that contains the IPL program you want written on the volume being initialized. The IPL program can be included in the DOS/VSE JCS input stream (SYSIN). It must then be included immediately after the INIT command.

OBJFORMAT

Specifies that IPL data is being supplied in object deck format; that is, cards will have one of the following strings of EBCDIC characters in columns 2 through 4:

```
TXT
RLD
ESD
END
```

Note that only cards with TXT will be processed. All others will be ignored.

OBJFORMAT may be abbreviated as OBJECT or OBJ.

ABSFORMAT

Specifies that IPL data is being supplied in the form of variable-length records that contain executable instructions. When IPL data is supplied in this format, it is necessary to provide a minimum of three records. The maximum number of records supplied and their lengths are only limited by the track capacity of the volume on which these records are to be written.

The first two records supplied must be the bootstrap records and are restricted to lengths of 24 and 144 bytes, respectively.

The contents of the IPL records and the contents of the program are not checked by ICKDSF. It is the user's responsibility to ensure that the IPL records can load an executable program. The first IPL record must contain a PSW followed by two CCWs (channel command words). The CCWs should have the following hexadecimal formats:

```
First CCW    06xxxxxx 60000090
Second CCW   08xxxxxx 00000000
```

The first CCW is a command to read in the second IPL record at main storage address xxxxxx. The second CCW is a transfer-in-channel command (a branch) to the CCW that begins the second IPL record.

The second IPL record must be 144 bytes long. Bytes 32 through 42 (starting from byte 0) cannot be used. Bytes 32 through 42 are used by ICKDSF for the seek address (bytes 32 through 37) and the CCHHR (bytes 38 through 42) of the third IPL record.

The third through nth records that are supplied are assumed to be IPL program records and will be written on the volume, without any modification, after the standard volume label and any existing user volume labels. Note that the IPL program will only be written on the first track of the pack. If the records supplied exceed in length the remaining space on the first track, the function will terminate with an error message.

ABSFORMAT may be abbreviated as ABSOLUTE or ABS.

Abbreviations:

IPLDD|IPL

Defaults: The system provides special IPL bootstrap records if you specify the IPLDD parameter without specifying the BOOTSTRAP parameter.

Restrictions: The IPLDD parameter is ignored when the MIMIC(MSS) parameter is specified.

To initialize a volume in a stand-alone environment, you must substitute SYSIN for the dname.

When an IPL program is included in the SYSIN stream, it must immediately follow the INIT command and be terminated by an ENDIPLTEXT card. The ENDIPLTEXT card is optional when the IPL program is in a data set other than the one specified by SYSIN, or when the end-of-file indicator (/*) immediately follows the data for the IPL program.

| This parameter is invalid for fixed block architecture devices.

BOOTSTRAP|NOBOOTSTRAP: WRITING IPL BOOTSTRAP RECORDS ON THE VOLUME

Explanation: **BOOTSTRAP|NOBOOTSTRAP** are optional parameters specifying whether you are supplying the IPL bootstrap records that are to be written on the volume during initialization.

BOOTSTRAP
Indicates that you are supplying the IPL bootstrap records that are written on the volume during initialization. These records must be the first four records in the IPL program text. The first text record must have IPL1 in the first four columns, followed by 24 bytes of data. These 24 bytes have the same format as the first IPL record described above under ABSFORMAT. The next three text records must have IPL2 in their first four columns, followed by 68 bytes of data each in the second and third records and 8 bytes of data in the last record. These 144 bytes of data have the same format as IPL record 2 described above under ABSFORMAT.

NOBOOTSTRAP
Indicates that you want the system to supply the IPL bootstrap records that are written on the volume during initialization.

Abbreviations:

BOOTSTRAP|BOOT
NOBOOTSTRAP|NOBOOT|NBOOT

Defaults: The default is NOBOOTSTRAP.

Restrictions: The BOOTSTRAP and NOBOOTSTRAP parameters apply only when the IPLDD parameter is specified. This parameter is ignored when the IPL program is supplied in absolute format.

| This parameter is invalid for fixed block architecture devices.

MIMIC: SPECIFYING A SPECIAL VOLUME USAGE FORMAT

Explanation: MIMIC(devtype) is an optional parameter specifying a special usage format for the volume being initialized. You can specify MINI(n), MSS, EMU(n), or EMUALL.

MINI(n)
Indicates that an OS/VS minidisk is to be initialized for a VM/370 environment. n represents the number of cylinders that are to comprise the minidisk. Details of this support are in Appendix B.

MSS
Indicates that the volume is to be formatted as a Mass Storage System staging pack. A one-track volume table of contents is created on cylinder 0, track 2 with a format-5 data set control block (DSCB) indicating that no tracks are available for allocation.

When initializing a 3330 as a Mass Storage System staging pack, cylinders 0 through 408 are identified as primary cylinders, and cylinders 409 and 410 are identified as alternate cylinders.

When initializing a 3330-11 as a Mass Storage System staging pack, cylinders 0 through 808 are identified as primary cylinders, and cylinders 809 through 814 are identified as alternate cylinders.

EMU(n)
Indicates that a partial CKD disk emulated on a fixed block device is to be initialized. In a stand-alone environment, you must also specify the DEVICETYPE parameter.

EMUALL
Indicates that a full CKD disk emulated on a fixed block device is to be initialized.

Abbreviations: None.

Defaults: None.

Restrictions: A volume being initialized as a Mass Storage System staging pack must be initialized offline at the medial or maximal level.

The MINI(n) parameter is valid in a stand-alone environment only, and requires the DEVICETYPE parameter to be specified.

When the MIMIC(MSS) parameter is specified, the VTOC, LABELS, and IPLDD parameters do not apply and are ignored.

The only device types that are valid with the MIMIC(MSS) parameter are: 3330 and 3330-11.

An emulated 3330 on a fixed block device has limited function, and only minimal initialization is possible on this device; hence parameters such as CHECK(n), VALIDATE, and RECLAIM do not apply.

When you initialize a fixed block architecture (FBA) minidisk, do not specify the MIMIC parameter.

MAP|NOMAP: PRINTING A VOLUME MAP

Explanation: MAP|NOMAP are optional parameters specifying whether to print a volume map during initialization. The volume map lists blocks and/or tracks that are found to be defective during initialization.

MAP

Indicates that you want to print a volume map during initialization.

For fixed block architecture devices, MAP specifies that a block map should be printed. The format of this map is the same as that printed by the MAPALT command when DETAIL is specified.

NOMAP

Indicates that you do not want to print a volume map or block map during initialization.

Abbreviations: None.

Defaults: The default is MAP.

Restrictions: None.

EXAMPLES OF WAYS TO CODE THE INIT COMMAND

The following examples show different ways to code the INIT command. Most are for the offline and online modes of OS/VS. To initialize a volume in a stand-alone environment, do the following:

- Eliminate the OS/VS JCL.
- Substitute the UNITADDRESS parameter for the DDNAME parameter.
- Specify the DEVICETYPE parameter.
- Substitute SYSIN for dname if the IPLDD parameter is specified.

To initialize a volume in the DOS/VSE environment, do the following:

- Replace the OS/VS JCL statements with DOS/VSE system control statements.
- Substitute the SYSNAME parameter for the DDNAME parameter.
- Substitute dlblname for dname if the IPLDD parameter is specified and the data set is located on a direct access volume. If the data set is included in stream, replace the dname with either SYSIN or SYSIPT.
- Introduce the DOSVTOC parameter if a DOS type VTOC is required on the volume.

Note: Any values specified here are examples only and should not be interpreted as the values for your system.

INITIALIZING A VOLUME FOR THE FIRST TIME IN OFFLINE MODE (OS/VS): EXAMPLE 1

In this example, a volume is initialized at the minimal level because neither the CHECK nor VALIDATE parameter is specified. Because the volume is being initialized for the first time, it must be mounted offline, and the volume serial number must be specified. Because the VTOC parameter is not specified, the program supplies a default volume table of contents at cylinder 0, track 1 that occupies one track. Initialization in offline mode causes any existing data to be purged, regardless of whether it is unexpired or password protected.

```
//EXAMPLE1  JOB
//          EXEC  PGM=ICKDSF
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 INIT UNITADDRESS(353) NOVERIFY VOLID(VOL123) -
      OWNERID(PAYROLL)
/*
```

INITIALIZING A VOLUME AT THE MINIMAL LEVEL IN ONLINE MODE (OS/VS): EXAMPLE 2

In this example, a volume is reinitialized at the minimal level because neither the CHECK nor VALIDATE parameter is specified. Because the VOLID and OWNERID parameters are not specified, the volume serial number and owner identification that exist on the volume remain unchanged on the reinitialized volume. Because the VTOC parameter is not specified, the program creates a default volume table of contents at cylinder 0, track 1 that occupies one track. By accepting the default parameter NOPURGE, the command terminates if unexpired or password-protected data sets are found.

```
//EXAMPLE2 JOB
//         EXEC  PGM=ICKDSF
//XYZ987   DD    UNIT=3330,DISP=OLD,VOL=SER=PAY456
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INIT DDNAME(XYZ987) NOVERIFY
/*
```

INITIALIZING A VOLUME AT THE MEDIAL LEVEL IN A STAND-ALONE ENVIRONMENT: EXAMPLE 3

In this example, a previously initialized volume is reinitialized at the medial level because the VALIDATE parameter is specified and the CHECK parameter is not. The home address and record 0 on each track are read and validated. The volume serial number and owner identification are verified before initialization continues and, because a new volume serial number or an owner identification is not specified, they remain unchanged on the reinitialized volume. Specification of the VTOC parameter causes a volume table of contents to be created at cylinder 42, track 12, that occupies three tracks. Because the volume is being reinitialized in a stand-alone environment, all existing data is purged, regardless of whether it is unexpired or password protected.

```
INIT UNITADDRESS(272) -
    VERIFY(VOL123 PAYROLL) VALIDATE VTOC(42,X'C',3)
```

INITIALIZING A VOLUME AT THE MAXIMAL LEVEL IN A STAND-ALONE ENVIRONMENT: EXAMPLE 4

In this example, a volume is initialized at the maximal level because the CHECK parameter is specified. If the results of surface checking show tracks are nondefective but were previously marked defective, the tracks are reclaimed. The volume serial number and owner identification remain unchanged. The volume table of contents begin at cylinder 2, track 0 and occupy one track. Because the IPLDD parameter is specified and the IPL program data is supplied (indicated by the vertical ellipsis in the example), the IPL bootstrap records will be supplied by the program by default. Because the volume is being reinitialized in a stand-alone environment, all existing data is purged, regardless of whether it is unexpired or password protected.

```
INIT UNITADDRESS(350) CHECK(2) RECLAIM -
    NOVERIFY IPLDD(SYSIN) VTOC(2,0,1)
    •
    •
    •
```

INITIALIZING TWO VOLUMES IN OFFLINE MODE (OS/VS): EXAMPLE 5

In this example, the VALIDATE parameter without the CHECK parameter in the first INIT command causes medial level initialization. The volume serial number is verified before initialization continues and is then replaced by the one supplied in the command. A default volume table of contents begins at cylinder 0, track 1 and occupies one track. Four user volume labels are written in addition to the volume label. Because the volume is being reinitialized in offline mode, all existing data is purged, regardless of whether it is unexpired or password protected. The IPLDD parameter specifies that a user-supplied IPL program is to be written, and the BOOTSTRAP parameter specifies that the bootstrap records are also user-supplied. (The IPL program and bootstrap records are indicated by the vertical ellipsis.) There are four user volume labels to be written on the volume.

The second INIT command initializes a volume at the minimal level. The volume serial number and owner identification remain unchanged. A default volume table of contents is written at cylinder 0, track 1 and occupies one track. Because the volume is being reinitialized in offline mode, all existing data is purged, regardless of whether it is unexpired or password protected.

```
//EXAMPLE5 JOB
//          EXEC  PGM=ICKDSF
//IPLDECK   DD    *
•
•
•
/*
//SYSPRINT DD    SYSOUT=A
//SYSIN     DD    *
 INIT UNITADDRESS(353) VALIDATE VOLID(AAA789) -
      OWNERID(SMITH) VERIFY(XYZ123) -
      IPLDD(IPLDECK) BOOTSTRAP LABELS(4) NOMAP
 INIT UNITADDRESS(271) NOVERIFY
/*
```

INITIALIZING A VOLUME AT THE MEDIAL LEVEL IN OFFLINE MODE (OS/VS) AS A MASS STORAGE SYSTEM STAGING PACK: EXAMPLE 6

In this example, the VALIDATE parameter without the CHECK parameter causes medial level initialization. The volume serial number and owner identification are not changed. A default volume table of contents begins at cylinder 0, track 2 and occupies one track. Because the volume is being reinitialized in offline mode, all existing data is purged, regardless of whether it is unexpired or password protected.

```
//EXAMPLE6 JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INIT UNITADDRESS(253) NOVERIFY VALIDATE -
      MIMIC(MSS)
/*
```

INITIALIZING A MINIDISK IN A STAND-ALONE ENVIRONMENT: EXAMPLE 7

In this example, a mini 2314 is initialized without an IPL program. It provides 19 primary cylinders and one alternate cylinder on unit 150. The VTOC is located on cylinder 1, track 1, and is one track long labeled 231401. The surface is checked and, if any tracks are found to be defective, alternate tracks are assigned. The label and VTOC are written in OS format.

```
INIT  UNITADDRESS(150) NOVERIFY DEVICETYPE(2314) -
     MIMIC(MINI(20)) VTOC(1,1,1) VOLID(231401) CHECK(5)
```

INITIALIZING A MINIDISK IN A STAND-ALONE ENVIRONMENT: EXAMPLE 8

In this example, a mini 3330 is initialized without an IPL program. It provides 30 primary and no alternate cylinders on unit 151. The VTOC is written on a default location of cylinder 0, track 1 for a length of one track. The volume is labeled 333000. The IPL program supplied as the input deck is written on cylinder 0, track 0. The label and VTOC are written in OS format.

```
INIT  UNITADDRESS(151) NOVERIFY DEVICETYPE(3330) -
     MIMIC(MINI(30)) VOLID(333000) IPLDD(SYSIN)
```

INITIALIZING A VOLUME AT MINIMAL LEVEL IN THE DOS/VSE ENVIRONMENT: EXAMPLE 9

In this example, a volume is initialized at a minimal level under DOS/VSE. A DOS/VSE format VTOC is written on cylinder 32, track 0 for a length of 20 tracks. The volume is labeled 231401.

```
    //  JOB      jobname
    //  ASSGN    SYS002,151
|   //  EXEC     ICKDSF,SIZE=AUTO
          INIT SYSNAME(SYS002) NOVERIFY -
               DOSVTOC(X'20',X'0',X'14') VOLID(231401)
    /*
    /&
```

INITIALIZING AN EMULATED PARTIAL DISK AT MINIMAL LEVEL IN THE DOS/VSE ENVIRONMENT: EXAMPLE 10

In this example, an emulated partial disk is initialized under DOS/VSE. A DOS/VSE format VTOC is written at cylinder 0, track 1 for a length of 1 track. The volume is labeled AA2311.

```
//  JOB      jobname
//  ASSGN    SYS000,353
//  EXEC     ICKDSF,SIZE=AUTO
    INIT SYSNAME(SYS000) NVFY DVTOC(0,1,1) -
         VOLID(AA2311) MIMIC(EMU(20))
/*
/&
```

INITIALIZING A VOLUME WITH AN INDEX (OS/VS): EXAMPLE 11

This example is similar to Example 2, above, but as a result of this command an index to the VTOC is created.

```
//          JOB
//          EXEC  PGM=ICKDSF
//XYZ987    DD    UNIT=3375,DISP=OLD,VOL=SER=PAY456
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 INIT DDNAME(XYZ987) NOVERIFY INDEX(X'A',X'B',X'2')
/*
```

INITIALIZING A FIXED BLOCK ARCHITECTURE VOLUME IN A STAND-ALONE ENVIRONMENT: EXAMPLE 12

In this example, a Fixed Block Architecture device is initialized at a minimal level. The volume is labeled 331022. The owner ID of SMITH is written in the volume label. Space is reserved for 3 additional user volume labels starting at block 1, and a fixed block architecture VTOC starting at block 2 for 100 blocks with a VTOC control interval size of 512. NOMAP suppresses the list of alternates.

```
INIT   UNITADDRESS(2E4) NOVERIFY NOCHECK VOLID(331022) -
      OWNERID(SMITH) LABELS(3) FBAVTOC(2,100,512) NOMAP
```

INITIALIZING A FIXED BLOCK ARCHITECTURE VOLUME IN A DOS/VSE ENVIRONMENT: EXAMPLE 13

In this example, a fixed block architecture device is initialized at a maximal level by specifying CHECK and VERIFY. The volume serial and owner ID are verified before initialization is continued. Surfaces are checked and, if any blocks are found to be defective, alternate blocks are assigned. An FBA VTOC is located starting at block 2 for 100 blocks with a VTOC control interval size of 1024. MAP specifies a detail map is to be printed. Any blocks that were previously flagged defective but now appear to be usable after surface checking are reclaimed.

```
//  JOB      jobname
//  ASSGN    SYS005,353
//  EXEC     ICKDSF,SIZE=AUTO
      INIT  SYSNAME(SYS005) VERIFY(337011,JONES) CHECK(1) -
            FBAVTOC(2,100,1024) MAP RECLAIM
/*
/&
```

INITIALIZING A FIXED BLOCK ARCHITECTURE MINIDISK IN A STAND-ALONE ENVIRONMENT: EXAMPLE 14

In this example, a fixed block architecture 3370 minidisk is initialized in a stand-alone environment. The volume ID and owner ID are checked. Space is reserved for a fixed block architecture VTOC starting at block 2, for 100 blocks with a VTOC control interval size of 512. The volume is labeled 337019. Space is reserved for 3 user volume labels. The size of the minidisk is obtained from VM/370.

```
INIT  UNITADDRESS(151) VERIFY(337022,PSMITH) -
    FBAVTOC(X'2',X'64',X'200') VOLID(337019) LABELS(3)
```

INSPECT: INSPECTING A VOLUME FOR DEFECTIVE BLOCKS OR TRACKS

After initialization, you can use the INSPECT command to inspect an apparently defective volume to detect defective blocks or tracks and to assign alternate blocks or tracks, or to reclaim tracks that were previously flagged defective. Several options are available for inspection:

- The TRACKS and ALLTRACKS parameters are provided to inspect individual tracks or all the tracks.

- For fixed block architecture (FBA) volumes, the BLOCKS parameter is provided to inspect blocks.

- The CHECK parameter is provided to check each block or track surface and to permit optional specification of the number of checking cycles that are to be performed on each block or track being inspected. Normally, an alternate is assigned to a primary block or track only after an inspection of the surface reveals defects. The NOCHECK parameter suppresses such checking and, unless alternate block or track assignment is suppressed, an alternate will be unconditionally assigned to a defective block or track.

- The PRESERVE parameter is provided to save data that would normally be destroyed during block or track inspection. Before a surface is inspected, its contents are read and saved. After a surface is inspected and found to be nondefective, the saved data contents are written back to the same area. If a block or track is found to be defective, the saved data contents are written on an assigned alternate. The NOPRESERVE parameter allows inspection to destroy the data content of a block or track.

- The RECLAIM parameter is provided to reclaim a track that was previously flagged defective, but track inspection has determined is capable of recording data. The NORECLAIM parameter suppresses automatic track reclamation. These parameters are invalid for fixed block architecture (FBA) devices.

- The ASSIGN parameter automatically assigns alternates for primary or alternate blocks or tracks that are found to be defective. Automatic assignment of alternates is suppressed by the NOASSIGN parameter.

- The MAP parameter provides printed output of the detailed status of each block or track. The NOMAP parameter suppresses the printed output.

- For 3375 and 3380, when a CHECK function is being performed, ICKDSF performs surface checking to locate and/or skip over defective areas on the track. If the primary track contains more than the maximum number of allowable defects, an alternate track is assigned, if specified.

INSPECTING A VOLUME TO ASSIGN ALTERNATE BLOCKS OR TRACKS

A block or track can be flagged as defective, and an alternate assigned, either conditionally or unconditionally. You can control the assignment of alternate blocks or tracks as follows:

- Issue the INSPECT command and specify the CHECK and ASSIGN parameters to detect defective primary and alternate blocks or tracks. If a primary or alternate surface is identified as defective by surface checking, the surface is flagged as defective, and an alternate surface is assigned to the defective block or track.

- For the 3375 and 3380, issue the INSPECT command and specify CHECK to initiate surface checking for defects. An alternate track is assigned only if more than the maximum allowable number of defects are detected.
- Issue the INSPECT command and specify the NOCHECK and ASSIGN parameters to unconditionally assign alternate surfaces for the blocks or tracks inspected.
- To inspect primary and alternate blocks or tracks, but to prevent assignment of alternates, issue the INSPECT command and specify the NOASSIGN parameter. Note that if PRESERVE is specified and user data cannot be rewritten because of surface defects, an alternate is assigned.

INSPECTING A VOLUME TO RECLAIM TRACKS

As alternate tracks are assigned, either unconditionally or conditionally, their number decreases. A volume can reach a point at which the volume becomes unusable because of the reduced number of alternate tracks available.

Both primary and alternate tracks can be reclaimed. Because the surface checking performed by Device Support Facilities is not as exacting as that performed by the manufacturer using special hardware analyzers, factory-flagged tracks may be reclaimed and later use of the track can show previously undetected defects. You control track reclamation by using RECLAIM or NORECLAIM together with CHECK in the INSPECT command.

For the 3375 and 3380, specifying RECLAIM with TRACKS causes ICKDSF to attempt to recover defective tracks by skipping over defective areas. If more than the maximum number of allowable defects are detected, an alternate track is assigned if specified. Note that the surface checking information mentioned above, which is collected by the manufacturer, is not reset by ICKDSF processing.

The abbreviation for the INSPECT command is INSP.

SYNTAX

Command	Required Parameters
INSPECT	UNITADDRESS(cuu)| DDNAME(dname)| SYSNAME(sysxxx) TRACKS((cylinder,track)[,...])| ALLTRACKS BLOCKS(rbn[,...]) VERIFY(serial [,owner])| NOVERIFY
	Optional Parameters
	DEVICETYPE(devtype) CHECK(n)|NOCHECK RECLAIM|NORECLAIM PRESERVE|NOPRESERVE MAP|NOMAP ASSIGN|NOASSIGN MIMIC(devtype)

UNITADDRESS|DDNAME|SYSNAME: IDENTIFYING THE DEVICE WHERE THE VOLUME IS MOUNTED

Explanation: **UNITADDRESS**(cuu)|**DDNAME** (ddname)|**SYSNAME**(sysxxx) are required parameters identifying the volume that is to be inspected.

UNITADDRESS
Required when inspecting a volume that is mounted offline or when inspecting a volume in a stand-alone environment.

For cuu, specify the address in hexadecimal of the channel and unit on which the volume is mounted.

Note: The device must be on a channel that is online. If the device is on a channel that is offline, the program might enter a nonterminating wait state.

DDNAME
Required when inspecting a volume that is mounted online. The device on which the volume is mounted must be online and the volume mounted as PRIVATE with DISP=OLD specified.

For dname, specify the OS/VS JCL DD statement that identifies the device on which the volume is mounted.

SYSNAME
Required when inspecting a volume in the DOS/VSE environment. For sysxxx, specify the SYSNAME specified in the ASSGN system control statement.

Abbreviations:

UNITADDRESS|UNIT
DDNAME|DNAME

Defaults: None.

Restrictions: The UNITADDRESS parameter cannot be specified when inspecting a volume that is mounted online.

The DDNAME parameter cannot be specified when inspecting a volume that is mounted offline or in a stand-alone environment or the DOS/VSE environment.

The SYSNAME parameter cannot be specified when inspecting a volume in the stand-alone or OS/VS environment.

TRACKS|ALLTRACKS: SPECIFYING WHICH TRACKS TO INSPECT

Explanation: **TRACKS**(cylinder,track)|**ALLTRACKS** are required parameters specifying the tracks to be inspected.

TRACKS
Required when inspecting individual tracks on the volume.

For cylinder,track, specify one to four decimal (n) or hexadecimal (X'n') numbers to identify the cylinder, and one to four decimal (n) or hexadecimal (X'n') numbers to identify the track to be inspected.

ALLTRACKS
Required when inspecting all the tracks on the volume.

| ALLTRACKS is not valid with NOPRESERVE.

Note that the use of this option in conjunction with the CHECK(n) parameter can be time-consuming.

Abbreviations:

TRACKS|TRACK|TRKS|TRK
ALLTRACKS|ALLTRACK|ALLTRKS|ALLTRK

Defaults: None.

Restrictions: The maximum number of individual tracks that can be specified with the TRACKS parameter is 20.

This parameter is invalid for fixed block architecture devices.

BLOCKS: SPECIFYING WHICH BLOCKS TO INSPECT

Explanation: BLOCKS(rbn[,...]) is a required parameter specifying the blocks to be inspected.

For rbn, substitute the relative block number of the block to be inspected. Specify one to six decimal (n) or hexadecimal (X'n') characters. The number of rbn parameters specified cannot exceed 20.

Abbreviations:

BLOCKS|BLOCK

Defaults: None.

Restrictions: The number of rbn parameters specified cannot exceed 20.

This parameter is valid for fixed block architecture devices only.

VERIFY|NOVERIFY: VERIFYING THE VOLUME SERIAL NUMBER AND OWNER IDENTIFICATION

Explanation: VERIFY(serial[,owner])|NOVERIFY are required parameters specifying whether to verify the volume serial number and owner identification before inspecting the volume.

VERIFY
Required when you want to verify the volume serial number and owner identification before inspecting the volume. If the volume serial number or owner identification does not match that found on the volume, the INSPECT command terminates.

For serial, substitute one to six alphameric characters for the volume serial number.

For owner, substitute one to fourteen alphameric characters for the owner identification.

NOVERIFY
Required when you want to bypass verification of the volume serial number and owner identification.

Abbreviations:

VERIFY|VFY
NOVERIFY|NOVFY|NVFY

Defaults: None.

Restrictions: You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and owner identification must be verified when you want to verify the owner identification.

When you specify the VERIFY parameter and verification fails, execution of the command terminates.

DEVICETYPE: IDENTIFYING THE TYPE OF DEVICE

Explanation: DEVICETYPE(devtype) is required in a stand-alone environment when the MIMIC(MINI) or MIMIC(EMU) parameter is specified.

For devtype, substitute one to eight characters for the type of device on which the volume is mounted. See Figure 2 on page 4 for valid device types.

Abbreviations:

DEVICETYPE|DEVTYPE|DEVTYP

Defaults: None.

Restrictions: The DEVICETYPE parameter applies only when you are inspecting a volume in a stand-alone environment and MIMIC(MINI) or MIMIC(EMU) is specified. If DEVICETYPE is specified when it does not apply, it will be ignored.

When using a 3350 Direct Access Storage volume in 3330-compatibility mode, the device type must be specified as 3330 or 3330-11, as required. The 3333 Disk Storage and Control Models 1 and 11 must be specified as 3330 and 3330-11, respectively.

This parameter is valid only for count key data devices.

CHECK|NOCHECK: SURFACE CHECKING OF THE VOLUME

Explanation: For count key data devices, **CHECK(n)|NOCHECK** are optional parameters specifying whether the tracks are to be checked for recording errors. Each track is surface checked by writing and reading specially patterned records. Upon satisfactory completion of surface checking, each checked track is rewritten with a standard record 0. If surface checking identifies a defective primary track, the track is flagged, and an available alternate track is assigned to it. If an alternate track is identified as defective, it is flagged and treated as unavailable and, if it is associated with a primary track, the primary track is assigned a different alternate track.

For fixed block architecture (FBA) volumes, **CHECK(n)|NOCHECK** are optional parameters specifying whether the blocks are to be checked for recording errors. Each block is surface checked by writing and reading specially patterned records. If surface checking identifies a defective block, the block is flagged, and an available alternate block is assigned.

CHECK

Indicates that you want each block or track to be surface checked for recording errors during inspection and assigned an alternate only if the checked block or track appears defective.

For n, substitute a decimal number from 1 through 255 for the number of times you want each block or track to be checked. See "Appendix G. Surface Analysis" for information on n values.

For the 3375 and 3380, if you specify this parameter and TRACKS, ICKDSF automatically tries to recover from defects on the track by skipping over the defective areas. If this fails, and ASSIGN is specified, an alternate track is assigned. If you specify CHECK and ALLTRACKS, ICKDSF tries to recover from defects on the track by skipping over the defective areas when primary analysis indicates the possibility of a repeatable data check. If this fails, and ASSIGN is specified an alternate track is assigned. Note that the use of CHECK with TRACKS can be time consuming. See "Appendix G. Surface Analysis" for more information.

NOCHECK
Indicates that you do not want each block or track to be surface checked for recording errors during inspection. Alternate blocks or tracks are unconditionally assigned as a result of inspection when NOCHECK and ASSIGN are specified.

Abbreviations:

CHECK|CHK
NOCHECK|NOCHK|NCHK

Defaults: The default is CHECK(1).

Restrictions: The maximum number of times you can specify with the CHECK parameter is 255. However, if the ALLTRACKS parameter is specified, the maximum number of times you can specify is 10; if a number larger than 10 is specified, the number defaults to 10.

RECLAIM|NORECLAIM: RECLAIMING TRACKS PREVIOUSLY FLAGGED DEFECTIVE

Explanation: RECLAIM|NORECLAIM are optional parameters specifying whether to reclaim tracks that were previously flagged defective but appear to be usable after surface checking.

Because surface checking is not as exacting as that performed by the manufacturer using special hardware analyzers, later use of the track can show previously undetected defects.

RECLAIM
Indicates that you want tracks that are identified as usable by surface checking to be reclaimed during inspection.

NORECLAIM
Indicates that you want to suppress track reclamation during inspection.

Abbreviations:

RECLAIM|RCLM
NORECLAIM|NORCLM|NRCLM

Defaults: The default is NORECLAIM.

Restrictions: The RECLAIM parameter applies only when the CHECK parameter has been specified. If RECLAIM is specified with NOCHECK, it is ignored.

You cannot reclaim tracks on 2305 Fixed Head Storage Models 1 and 2.

This parameter is invalid for fixed block architecture devices.

PRESERVE|NOPRESERVE: PREVENTING DESTRUCTION OF DATA ON THE BLOCKS OR TRACKS INSPECTED

Explanation: PRESERVE|**NOPRESERVE** are optional parameters specifying whether to save the data on the inspected blocks or tracks. If an inspected primary block or track ia identified as defective, the data is rewritten on the alternate that is assigned. If an alternate block or track that is associated with a primary surface is identified as defective, the alternate is flagged as defective, and the data is rewritten to an available alternate. If a primary track that was previously flagged as defective is reclaimed, the data is copied from the alternate surface to the reclaimed primary surface, and the alternate surface is made available.

If PRESERVE NOASSIGN is specified, but user data cannot be rewritten after it has been read, ICKDSF overrides the NOASSIGN, assigns an alternate block or track, and rewrites the data on the alternate.

PRESERVE
Indicates that you want to save the data on the inspected blocks or tracks.

NOPRESERVE
Indicates that you do not want to save the data on the inspected blocks or tracks.

NOPRESERVE is not valid with ALLTRACKS.

Abbreviations:

PRESERVE|PRSV
NOPRESERVE|NOPRSV|NPRSV

Defaults: The default is PRESERVE.

Restrictions: Note that the data area of a rewritten record 0 is set to eight bytes of binary zeros.

Caution: If you specify the NOPRESERVE parameter with either the CHECK or ASSIGN parameter, data on the volume will be destroyed.

Note that the VTOC is no exception to this rule. Special care must be taken with the volume serial in an online environment.

MAP|NOMAP: PRINTING A VOLUME MAP

Explanation: MAP|**NOMAP** are optional parameters specifying whether to print a volume map during inspection. The volume map lists blocks or tracks that are found to be defective during inspection.

For fixed block architecture (FBA) volumes, if you specify MAP, the format of the printed map is the same as that printed by the MAPALT command when DETAIL is specified.

MAP
Indicates that you want to print a block or volume map during inspection.

NOMAP
Indicates that you do not want to print a block or volume map during inspection.

Abbreviations: None.

Defaults: The default is MAP.

Restrictions None.

ASSIGN|NOASSIGN: SPECIFYING ASSIGNMENT OF ALTERNATE BLOCKS OR TRACKS

Explanation: ASSIGN|NOASSIGN are optional parameters specifying whether alternates are to be assigned when defective primary and assigned alternate blocks or tracks are detected.

ASSIGN
Indicates that you want alternates to be assigned when defective primary and assigned alternate blocks or tracks are detected.

NOASSIGN
Indicates that you do not want alternate blocks or tracks assigned. If PRESERVE is specified and user data cannot be rewritten because of surface defects, an alternate is assigned.

Abbreviations:

ASSIGN|ASGN
NOASSIGN|NOASGN|NASGN

Defaults: The default is ASSIGN.

Restrictions: If NOASSIGN is specified with the CHECK parameter, an inspected block or track is not marked defective and an alternate is not assigned.

MIMIC: SPECIFYING A SPECIAL VOLUME USAGE FORMAT

Explanation: MIMIC(devtype) is an optional parameter specifying a special usage format for the volume being inspected. You may specify MINI(n), MSS, EMU(n), or EMUALL.

MINI(n)
Indicates that the volume to be inspected is a minidisk of 'n' cylinders. This disk must have been previously initialized. The DEVICETYPE parameter is required when this parameter is specified.

Note that this parameter is valid in the stand-alone environment only. See Appendix B for details of this support.

MSS
Indicates that the volume has been formatted as a Mass Storage System staging pack. This parameter is required when inspecting an MSS staging pack.

EMU(n)
Indicates that a partial CKD disk emulated on a fixed block device is to be inspected. The DEVICETYPE parameter is required when this parameter is specified in the stand-alone environment.

EMUALL
Indicates that a full CKD disk is emulated on a fixed block device.

Abbreviations: None.

Defaults: None.

Restrictions: The only device types valid for MINI(n) are 2311, 2314, and 2319. Inspection of an emulated 3330 (EMU(n)|EMUALL) is not permitted.

| This parameter is invalid for fixed block architecture devices.

EXAMPLES OF WAYS TO CODE THE INSPECT COMMAND

The following examples show different ways to code the INSPECT command. Most illustrate the use of the command in offline and online mode under OS/VS. To inspect a volume in a stand-alone environment, make the following changes to OS/VS examples:

- Eliminate the OS/VS JCL.
- Substitute the UNITADDRESS parameter for the DDNAME parameter.
- Specify the DEVICETYPE parameter.
- Substitute SYSIN for dname in the IPLDD parameter.

To inspect a volume in the DOS/VSE environment, do the following:

- Replace the OS/VS JCL statements with DOS/VSE system control statements.
- Substitute the SYSNAME parameter for the DDNAME parameter.
- Substitute dlblname for dname if the IPLDD parameter is specified and the data set is located on a direct access volume. If the data set is included in the job stream, replace the dname with either SYSIN or SYSIPT.
- Introduce the DOS VTOC parameter if a DOS-type VTOC is required on the volume.

Note: Any values specified here are examples only and should not be interpreted as the values for your system.

INSPECTING A VOLUME FOR CONDITIONAL ASSIGNMENT OF ALTERNATE TRACKS IN ONLINE MODE (OS/VS): EXAMPLE 1

In this example, the assignment of alternate tracks depends on the results of surface checking. The data on each specified track is copied to an alternate track if the track is defective, or is written back to the primary track if the track is not defective.

```
//EXAMPLE1 JOB
//        EXEC  PGM=ICKDSF
//VOLUMEG  DD    UNIT=3330,DISP=OLD,VOL=SER=PAY345
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INSPECT DDNAME(VOLUMEG) NOVERIFY CHECK(2) -
         TRACKS((1,3),(1,2),(2,0),(2,3),(3,2))
/*
```

INSPECTING A VOLUME FOR UNCONDITIONAL ASSIGNMENT OF ALTERNATE TRACKS IN OFFLINE MODE (OS/VS): EXAMPLE 2

In this example, the next available alternate track is assigned for the specified primary track. If the primary track is already assigned an alternate track, it will be reassigned a different alternate track. The default parameter PRESERVE causes the contents of the specified primary track to be copied to the assigned alternate.

```
//EXAMPLE2 JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INSPECT UNITADDRESS(273) NOVERIFY TRACKS(X'2',3) NOCHECK
/*
```

INSPECTING AN ENTIRE VOLUME TO PRODUCE A VOLUME MAP IN A STAND-ALONE ENVIRONMENT: EXAMPLE 3

In this example, all the tracks on the volume are inspected to produce a volume map that lists all the defective tracks. No alternate tracks are assigned.

```
INSPECT UNITADDRESS(353) NOVERIFY -
        ALLTRACKS NOASSIGN
```

INSPECTING A VOLUME TO RECLAIM TRACKS IN OFFLINE MODE (OS/VS): EXAMPLE 4

In this example, a volume is inspected to reclaim tracks that were previously marked defective. The default parameter PRESERVE causes the contents of the alternate track to be copied to the primary track if the primary track is reclaimed. Then, the alternate track becomes available for future assignment.

```
//EXAMPLE4 JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INSPECT UNITADDRESS(354) NOVERIFY TRACKS((2,3) (3,1) (1,3)) -
        RECLAIM
/*
```

INSPECTING A MINIDISK IN A STAND-ALONE ENVIRONMENT: EXAMPLE 5

In this example, a mini 2314 that has already been initialized is inspected. It provides an unconditional assigment of an alternate track for tracks 5,1 and 5,2. Note that the parameter MIMIC(MINI(20)) is specifying to Device Support Facilities that a minidisk is being inspected. If this parameter were not specified, the whole volume would be inspected and the alternate track would be assigned in the alternate track area of a full volume.

```
INSPECT  UNITADDRESS(150) NOVERIFY TRACKS((5,1),(5,2)) -
     DEVICETYPE(2314) MIMIC(MINI(20)) NOCHECK
```

INSPECTING A MINIDISK IN A STAND-ALONE ENVIRONMENT: EXAMPLE 6

In this example, a mini 2314 that has already been initialized is inspected for defective tracks. It provides a surface analysis of the entire mini 2314 and a conditional assignment of alternate tracks for any tracks that are found defective. If any tracks that were flagged defective are found to be acceptable after the surface check, these tracks are reclaimed. The data is preserved on the volume.

```
INSPECT  UNITADDRESS(150) NOVERIFY ALLTRACKS -
     DEVICETYPE(2314) MIMIC(MINI(20)) CHECK(1) -
     RECLAIM
```

INSPECTING A VOLUME TO RECLAIM TRACKS (DOS/VSE): EXAMPLE 7

In this example, a volume previously initialized under DOS/VSE is inspected. Tracks previously flagged defective that are found to be acceptable are reclaimed.

```
//  JOB      jobname
//  ASSGN    SYS010,151
//  EXEC     ICKDSF,SIZE=AUTO
    INSPECT SYSNAME(SYS010) NVFY TRKS((2,3) (3,1) (1,3)) -
    RECLAIM
/*
/&
```

INSPECTING AN EMULATED PARTIAL DISK (DOS/VSE): EXAMPLE 8

In this example, all tracks of an emulated partial disk are inspected. Tracks previously flagged defective that are found, after the surface check, to be acceptable are reclaimed.

```
//  JOB      jobname
//  ASSGN    SYS020,353
//  EXEC     ICKDSF,SIZE=AUTO
    INSPECT SYSNAME(SYS020) NVFY ALLTRKS -
    RECLAIM MIMIC(EMU(20))
/*
/&
```

INSPECTING A FIXED BLOCK ARCHITECTURE DEVICE IN A STAND-ALONE ENVIRONMENT: EXAMPLE 9

In this example, a fixed block architecture device that has already been initialized is inspected for defective blocks. It provides a surface analysis of the blocks specified in the BLOCKS parameter and a conditional assignment of alternate blocks for any blocks that are found defective. The data on the inspected blocks is preserved. A detail map of the inspected blocks is printed.

```
  INSPECT  UNITADDRESS(150) BLOCKS(50,55,57,58) CHECK(1) -
           ASSIGN PRESERVE MAP
```

UNCONDITIONAL ASSIGNMENT OF ALTERNATE BLOCKS FOR A FIXED BLOCK ARCHITECTURE DEVICE IN A STAND-ALONE ENVIRONMENT: EXAMPLE 10

In this example, an inspection is performed on a fixed block architecture device that has already been initialized. The blocks specified in the BLOCKS parameter are unconditionally assigned the next available alternate blocks.

```
  INSPECT  UNITADDRESS(380) BLOCKS(X'FA',X'10E',X'118') -
           NOVERIFY NOCHECK ASSIGN
```

INSPECTING A FIXED BLOCK ARCHITECTURE DEVICE IN A STAND-ALONE ENVIRONMENT: EXAMPLE 11

In this example, a fixed block architecture device that has already been initialized is inspected for defective blocks. The blocks specified in the BLOCKS parameter are surface checked for errors, but an inspected block is not marked defective and an alternate is not assigned.

```
  INSPECT  UNITADDRESS(2E4) BLOCKS(2000,2020,2021,2022) -
           CHECK NOASSIGN NOMAP
```

MAPALT: MAP ALTERNATE BLOCK ASSIGNMENTS

Note: The MAPALT command is valid only in the DOS/VSE and stand-alone environments.

The MAPALT command, for exclusive use on fixed block architecture (FBA) direct access storage devices, produces a printed report, or map, of the primary blocks that have been assigned to alternate blocks on the device. MAPALT parameters allow you to specify a limited range of primary blocks to be mapped or to specify that the entire volume be mapped.

Execution of the MAPALT command is restricted to reading the identification fields of the primary blocks only. It is not necessary to create backup copies of the data on the volume before the command is invoked. Thus, the command may be executed against either a newly installed device or a device that already contains user data.

The MAPALT command can only be executed against the device address that defines the entire device in fixed block mode. Emulated devices on fixed block devices are not supported.

VM/370 users will be able to IPL the stand-alone version of Device Support Facilities to execute the MAPALT command against attached volumes. Users who IPL a DOS/VSE system under VM/370 can execute the command against attached volumes by submitting batch jobs to their virtual machines.

MAPALT REPORT OUTPUT

A two-part report is produced. The first part, which may optionally be selected, is as shown below:

PRIMARY BLOCK NUMBER	BLOCK ADDRESS	ALTERNATE ADDRESS
nnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnn	C=nnn H=nn	C=nnn H=nn

This is the detailed report that shows the relative block number of the defective primary block, its location on the volume (cylinder and head number), and the location of the alternate block which has been assigned to the primary block (also in cylinder and head number).

The second portion of the report, which is always printed, is a summary message showing the number of blocks (within the specified range) found to have been assigned to alternates.

MAPALT DIAGNOSTIC OUTPUT

I/O errors that cause interruption of program execution are reported by the program. The following information appears on the program output when such errors occur:

```
CSW = xxxxxx xxxxxx CCW = xxxxxxxx xxxxxxxx
SENSE = xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx
        xxxxxxxx xxxxxxxx
```

This information should be used, in accordance with installation procedures, as an aid in isolating and correcting the cause of the problem.

If a data check is encountered, an error message is printed giving the relative block number of the block causing the error, and then processing continues with the next sequential block.

SYNTAX

Command	Required Parameters
MAPALT	UNITADDRESS(cuu)| SYSNAME(sysxxx)
	Optional Parameters
	LIMITS(lorbn,hirbn)|ALL DETAIL|NODETAIL

UNITADDRESS|SYSNAME: IDENTIFYING THE DEVICE ON WHICH THE VOLUME IS MOUNTED

Explanation: UNITADDRESS(cuu)|SYSNAME(sysxxx) are required parameters identifying the volume that is to be mapped.

UNITADDRESS
Required when mapping a volume that is mounted offline or when mapping a volume in a stand-alone environment.

For cuu, specify the hexadecimal address of the channel and unit on which the volume is mounted.

Note: The device must be on a channel that is operational. If the device is on a channel that is not operational, the program may enter a nonterminating wait state.

SYSNAME
Required when mapping a volume in the DOS/VSE environment. For sysxxx, specify the SYSNAME in the ASSGN control statement.

Abbreviations:

UNITADDRESS|UNITADDR|UNIT
SYSNAME|SNAME

Defaults: None.

Restrictions: The SYSNAME parameter cannot be specified in a stand-alone environment.

LIMITS|ALL: SPECIFYING THE AREA TO BE MAPPED

Explanation: LIMITS(lorbn,hirbn)|ALL are optional parameters specifying the area of the disk where alternate block mapping is to be performed.

LIMITS(lorbn,hirbn)

The value lorbn specifies the relative block number for the start of mapping. This value must be lower than, or equal to, the value specified by hirbn. lorbn can be expressed as one to six decimal (n) or hexadecimal (X'n') characters.

The value hirbn specifies the relative block number for the end of mapping. This value must be lower than, or equal to, the highest relative block number on the device. hirbn can be expressed as one to six decimal (n) or hexadecimal (X'n') characters.

ALL

Indicates that the entire volume is to be mapped.

Abbreviations:

LIMITS|LIMIT|LIMS|LIM

Default: ALL

Restrictions None.

DETAIL|NODETAIL: CONTROLLING THE PROGRAM OUTPUT

Explanation: **DETAIL|NODETAIL** is an optional parameter that controls the amount of output from the program.

DETAIL

Causes printing of the detailed report that lists each defective block assigned to an alternate, gives its location on the disk, and gives the location of the assigned alternate block.

NODETAIL

Causes printing of the detailed report to be suppressed.

Abbreviations:

DETAIL|DTL
NODETAIL|NODTL

Default: NODETAIL

Restrictions: This parameter only controls printing of the detailed report and does not affect other output from the program. The summary message will be printed at all times upon termination of the program.

EXAMPLES OF WAYS TO CODE THE MAPALT COMMAND

The following examples illustrate ways you might code the MAPALT command in various situations.

MAPPING A VOLUME IN THE STAND-ALONE ENVIRONMENT: EXAMPLE 1

In this example, a full volume scan of a 3310 direct access storage volume is performed and a summary report is made of the total number of blocks found that have alternates assigned.

```
MAPALT  UNITADDRESS(141) ALL NODETAIL
```

Using abbreviations and defaults, you could have specified:

```
MAPALT  UNIT(141)
```

MAPPING A VOLUME IN THE STAND-ALONE ENVIRONMENT: EXAMPLE 2

In this example, the range of blocks from 200,000 to 300,000 on a 3370 direct access storage volume is scanned. A detailed report is made of each block within that range that has an alternate assigned, and a summary report is made giving the total number of assigned alternates found.

```
MAPALT  UNITADDRESS(142) LIMITS(200000,300000) DETAIL
```

Using abbreviations, you could have specified:

```
MAPALT  UNITADDR(142) LIM(200000,300000) DTL
```

MAPPING A VOLUME IN THE DOS/VSE ENVIRONMENT: EXAMPLE 3

In this example, a full volume scan is performed on the fixed block architecture device assigned to SYS001. A detailed report is made of each block on the volume that has an alternate assigned, and a summary report is made giving the total number of alternates found.

```
// JOB   jobname
// ASSGN SYS001,140
// EXEC  ICKDSF,SIZE=256K
  MAPALT  SYSNAME(SYS001) ALL DETAIL
/*
/&
```

REFORMAT: REFORMATTING PORTIONS OF A PREVIOUSLY INITIALIZED VOLUME

After a volume has been initialized, it can be reformatted to change the volume serial number, owner identification, and, for count key data devices, IPL bootstrap and program records. Only volumes that have been initialized can be reformatted.

For fixed block architecture devices, a volume can be reformatted to change the volume serial number and owner identification. Only volumes that have been initialized can be reformatted.

The abbreviation for the REFORMAT command is RFMT.

SYNTAX

Command	Required Parameters
REFORMAT	UNITADDRESS(cuu)| DDNAME(dname)| SYSNAME(sysxxx) VERIFY(serial[,owner])| NOVERIFY
	Optional Parameters

	PURGE|NOPURGE
	VOLID(serial)
	OWNERID(owner)
	IPLDD({dname|dlblname}
	[,OBJFORMAT|,ABSFORMAT])
	BOOTSTRAP|NOBOOTSTRAP

UNITADDRESS|DDNAME|SYSNAME: IDENTIFYING THE DEVICE ON WHICH THE VOLUME IS MOUNTED

Explanation: UNITADDRESS(cuu)|DDNAME(dname)|SYSNAME(sysxxx) are required parameters identifying the volume that is to be reformatted.

UNITADDRESS

Required when reformatting a volume that is mounted offline or when reformatting a volume in a stand-alone environment.

For cuu, specify the address in hexadecimal of the channel and unit on which the volume is mounted.

Note: The device must be mounted on a channel that is online. If the device is on a channel that is offline, the program might enter a nonterminating wait state.

DDNAME

Required when reformatting a volume that is mounted online. The device on which the volume is mounted must be online and the volume mounted as PRIVATE with DISP=OLD specified.

For dname, specify the OS/VS JCL DD statement that identifies the device on which the volume is mounted.

SYSNAME

Required when reformatting a volume in the DOS/VSE environment. For sysxxx, specify the SYSNAME specified in the ASSGN system control statement.

Abbreviations:

UNITADDRESS|UNIT
DDNAME|DNAME

Defaults: None.

Restrictions: The UNITADDRESS parameter cannot be specified when reformatting a volume that is mounted online.

The DDNAME parameter cannot be specified when reformatting a volume that is mounted offline or in a stand-alone environment.

VERIFY|NOVERIFY: VERIFYING THE VOLUME SERIAL NUMBER AND OWNER IDENTIFICATION

Explanation: **VERIFY(serial [,owner])|NOVERIFY** are required parameters specifying whether to verify the volume serial number and owner identification before reformatting the volume.

VERIFY

Required when you want to verify the volume serial number and owner identification before reformatting the volume. If the volume serial number or owner identification does not match that found on the volume, the REFORMAT command terminates.

For serial, substitute one to six alphameric characters for the volume serial number.

For owner, substitute one to fourteen alphameric characters for the owner identification.

NOVERIFY

Required when you want to bypass verification of the volume serial number and owner identification.

Abbreviations:

VERIFY|VFY
NOVERIFY|NOVFY|NVFY

Defaults: None.

Restrictions: You cannot verify the owner identification separately from the volume serial number; both the volume serial number and the owner identification must be verified when you want to verify the owner identification.

When you specify the VERIFY parameter and verification fails, execution of the command terminates.

PURGE|NOPURGE: WRITING OVER USER VOLUME LABELS ON A PREVIOUSLY INITIALIZED VOLUME

Explanation: **PURGE|NOPURGE** are optional parameters specifying whether existing user volume labels are to be written over by the specified IPL program.

PURGE

Indicates that you want to write over existing user volume labels during reformatting.

NOPURGE
Indicates that you do not want to write over any user volume labels. If a volume contains user volume labels and the IPLDD parameter is specified, the IPL program record is written following the last user volume label.

Abbreviations:

PURGE|PRG
NOPURGE|NOPRG|NPRG

Defaults: The default is NOPURGE.

Restrictions: The PURGE parameter applies only when the IPLDD parameter is specified.

| This parameter is invalid for fixed block architecture devices.

VOLID: SPECIFYING A NEW VOLUME SERIAL NUMBER

Explanation: **VOLID(*serial*)** is an optional parameter specifying a new volume serial number to be written in the volume label.

For *serial*, substitute one to six alphameric characters for the new volume serial number. If fewer than six characters are specified, the serial number is left-justified and the remainder of the field is padded with blanks (X'40').

Abbreviations: None.

Defaults: When you reformat a volume and do not specify the VOLID parameter, the old volume serial number remains unchanged.

Restrictions: The catalog must be changed to reflect the new volume serial number for any cataloged data sets that reside on the reformatted volume.

OWNERID: SPECIFYING A NEW VOLUME-OWNER IDENTIFICATION

Explanation: **OWNERID(*owner*)** is an optional parameter specifying a new volume-owner identification to be written in the volume label.

For *owner*, substitute one to fourteen alphameric characters for a new volume-owner identification in the volume label.

Abbreviations:

OWNERID|OWNER

Defaults: When a volume is reformatted and a new owner identification is not specified, the old owner identification remains unchanged.

Restrictions: None.

IPLDD: WRITING A USER-SUPPLIED IPL PROGRAM ON THE VOLUME

Explanation: IPLDD({dname|dlblname}[,OBJFORMAT|,ABSFORMAT]) is an optional parameter which allows you to supply an IPL program to replace an existing IPL program or add one to the volume.

This parameter should not be used when reformatting a Mass Storage System staging pack.

The IPLDD and BOOTSTRAP parameters are used to specify one of the following:

- If you do not specify IPLDD, ICKDSF writes special bootstrap records that cause the processing unit to be placed in a WAIT state if the volume is specified during an attempt to load the system.
- If you specify IPLDD but do not specify BOOTSTRAP, ICKDSF supplies an IPL bootstrap which is written on the volume together with the IPL text you supply.
- If you specify IPLDD and BOOTSTRAP, ICKDSF uses the IPL bootstrap and the IPL text you supply. If neccesary, ICKDSF updates the bootstrap records to allow for possible user labels.

The maximum size permitted for the IPL program record depends upon the type of volume being reformatted. The maximum sizes allowed are:

Volume Type	Maximum Bytes for IPL Program
2305-1	12,180
2305-2	13,616
2311	3,110
2314	6,514
2319	6,514
3330	12,117
3330-11	12,117
3340	7,286
3344	7,286
3350	17,902
3375	33,984
3380	44,958

Also, the number of existing user volume labels can further limit the size allowed for the IPL program if you specify the NOPURGE parameter. If you supply an IPL program that exceeds the size allowed, you receive an error message but the reformatting continues.

For dname, substitute 1 to 8 alphameric characters for the DD statement identifying the data set that contains the IPL program you want written on the volume being reformatted. The IPL program can be specified within the OS/VS JCL input stream (SYSIN). If the IPL program is in the OS/VS JCL input stream, the data must be included immediately after the REFORMAT command. For reformatting in a stand-alone environment, the dname must be specified as SYSIN.

For dlblname, substitute 1 to 7 alphameric characters. These represent the file name that appears in the DLBL statement and identify the file that contains the IPL program you want written on the volume being reformatted. The IPL program can be included in the DOS/VSE JCS input stream (SYSIN). It must then be included immediately after the REFORMAT command.

OBJFORMAT

Specifies that IPL data is being supplied in object deck format, that is, cards will have one of the following strings of EBCDIC characters in columns 2 through 4:

```
TXT
RLD
ESD
END
```

Note that only cards with TXT will be processed. All others will be ignored.

OBJFORMAT may be abbreviated as OBJECT or OBJ.

ABSFORMAT

Specifies that IPL data is being supplied in the form of variable-length records that contain executable instructions. When IPL data is supplied in this format, it is necessary to provide a minimum of three records. The maximum number of records supplied and their lengths are only limited by the track capacity of the volume on which these records are to be written.

The first two records supplied must be the bootstrap records and are restricted to lengths of 24 and 144 bytes.

The contents of the IPL records and the contents of the program are not checked by ICKDSF. It is the user's responsibility to ensure that the IPL records can load an executable program. The first IPL record must contain a PSW followed by two CCWs (channel command words). The CCWs should have the following hexadecimal formats:

First CCW	06xxxxxx 60000090
Second CCW	08xxxxxx 00000000

The first CCW is a command to read in the second IPL record at main storage address xxxxxx. The second CCW is a transfer-in-channel command (a branch) to the CCW that begins the second IPL record.

The second IPL record must be 144 bytes long. Bytes 32 through 42 (starting from byte zero) cannot be used. Bytes 32 through 42 are used by ICKDSF for the seek address (bytes 32 through 37) and the CCHHR (bytes 38 through 42) of the third IPL record.

The third through nth records that are supplied are assumed to be IPL program records and will be written on the volume without any modification after the standard volume label and any existing user volume labels. Note that the IPL program will only be written on the first track of the pack. If the records supplied exceed in length the remaining space on the first track, the function will terminate with an error message.

ABSFORMAT may be abbreviated as ABSOLUTE or ABS.

Abbreviations:

IPLDD|IPL

Defaults: If you specify the IPLDD parameter without specifying the BOOTSTRAP parameter, the IPL bootstrap records necessary to transfer control to the IPL program record will be generated automatically.

Restrictions: In a stand-alone environment, you must substitute SYSIN for the dname.

When an IPL program is included in the SYSIN stream, it must immediately follow the REFORMAT command and be terminated by an ENDIPLTEXT card. The ENDIPLTEXT card is optional when the IPL program is in a data set other than the one specified by SYSIN, or when the end-of-file indicator (/*) immediately follows the data for the IPL program.

This parameter is invalid for fixed block architecture devices.

BOOTSTRAP|NOBOOTSTRAP: WRITING IPL BOOTSTRAP RECORDS ON THE VOLUME

Explanation: BOOTSTRAP|NOBOOTSTRAP are optional parameters specifying whether you are supplying the IPL bootstrap records that are to be written on the volume during reformatting.

BOOTSTRAP
Indicates that you are supplying the IPL bootstrap records that are written on the volume during reformatting. These records must be the first four records in the IPL program text. The first text record must have IPL1 in the first four columns, followed by 24 bytes of data. The 24 bytes of data have the same format as the first IPL record described above under ABSFORMAT. The next three text records must have IPL2 in their first four columns, followed by 68 bytes of data each in the second and third records and 8 bytes of data in the last record. The 144 bytes of data have the same format as IPL record 2 described above under ABSFORMAT.

NOBOOTSTRAP
Indicates that you are not supplying IPL bootstrap records and require that the necessary IPL bootstrap records be generated by the Device Support Facilities program.

Abbreviations:

BOOTSTRAP|BOOT

NOBOOTSTRAP|NOBOOT|NBOOT

Defaults: The default is NOBOOTSTRAP.

Restrictions: The BOOTSTRAP and NOBOOTSTRAP parameters apply only when the IPLDD parameter is specified. This parameter is ignored when the IPL program is supplied in absolute format.

This parameter is invalid for fixed block architecture devices.

EXAMPLES OF WAYS TO CODE THE REFORMAT COMMAND

The following examples show different ways to code the REFORMAT command in offline and online mode (OS/VS) and for DOS/VSE. To reformat a volume in a stand-alone environment, take an example given for OS/VS and do the following:

- Eliminate the OS/VS JCL.
- Substitute the UNITADDRESS parameter for the DDNAME parameter.
- Specify the DEVICETYPE parameter.
- Substitute SYSIN for dname in the IPLDD parameter.

Note: Any values specified here are examples only and should not be interpreted as the values for your system.

REFORMATTING A VOLUME TO CHANGE THE VOLUME SERIAL NUMBER IN OFFLINE MODE (OS/VS): EXAMPLE 1

In this example, the volume serial number is being changed. Any catalogs that identify the volume by its old volume serial number must be modified. The VERIFY parameter is specified to ensure that the correct volume is being accessed before the volume serial number is changed.

```
//EXAMPLE1 JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 REFORMAT UNITADDRESS(353) VERIFY(OLDVOL) -
          VOLID(NEWVOL)
/*
```

REFORMATTING A VOLUME TO ADD AN IPL PROGRAM IN ONLINE MODE (OS/VS): EXAMPLE 2

In this example, an IPL program is added to the volume, and the owner identification is changed. If any user volume labels exist on the volume, the IPL program is written over them because the PURGE parameter is specified. The Device Support Facilities program will supply the appropriate IPL bootstrap records.

```
//EXAMPLE2 JOB
//         EXEC  PGM=ICKDSF
//IPLDECK  DD    *
•
•
•
//VOLUMEL  DD    UNIT=3330,DISP=OLD,VOL=SER=VOL123
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 REFORMAT DDNAME(VOLUMEL) IPLDD(IPLDECK) -
          OWNERID(BROWN) PURGE NOVERIFY
/*
```

REFORMATTING A VOLUME TO CHANGE THE VOLUME SERIAL NUMBER (DOS/VSE): EXAMPLE 3

In this example, the volume serial number is verified and a new volume serial number is assigned.

```
// JOB       jobname
// ASSGN     SYS010,151
// EXEC      ICKDSF,SIZE=AUTO
   REFORMAT  SYSNAME(SYS010) VERIFY(OLDVOL) VOLID(NEWVOL)
/*
/&
```

REFORMATTING A FIXED BLOCK ARCHITECTURE VOLUME TO CHANGE THE VOLUME SERIAL NUMBER (DOS/VSE): EXAMPLE 4

In this example, the volume serial number and owner ID are verified and a new volume serial number and owner ID are assigned.

```
// JOB       jobname
// ASSGN     SYS010,380
// EXEC      ICKDSF,SIZE=AUTO
   REFORMAT  SYSNAME(SYS010) VERIFY(OLDVOL,SMITH) -
             VOLID(NEWVOL) OWNERID(JONES)
/*
/&
```

REFORMATTING A FIXED BLOCK ARCHITECTURE VOLUME TO CHANGE THE VOLUME SERIAL AND BLANK OUT THE OWNER-ID (DOS/VSE): EXAMPLE 5

In this example, the volume serial number and owner ID are verified, a new volume serial number is assigned, and the owner ID is blanked.

```
// JOB      jobname
// ASSGN    SYS011,381
// EXEC     ICKDSF,SIZE=AUTO
   REFORMAT SYSNAME(SYS011) VERIFY(OLDVOL,JONES) -
            VOLID(NEWVOL) OWNERID('b')
/*
/&
```

where the b in 'b' is a blank character.

Figure 8 shows the general layout of a disk pack in count key data format, from the lowest-numbered cylinder and track through the highest-numbered cylinder and track.

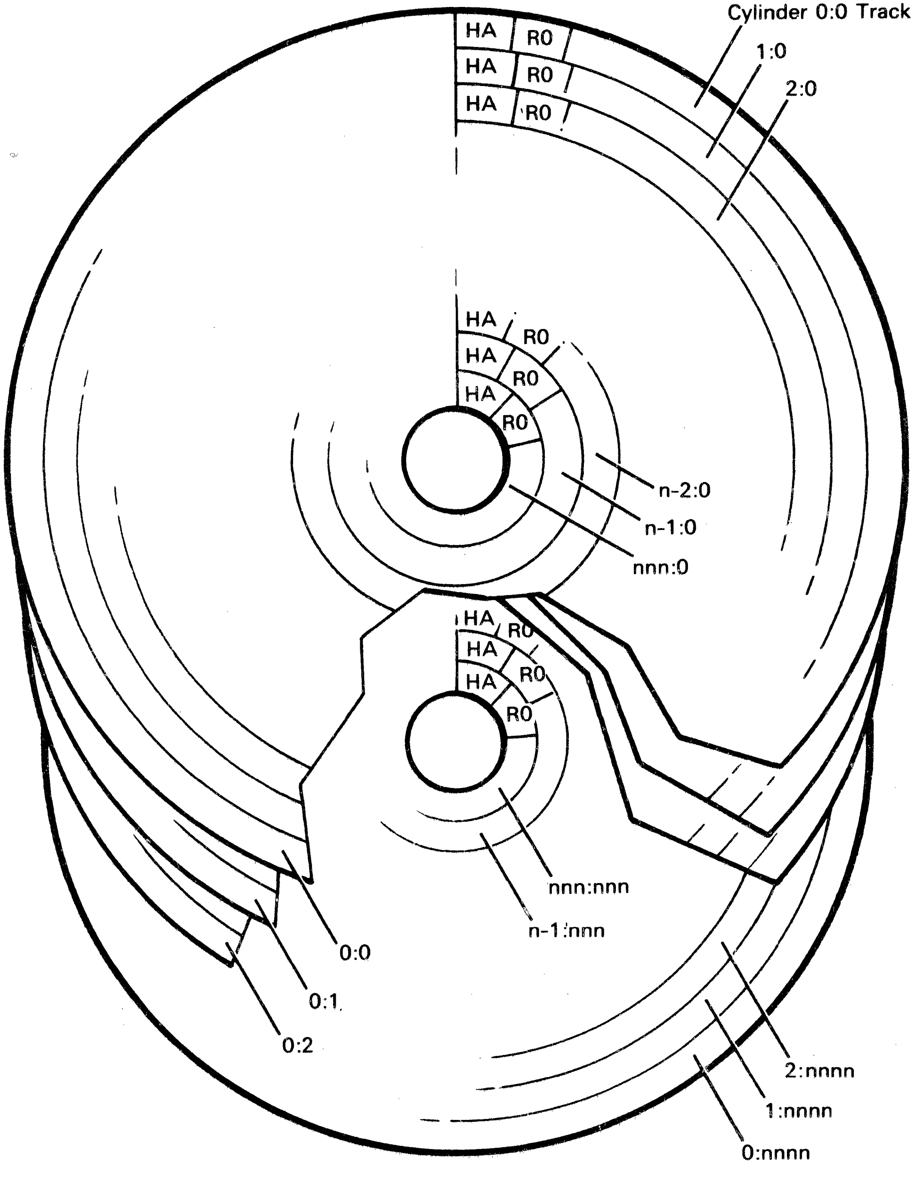


Figure 8. General Volume Layout (Count Key Data Devices)

Figure 9 on page 89 shows that, immediately after its index point, each track on a count key data device begins with a home address that describes the track type and condition. The home address is followed by a record 0 that links defective primary tracks with their associated alternate tracks. After the home address and record 0, there are zero or more keyed or nonkeyed user-written records. (The 2305 Fixed Head Storage Models 1 and 2 do not have home address records.)

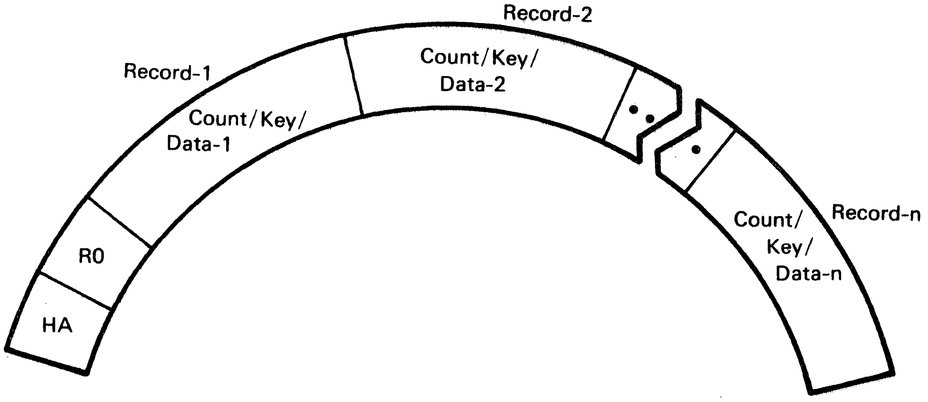


Figure 9. Standard Track Layout (Count Key Data Devices)

Figure 10 shows an example of the volume map that can be received after processing a volume with Device Support Facilities with either the INIT or INSPECT command.

```
ICKDSF  DEVICE SUPPORT FACILITIES      TIME: 09:14:01     05/17/78     PAGE 1

  INIT DDNAME(INPUT) PURGE CHECK(1) VTOC(0,10,10) VOLID(NEWVOL) NOVERIFY

•
•
•

ICK01307I DEFECTIVE-TRACK LIST IN HEXADECIMAL FOR VOLUME NEWVOL

ICK01308I THE FOLLOWING PRIMARY TRACKS WERE FOUND DEFECTIVE:

  CCHH OF TRACK -- CCHH OF ALTERNATE -- FLAGGED DEFECTIVE -- TRACK CONDITION
    00D4 0008         0328 0000                YES              DEFECTIVE
    00DB 0008         0328 0001                YES              DEFECTIVE
    0189 0000         0328 0002                YES              DEFECTIVE
    018C 0011         0328 0003                YES              DEFECTIVE
    020F 0005         0328 0004                YES              DEFECTIVE
    0224 000D         0328 0005                YES            NOT-DEFECTIVE
    027B 000E         0328 0006                YES              DEFECTIVE
    02CE 0003         0328 0007                YES            NOT-DEFECTIVE
    0307 000A         0328 0008                YES              DEFECTIVE

ICK01309I THE FOLLOWING ALTERNATE TRACKS WERE FOUND DEFECTIVE:

  CCHH OF TRACK -- CCHH OF PRIMARY ---- FLAGGED DEFECTIVE -- TRACK CONDITION
    032B 000D         032B 000D                YES              DEFECTIVE

ICK01313I VOLUME CONTAINS   133 ALTERNATE TRACKS --   123 AVAILABLE.

ICK01314I VTOC IS LOCATED AT CCHH=X'0000 000A' AND IS     10 TRACKS.

ICK00001I FUNCTION COMPLETED. HIGHEST CONDITION CODE WAS 0
```

Figure 10. Volume Map Output (Count Key Data Devices)

Legend for the volume map:

1. Message ICK01307I is the first line of the volume map; it identifies the volume serial number for which the map is produced.

2. Message ICK01308I is printed as the second line of the volume map when one or more defective primary tracks were found.

   Note: Only as a result of medial and maximal initialization will all defective tracks be listed in the volume map. Minimal initialization and the INSPECT command result in a list of only those tracks that were checked during execution of the respective command, namely, the alternate tracks and the individual tracks inspected, respectively. Some of the tracks listed may not be defective, because the list may include tracks that are marked defective because of unconditional assignment of alternate tracks.

3. Four columns of information are provided:

   CCHH OF TRACK: The hexadecimal track address of the defective primary track.

   CCHH OF ALTERNATE: The hexadecimal track address of the alternate track assigned to the primary track. If a primary track is marked defective but does not have an associated alternate track, this column contains the primary track address.

   FLAGGED DEFECTIVE: A YES indicates that the home address flag byte has its defective-track flag on; a NO indicates that the defective-track flag is off.

   TRACK CONDITION: This column is printed only if the CHECK parameter was specified with the command or if an unrecoverable track was found. DEFECTIVE indicates that the track could not be read without a DATA CHECK occurring. NOT-DEFECTIVE indicates that the track could be read and written without difficulty. The NOT-DEFECTIVE condition appears only when the RECLAIM parameter is not specified, and indicates that the defective-track flag was on and, although the track did not appear to have defects, it was not reclaimed. UNRECOVERABLE indicates that surface checking could not be performed because I/O errors occurred, that prevented either the home address or the record 0 from being written on the track.

4. Message ICK01309I appears when one or more alternate tracks are found defective. The same information is provided for alternate tracks as is provided for primary tracks, but the second column identifies the primary track associated with the alternate track.

   Note: In some cases, the track address for the primary track is the same track address as that for the alternate track, which indicates that the alternate track is not associated with a primary track. When an alternate track is found unrecoverable, the "FLAGGED DEFECTIVE" column is blank, and the primary track address is set to NONE.

5. Message ICK01313I indicates the number of alternate tracks defined for the volume and the number of alternate tracks that are neither defective nor assigned.

6. Message ICK01314I identifies the track address where the volume table of contents begins and the number of tracks reserved for it.

Figure 11 shows the contents of cylinder 0, track 0 after the volume has been initialized. The first track of the first cylinder is reserved for system-defined records:

- Home address and record 0
- IPL bootstrap records
- Volume label
- Optional user-volume labels
- Optional IPL program

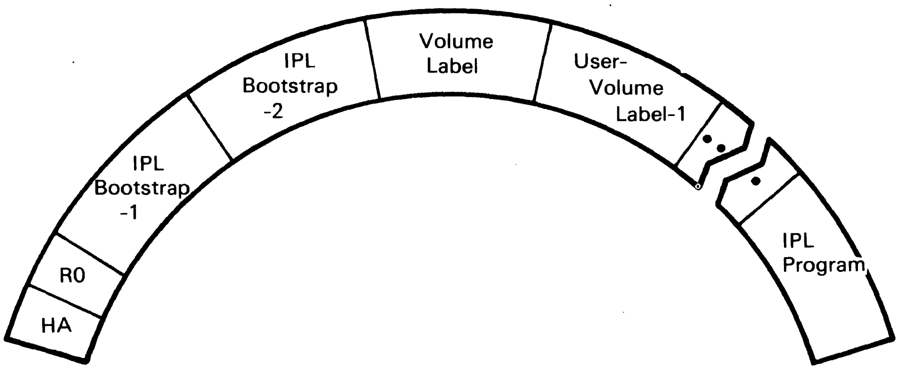


Figure 11. Cylinder 0, Track 0 Layout (Count Key Data Devices)

Figure 12 shows how the primary and alternate track associations are recorded on the volume.

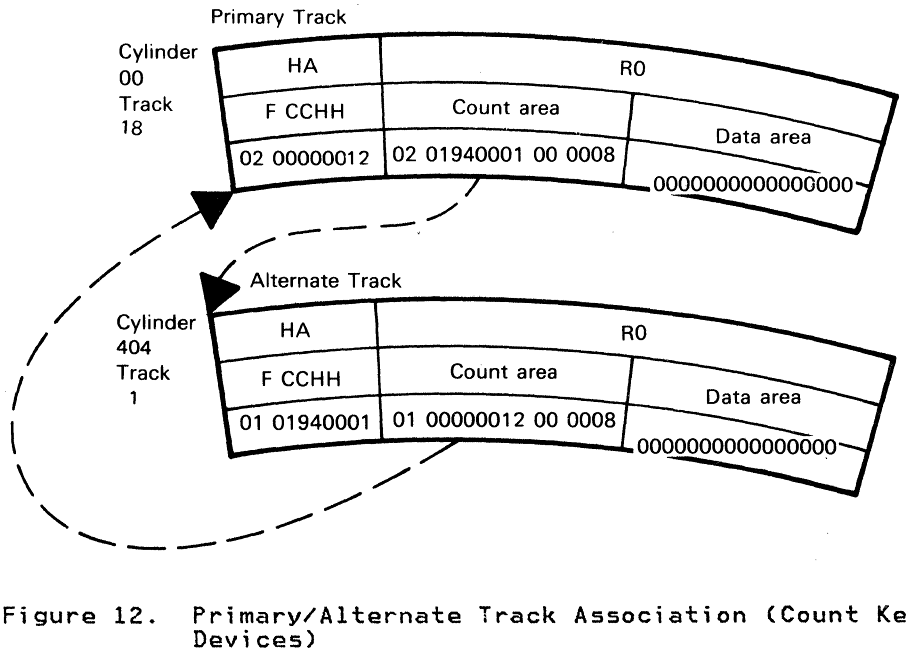


Figure 12. Primary/Alternate Track Association (Count Key Data Devices)

Figure 13 shows the contents of the IPL bootstrap records as the system supplies them. Each bootstrap record has a count area and a 4-byte key area. The key of the first record is IPL1, and the count area indicates that its data area is 24 bytes long. The key of the second record is IPL2, and the count area indicates that its data area is 144 bytes long. Bootstrap record 1 causes bootstrap record 2 to be read, and bootstrap record 2 causes the IPL program to be read. The IPL program contains user-defined values.

IPL Bootstrap Record 1:

00000000 00000000	PSW	
06003A98 60000060	CCW:	Read
08003A98 00000000	CCW:	TIC

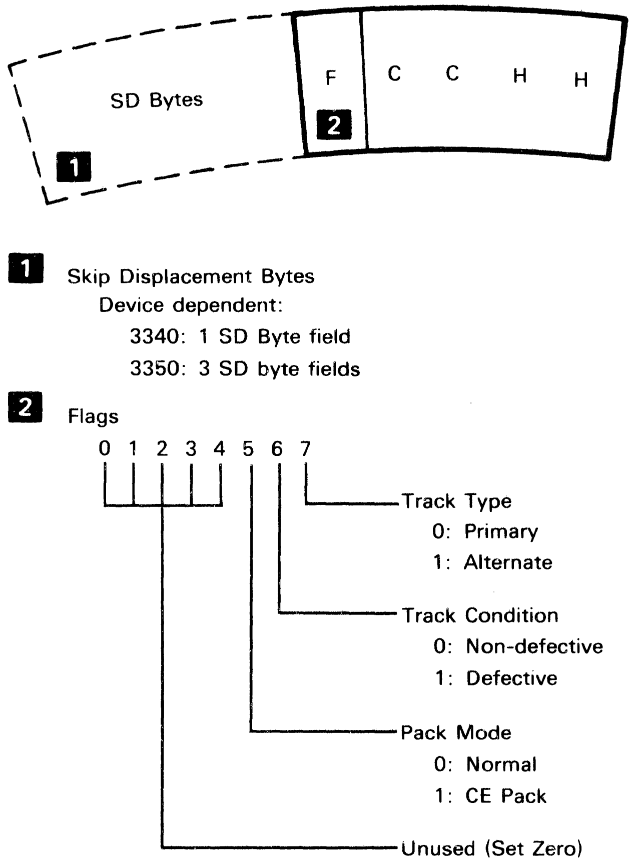
IPL Bootstrap Record 2:

07003AB8 40000006	CCW:	Seek
31003ABE 40000005	CCW:	Search Id Equal
08003AA0 00000000	CCW:	TIC
06000000 20000000	CCW:	Read
000000000000	Seek Address—00	
0000000004	Search Address—R 4	
0000000000000000	Padding	
0000000000000000	(101 Bytes)	

Figure 13. IPL Bootstrap Records

Figure 14 shows the format of the home address on each track. When a volume is initialized, the flags for each track are set as indicated in the figure.

The skip-displacement bytes appear as part of the home address record on each track for 3340 direct access storage facility and 3350 direct access storage devices only. The home address on each track for the other supported devices begins with the flag byte.



1 Skip Displacement Bytes
Device dependent:
3340: 1 SD Byte field
3350: 3 SD byte fields

2 Flags

Track Type
0: Primary
1: Alternate

Track Condition
0: Non-defective
1: Defective

Pack Mode
0: Normal
1: CE Pack

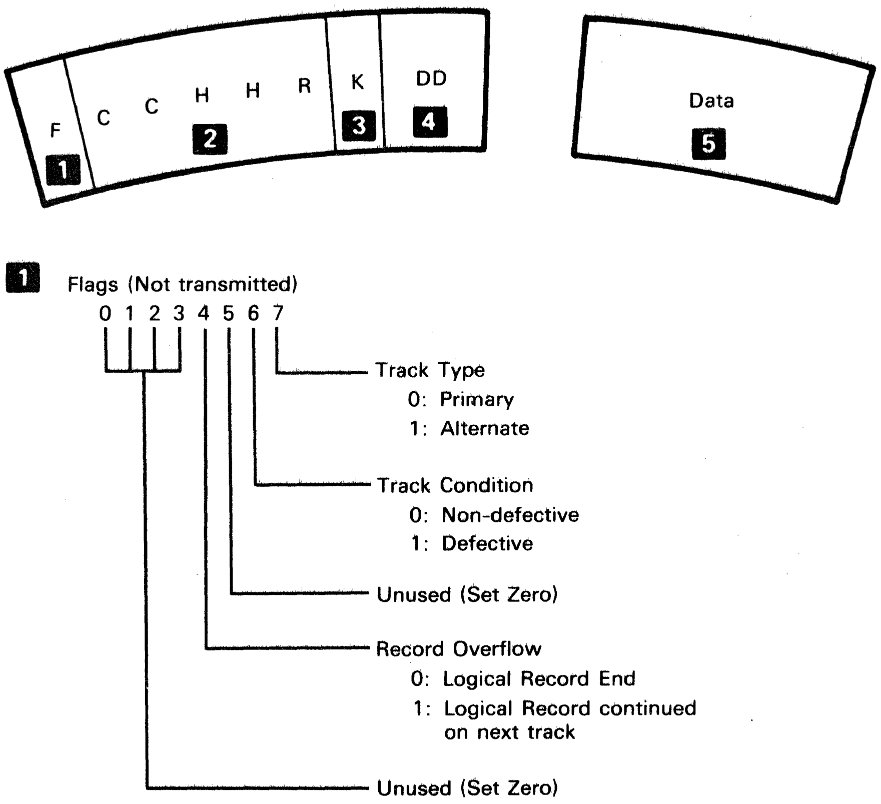
Unused (Set Zero)

Figure 14. Standard Home Address Format (Count Key Data Devices)

Figure 15 shows the format of record 0. When a volume is initialized, the record 0 is written immediately following the home address on each track. Record 0 contains a flag byte, a track address, its key length, and its data length. The flag bits are set as indicated in the figure.

The record 0 on each primary track contains its own track address unless it has been assigned an alternate track. If the primary track has been assigned an alternate track, the assigned alternate track address is written in the primary track's record 0.

The record 0 on each alternate track contains its own track address unless it has been assigned to a primary track. If the alternate track has been assigned to a primary track, the assigned primary track address is written in the alternate track's record 0.



2 Track Address of self-same track, or of associated Alternate or Primary (the R value is always zero)

3 Key-length Always zero (0)

4 Data-length Always eight (8)

5 Data-Area Always eight bytes: binary zeros when initialized by ICKDSF

Figure 15. Standard Record 0 Format (Count Key Data Devices)

APPENDIX B. MINIDISK SUPPORT

This appendix explains only minidisk support. A VM/370 user is able to initialize or inspect either a real disk or a virtual disk (VM minidisk). Initialization of a partial disk as an OS minidisk in the VM/370 environment is available only in the stand-alone environment. The following devices are supported as minidisks:

2314, 2319, 2305-1, 2305-2, 3310, 3330, 3330-11, 3330V, 3340, 3344, 3350, 3370, 3375, and 3380.

- 2305/3330/3330V/3340/3350/3375/3380 DASD Devices

  The only level of initialization provided is minimal initialization. A volume label, VTOC, and, optionally, IPL records can be written. Alternate tracks are not provided.

  Pack inspection is not allowed on these devices, as writing of home-addresses and standard-length record zeros is inhibited on these devices in the VM environment.

- 2314/2319 DASD Devices

  Minimal, medial, and maximal initialization are provided. The last cylinder of the 2314 minidisk is always reserved for use as an alternate track cylinder. Therefore, a 2314 minidisk will always have a minimum of 2 cylinders. The initialization function uses the last cylinder of the minidisk as an alternate track cylinder.

  All the functions provided by the INSPECT command are available for a 2314/2319 minidisk.

  To specify the number of cylinders in the INIT and INSPECT commands for an OS minidisk in the VM environment use:

  ```
  MIMIC(MINI(n))
  ```

  where n = number of cylinders

  Note: For 2305/3330/3330V/3340/3350/3375/3380 devices, "n" determines the actual amount of space on that volume, that is, reflected in the VTOC's DSCB Format-4 record. For 2314, the last cylinder is always reserved as the alternate track cylinder. Therefore, only "n-1" cylinders are available as primary cylinders, that is, reflected in the VTOC's DSCB Format-4 record.

- 3310/3370 Fixed Block Architecture (FBA) DASD Devices

  The only level of initialization supported is minimal. Volume labels and a fixed block architecture VTOC can be written. No surface checking or alternate block assignment is provided.

  Do not specify the MIMIC parameter when you initialize 3310 or 3370 volumes.

APPENDIX C. DEVICE SUPPORT FACILITIES MESSAGES (ICK)

This appendix contains all Device Support Facilities messages with the ICK prefix.

For ease of reference, you might want to remove this appendix from the publication and insert it in one of the following publications:

- VSE/Advanced Function Messages, SC33-6098, if you use Device Support Facilities in a VSE environment
- OS/VS Message Library: VS1 System Messages, GC38-1001, if you use Device Support Facilities in a VS1 environment
- OS/VS Message Library: VS2 System Messages, GC38-1002, if you use Device Support Facilities in an MVS environment

INTRODUCTION

Messages are detailed as fully as possible to permit you to understand a condition and to take necessary action. Information for each message includes, when appropriate:

- Explanation: What the message means, why it appears, what caused it, what its variable fields are.
- System Action: What is happening as a result of the condition causing the message. For example, is the system waiting for responses.
- Operator and/or Programmer Response: If a response is necessary, who performs it, what the pertinent responses are, and their effect on the system or program.
- Problem Determination: If the problem recurs or is persistent to the point that system efficiency suffers, what actions can be performed to obtain adequate data for trained hardware or programming support personnel to diagnose the problem.

The last item, problem determination, will often refer to the tabular listing of problem determination actions in Appendix D. These common action tables do not teach diagnostic techniques, but instruct the operator or programmer what to do when problems recur. The problem determination actions are aids to identify hardware or programming problems and they ensure that support personnel have the essential programming information available to diagnose and correct the difficulty.

MESSAGE ROUTING AND DESCRIPTOR CODES

Routing codes provide the ability to route system operator messages to selected funtional areas.

Device Support Facilities messages will be routed to default functional areas as defined by a specific installation or, in the absence of such definition, they will be routed to the master console.

The descriptor codes will always indicate system status.

Component Name

ICK

Program Producing Message

Device Support Facilities

Audience and Where Produced

For operator: the operator's console. For system programmer: printed output.

Message Format

ICK s nnnn t text or ICK nnn t text

s

Condition code indicating severity of message received at the output printer. Messages received at the console do not have a condition code indicating severity.

0 Information: no effect upon execution
1 Warning: function might fail
2 Error: function probably failed
3 Serious Error: function failed
4 Terminal error: Device Support Facilities processor terminated

It is possible to determine which of several messages issued during execution of a command results in a specific condition code value: The highest condition code multiplied by four yields the command's setting of the LASTCC.

nnnn or nnn

Message serial number: four digits for printed messages, and three digits for messages that appear at the operator's console.

t

Type code:

I Informational, no action required
E Eventual action required
D Decision required, processing waiting
A Operator action required

text

Message text

** Indicates a 'second-level' message that further explains a preceding message. The track addresses (cccc:hhhh) in message text appear in hexadecimal format.

Associated Publications

None

Problem Determination

If the problem recurs, perform the problem determination actions to ensure that qualified support personnel will have the essential programming information available to diagnose and correct the difficulty. Refer to Appendix D for problem determination instructions.

MESSAGES RECEIVED AT THE CONSOLE

ICK001D CONFIRM PURGING OF UNEXPIRED DATA SETS, REPLY U TO PURGE, ELSE T

Explanation: Before processing starts, if one or more unexpired data sets have been found, the operator is requested to confirm that the volume contents may be destroyed.

System Action: Device Support Facilities waits for the operator's response.

Operator Response: Respond U to permit unconditional purging of the data set; or respond T to prohibit purging and to terminate the function.

Programmer Response: None.

Problem Determination: Not applicable.

ICK002D ERROR IN REPLY, REPLY 'U' OR 'T'

Explanation: When replying to messages whose only acceptable response is U or T, the operator responded with another character. Any other character will cause this request for reentry to be made.

System Action: Device Support Facilities waits for the operator's response.

Operator Response: Respond with U for unconditional purging, or T to terminate.

Programmer Response: None.

Problem Determination: Not applicable.

ICK003D REPLY 'U' TO ALTER VOLUME cuu CONTENTS, ELSE 'T'

Explanation: When processing the volume cuu offline, the operator is requested to confirm the processing because the offline volume is not checked by the operating system, and data on the volume might be lost or modified. Depending on the command and parameter used, this data might be as little as the volume serial (REFORMAT command with VOLID parameter), a track (INSPECT with NOPRESERVE), or the whole volume (INIT with CHECK).

System Action: Device Support Facilities waits for operator's reply.

Operator Response: Respond U to proceed with command processing; respond T to terminate the command.

Programmer Response: None.

Problem Determination: Not applicable.

ICK004D READY DEVICE cuu AND REPLY 'U', ELSE 'T'

Explanation: The device cuu is not in the READY state.

System Action: Device Support Facilities waits for the operator's response.

Operator Response: Ensure that the device is in the READY state, and respond U to continue processing the command or respond T to terminate the command.

Programmer Response: None.

Problem Determination: Not applicable.

ICK005E DEFINE INPUT DEVICE: 'xxxx,cuu' or 'CONSOLE'

Explanation: xxxx is the device type and cuu is the channel and unit address. This message appears only in a stand-alone environment. The operator must specify the device type and location of the command input stream.

System Action: Device Support Facilities waits for the operator's response.

Operator Response: Specify the input device type and its channel and unit address.

Programmer Response: None.

Problem Determination: Not applicable.

ICK006E DEFINE OUTPUT DEVICE: 'xxxx,cuu' or 'CONSOLE'

Explanation: xxxx is the device type and cuu is the channel and unit address. This message appears only in a stand-alone environment. The operator must specify the device type and the location of the printed output.

System Action: Device Support Facilities waits for a reply.

Operator Response: Specify the output device type and its channel and unit address.

Programmer Response: None.

Problem Determination: Not applicable.

ICK007E **INVALID INPUT DEVICE SPECIFIED**

Explanation: This message appears only in a stand-alone environment. The operator specified an invalid device type to message ICK005E.

System Action: Device Support Facilities repeats message ICK005E.

Operator Response: Specify a correct input device type.

Programmer Response: None.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK008E **INVALID OUTPUT DEVICE SPECIFIED**

Explanation: This message appears only in a stand-alone environment. The operator specified an invalid device type to message ICK006E.

System Action: Device Support Facilities repeats message ICK006E.

Operator Response: Specify a correct output device type.

Programmer Response: None.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK009I **SVC INTERRUPT OCCURRED**

Explanation: This message appears only in a stand-alone environment. Probable program error. The SVC instruction cannot be used in a stand-alone environment.

System Action: Device Support Facilities terminates.

Operator Response: Notify the system programmer.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK010I **PROGRAM INTERRUPT OCCURRED**

Explanation: This message appears only in a stand-alone environment. Probable program error. An instruction executed incorrectly.

System Action: Device Support Facilities terminates.

Operator Response: Notify the system programmer.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK011E **I/O ERROR -- error-type, cuu, command, csw, sense**

Explanation: This message appears only in a stand-alone environment. An I/O error of the type indicated occurred on the device at address cuu. The command in error is indicated as are the contents of the channel status word (CSW) and the results of a sense operation against the device.

System Action: Device Support Facilities terminates.

Operator Response: None.

Programmer Response: Correct the cause of the error, and restart Device Support Facilities.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK012E **INTERVENTION REQUIRED, cuu**

Explanation: This message appears only in a stand-alone environment. The indicated device is not in the READY state.

System Action: Device Support Facilities waits for correction of the problem.

Operator Response: Ensure that the device is in a READY state.

Programmer Response: None.

Problem Determination: Not applicable.

ICK013E **CONSOLE READ FAILED, REENTER LAST LINE**

Explanation: This message appears only in a stand-alone environment. An I/O error occurred when attempting to read a line that was entered at the operator's console.

System Action: Device Support Facilities waits for the line to be reentered.

Operator Response: Reenter the line.

Programmer Response: None.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK014D SET DEVICE cuu IN WRITE-MODE AND REPLY 'U', ELSE 'T'

Explanation: The device at address cuu is set in read-only mode.

System Action: Device Support Facilities waits for operator's response.

Operator Response: Set the device to allow write operations and reply U. If write operations cannot be allowed, reply T, and the command terminates.

Programmer Response: None.

Problem Determination: Not applicable.

ICK015E TODAY'S DATE, REPLY 'mm/dd/yy'

Explanation: This message appears only in a stand-alone environment. If you want the date to appear as part of the output title line, respond with the month, day, and year as indicated; otherwise, press the ENTER key.

System Action: The date appears in the title line of the output listing, or blanks are substituted if a date was not supplied.

Operator Response: Respond with the month, day, and year if you want the date to appear in the title line of the output listing. If you do not want the date, respond by pressing the ENTER key.

Programmer Response: None.

Problem Determination: Not applicable.

ICK016E SUPPLY TIME OF DAY, REPLY 'hh:mm:ss'

Explanation: This message appears only in a stand-alone environment. If you want the time of day to appear in the title line of the output listing, respond with the hour, minute, and second as indicated; otherwise, respond by pressing the ENTER key.

System Action: The time of day appears in the title line of the output listing, or blanks are substituted if a time of day was not specified.

Operator Response: Respond by specifying the hour, minute, and second if you want the time of day to appear in the title line of the output listing. If you do not want it to appear, respond by pressing the ENTER key.

Programmer Response: None.

Problem Determination: Not applicable.

ICK017D filename IS A SECURED FILE

Explanation: The specified 'filename' is a data-secured file and Device Support Facilities requests permission to purge this file in an associated message, ICK018D.

System Action: Processing continues, as the message is informational only.

Operator Response: None.

ICK018D CONFIRM PURGING OF SPECIFIED FILE NAME, REPLY U TO PURGE, ELSE T

Explanation: The filename is displayed in message ICK017D and permission is being requested to purge the filename specified in message ICK017D.

System Action: Processing continues after the correct reply is obtained from the operator. If the operator replies T, the command terminates and Device Support Facilities continues processing with the next command. If the operator replies U, processing of the command continues.

Operator Response: The operator must reply to this message with either U or T.

Programmer Response: None.

ICK019D CONFIRM PURGING OF ALL VSAM FILES, REPLY U TO PURGE, ELSE T

Explanation: Permission is being requested to purge all VSAM files in the DOS/VSE environment. Note that this message is issued once only (upon discovery of the first VSAM file on the volume).

System Action: Processing continues after the correct reply is obtained from the operator. If the operator replies T, the command terminates and Device Support Facilities continues processing with the next command. If the operator replies U, processing of the command continues.

Operator Response: The operator must reply to this message with either U or T.

Programmer Response: None.

ICK020D DEVICE cuu IS SHARED. REPLY U OR T

Explanation: The volume addressed by the "cuu" is being shared, and Device Support Facilites requests permission to operate on the subject volume.

System Action: Processing continues after the correct reply is obtained from the operator. If the operator replies T, the command terminates and Device Support Facilities continues processing with the next command. If the operator replies U , processing of the command continues.

Operator Response: The operator must reply to this message with either U or T.

Programmer Response: None.

ICK057I INVALID DEVICE TYPE: VTOC INDEX NOT SUPPORTED ON THIS DEVICE

Explanation: The device type is not a valid device type for initialization with a VTOC index.

System Action: The creation of the VTOC index is not attempted. INIT command processing continues.

Operator Response: None.

Programmer Response: None.

ICK058I cuu I/O ERROR DETECTED DURING INDEX CREATION: ERROR CODE= *

Explanation: An I/O error occurred during VTOC index creation processing. Error codes:

1 - Error occurred reading volume label
2 - Error occurred reading VTOC
3 - Error occurred writing VTOC
4 - Error occurred writing index records
5 - Index extent violated; increase index size

System Action: VTOC index creation processing is terminated. The DOS volume indicator is turned on in the VTOC. INIT command processing continues.

Operator Response: Refer the error indication to the system coordinator for problem determination.

Programmer Response: None.

ICK059I INDEX STARTING LOCATION INVALID AS SPECIFIED

Explanation: The INDEX parameter on the INIT command statement is invalid. The starting location, as specified, is not valid for one of the following reasons:

1. It caused an overlap with the VTOC.
2. It defined cylinder zero, track zero as the starting location of the index data set.
3. It was outside the physical limits of the device.
4. The relative track specified is invalid for the device.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Check the values specified for the INDEX parameter and correct the value in error. Resubmit the job.

ICK061I cuu VTOC INDEX CREATION SUCCESSFUL: VOLUME NOW IN INDEX FORMAT

Explanation: The VTOC index was successfully created on the volume.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK062I cuu VTOC INDEX CREATION FAILED: RETURN CODE= 8

Explanation: Index creation was unsuccessful.

System Action: None.

Operator Response: None.

Programmer Response: Check the job output for additional information on the reason for job failure.

ICK400I cuu ANALYZE STARTED

Explanation: ANALYZE has started to execute its tests on the logical volume identified in the message (that is, on the volume whose unit address is cuu).

System Action: Processing continues.

Operator Response: None

ICK401I cuu SUSPECTED DRIVE PROBLEM

Explanation: During the drive tests, ANALYZE detected an error. During the data verification test, ANALYZE detected an error other than data check.

System Action: ANALYZE processing terminates, and message ICK406I (ICK01406I) is issued.

Operator Response: Depending on your installation's procedures, you might do the following:

- Restore the entire volume to another drive from a backup volume.
- Discontinue using the drive.

Save the console output and ANALYZE's printer output, which contain further information about the hardware problems.

Take the action appropriate to your installation's procedures for handling suspected equipment problems. If the problem recurs, contact your IBM Customer Engineer or Service Representative.

ICK402I cuu ERROR READING DATA

Explanation: ANALYZE detected data checks while reading data. This message is followed on the printer by a message that identifies the track and cylinder number on which each data check occurred. The cause of the problem could be a damaged disk surface or an intermittent read/write circuitry failure.

System Action: ANALYZE processing terminates, and message ICK406I (ICK01406I) is issued.

Operator Response: Depending on your installation's procedures, you might do one of the following:

- Restore the entire volume from a backup volume.
- Rebuild the track that has the error.
- Assign an alternate track and then restore the track.
- Rebuild the data set.

Save the console output and ANALYZE's printer output, which contain further information.

Problem Determination: Table I, items 1, 2, 3, 4, 30.

ICK403I cuu DATA SCAN VALUES INVALID, TESTING TERMINATED

Explanation: The relative block number(s), tracks, or cylinders specified by the LIMITS parameter are invalid.

System Action: Data verification is not done.

Operator Response: Specify valid relative block number(s), tracks, or cylinders in the LIMITS parameter and resubmit the request.

ICK404I cuu VOLUME HAS UNFORMATTED DATA BLOCKS

Explanation: An attempt was made to read a data block which was not initialized (data field not written).

System Action: After 504 data checks, the ANALYZE command is terminated.

Operator Response: Perform appropriate procedures to recover all desired data from the volume and then run the DOS utilities INTDK or INTDSK with the 'IQ' option to initialize all data blocks.

ICK405I cuu ALL DATA 'MACHINE READABLE' WITHOUT ERRORS

Explanation: The volume was successfully read during the data verification test (SCAN option).

System Action: ANALYZE processing terminates normally, and message ICK406I (ICK01406I) is issued.

Operator Response: None. (If a data problem prompted you to run ANALYZE, and if the problem persists, further analysis is needed according to your installation's procedures.)

ICK406I cuu ANALYZE ENDED

Explanation: ANALYZE has completed processing.

System Action: ANALYZE processing terminates.

Operator Response: None.

ICK407I cuu NO DRIVE PROBLEMS FOUND

Explanation: ANALYZE successfully completed executing the drive tests and did not detect any problems.

System Action: If the SCAN option was specified or defaulted, ANALYZE processing continues with the data verification test. Otherwise, ANALYZE processing terminates, and message ICK406I (ICK01406I) is issued.

Operator Response: None. (If a data problem prompted you to run ANALYZE, and if the problem persists, run the data verification test. If a drive problem prompted you to run ANALYZE, and if the problem persists, further analysis is needed according to your installation's procedures.)

ICK408I cuu DATA VERIFICATION TEST STARTED

Explanation: ANALYZE has started to execute its data verification tests.

System Action: Processing continues.

Operator Response: None.

ICK410I MAIN STORAGE NOT AVAILABLE, TESTING TERMINATED

Explanation: Dynamic acquisition of storage for work areas and control blocks failed.

System Action: ANALYZE command processing is terminated.

Operator Response: Increase main storage size.

ICK411I INCORRECT DEVICE TYPE, TESTING TERMINATED

Explanation: The device type specified for the ANALYZE volume is not supported by ANALYZE.

System Action: ANALYZE processing is terminated.

Operator Response: See Figure 2 on page 4 for valid device types.

ICK412I DEVICE NOT READY, TESTING TERMINATED

Explanation: A condition occurred which caused "Intervention Required" to be posted in the failing CSW sense byte.

System Action: The ANALYZE command is terminated.

Operator Response: Ready the drive, and reissue the command.

ICK413I DATA FORMAT UNACCEPTABLE, TESTING TERMINATED

Explanation: Data on the cylinder is written in a format other than the IBM standard format, or an intermittent drive error occurred during the data verification test, or the volume under test was accessed by another program that erased an EOD record after it was read by the data verification test and before it was reread by the test.

System Action: ANALYZE processing is terminated.

Operator Response: None.

ICK414I WRITE INHIBIT SWITCH ON, WRITE TESTS BYPASSED

Explanation: An error is detected when ANALYZE attempts to write a record and fails because the "R/W" or "READ" switch is in the "READ" position, or the "READ/WRITE" switch position is defective.

System Action: All tests that attempt to write on the CE cylinder are bypassed.

Operator Response: Set the "READ/WRITE" switch in "WRITE" mode.

ICK415I INVALID UNITADDRESS, SYSNAME OR DDNAME SPECIFIED

Explanation: The channel and unit addresses specified do not exist in the system I/O configuration, or the DDNAME is incorrect, or the SYSNAME is incorrect.

System Action: ANALYZE command processing is terminated.

Operator Response: Correct the values specified for "cuu" in the UNITADDRESS parameter, or correct the DDNAME specified, or correct the SYSNAME specified, then reissue the command.

ICK416I UNABLE TO OPEN VOLUME

Explanation: The volume that was specified cannot be OPENed. The DD statement could be missing or invalid, or the channel and unit address could be invalid.

System Action: The ANALYZE command is terminated.

Operator Response: Correct the error, and reissue the command.

ICK417I WRITE TESTS BYPASSED

Explanation: A bad home address on the CE cylinder was detected while trying to verify positioning of the access mechanism.

System Action: All write-dependent tests are bypassed.

Operator Response: None.

Problem Determination: Table I, items 2, 3, 4, 30.

ICK501I INVALID DEVICE TYPE SPECIFIED FOR BUILDIX COMMAND

Explanation: A request was made to change the format of a VTOC on a volume whose device type is not supported by the BUILDIX command (for example, a 2314 DASD).

System Action: Execution of the command is terminated.

Operator Response: None.

ICK502I BUILDIX FUNCTION STARTED

Explanation: Execution of the BUILDIX command has begun.

System Action: None.

Operator Response: None.

ICK503I cuu REQUEST RECEIVED TO CONVERT VTOC TO **FORMAT

Explanation: This message verifies the request for a change of VTOC format. '**' specifies the format requested—either OS or IX.

System Action: Execution of the command continues.

Operator Response: None.

ICK504I cuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST ACCEPTED

Explanation: This message verifies that the BUILDIX function specified on the command statement is valid for the current format of the VTOC on the volume. '**' identifies the format of the VTOC, either OS or IX.

System Action: Execution of the command continues.

Operator Response: None.

ICK505I cuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST REJECTED

Explanation: The format of the VTOC is currently the same as the format requested in the BUILDIX command statement. '**' identifies the format of the VTOC, either OS or IX.

System Action: Execution of the command is terminated.

Operator Response: None.

ICK508A cuu SHOULD VTOC CONVERSION PROCEED? REPLY "U" TO CONTINUE, ELSE "C"

Explanation: This message permits the operator to verify that the user is authorized to request the BUILDIX function before execution of the command begins.

System Action: The system will wait for the operator's reply.

Operator Response: Verify that the user is authorized to issue the command, and reply 'U' to continue. Any reply other than 'U' will be interpreted as a cancellation request.

ICK509I cuu DIRF FLAG SET IN VTOC, BUILDIX CANNOT PROCEED

Explanation: An error occurred during VTOC processing on a previous job, causing the DADSM interrupt flag to be set in the VTOC. The VTOC is not accurate.

System Action: Execution of the command is terminated.

Operator Response: Prepare a job that will cause reconstruction of the VTOC and run it against the volume. (For example, run an IEFBR14 job to allocate a temporary data set to the volume.) On conclusion of this job, resubmit the BUILDIX command.

ICK510I cuu BUILDIX REQUEST CANCELLED DUE TO OPERATOR ACTION

Explanation: The operator replied 'CANCEL' to a message requiring a response.

System Action: Execution of the command is terminated.

Operator Response: None.

ICK511I **cuu CVAF ERROR: RETURN CODE=** ERROR CONDITION= *****

Explanation: The common VTOC access facility returned to Device Support Facilities with a return code indicating either a logical error or a physical error. Return codes have the following meanings:

4, 12
Indicate logical errors

8
Indicates an invalid index structure

16
Indicates an I/O error

The error condition will be printed only for a return code of 4 or 8. See Appendix B of Data Facility Device Support: User's Guide and Reference for more information on these error conditions.

System Action: Execution of the command terminates with the following conditions existing, depending on the return code:

4, 8, 12
The volume is left in OSVTOC format.

16
The volume is left as it was before the command was issued.

Operator Response: None.

ICK512I **cuu ERROR: SYS1.VTOCIX. IS A VIO DATASET. BUILDIX TERMINATED.**

Explanation: The index data set was allocated as a VIO data set and is not supported by the BUILDIX command.

System Action: Execution of the command terminates with a return code of 12. The VTOC is left unchanged.

Operator Response: None.

ICK513I **cuu BUILDIX PROCESSING COMPLETED: VTOC IS NOW IN **FORMAT.**

Explanation: The BUILDIX command completed successfully. '**' shows the new VTOC format, either OS or IX.

System Action: Device Support Facilities is terminated normally.

Operator Response: None.

ICK514I **INDEXED VTOC FACILITY NOT ON SYSTEM. BUILDIX TERMINATED.**

Explanation: A request was made to change a VTOC to IXVTOC format, but the system does not contain indexed VTOC programming support.

System Action: Execution of the command is terminated.

Operator Response: None.

ICK515I **cuu BUILDIX COMMAND FAILED. RETURN CODE= 8**

Explanation: An error occurred that caused execution of the command to be terminated.

System Action: Execution of the command is terminated.

Operator Response: None.

ICK516I **cuu I/O ERROR DETECTED DURING VTOC CONVERSION: ERROR CODE= ***

Explanation: An I/O error occurred during BUILDIX processing. Error codes:

1 - Error occurred in reading the volume label
2 - Error occurred in reading the VTOC
3 - Error occurred in writing the VTOC
4 - Error occurred in writing index records
5 - Index extent was violated; increase index size

System Action: Execution of the BUILDIX command is terminated.

Operator Response: Refer the error indication to the system coordinator for problem determination.

ICK517I **cuu ERROR: VOLUME IS A DOS STACKED PACK**

Explanation: The volume being processed has a VTOC on the first track of the volume. VTOC conversion is not possible on such a volume.

System Action: Execution of the command is terminated.

Operator Response: None.

ICK518I cuu ERROR: VOLUME CONTAINS SPLIT CYLINDER EXTENTS

Explanation: It was found that the volume contains one or more shared extent data sets. These are not supported by the BUILDIX command.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

ICK519I cuu ERROR: SYS1.VTOCIX. DATASET NOT FOUND ON VOLUME

Explanation: The index data set could not be found on the volume.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

ICK520I cuu ERROR: DUPLICATE INDEX DATASET NAME FOUND ON VOLUME

Explanation: Two data sets were found on the volume that had names beginning with SYS1.VTOCIX. Only one per volume is allowed.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

ICK521I cuu ERROR: INDEX DATASET EXTENT NOT CONTIGUOUS

Explanation: The index data set was found to occupy more than one extent. This data set must occupy one, and only one, extent.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

ICK522I INVALID DDNAME SPECIFIED

Explanation: The DDname is incorrect in the command statement.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: Correct the job control statement and resubmit the job.

ICK524I UNABLE TO OPEN VOLUME

Explanation: The volume specified cannot be opened. The DD statement could be missing or invalid.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: Correct the error, and resubmit the job.

ICK600I MAPALT STARTED

Explanation: Execution has started for the MAPALT command.

System Action: None.

Operator Response: None.

ICK602I INCORRECT DEVICETYPE, MAPALT TERMINATED

Explanation: The device type specified is not supported by the MAPALT command.

System Action: Execution of the MAPALT command is terminated.

Operator Response: MAPALT can only be executed on fixed block devices in fixed block mode.

Programmer Response: None.

ICK603I UNABLE TO OPEN VOLUME

Explanation: The volume that was specified cannot be opened. The ASSGN statement could be missing or invalid, or the channel and unit address could be invalid.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Correct the error and resubmit the job.

Programmer Response: None.

ICK604I cuu LIMITS PARAMETER INVALID AS SPECIFIED, MAPALT TERMINATED

Explanation: The relative block numbers(s) specified by the LIMITS parameter are invalid.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Correct the value(s) in the LIMITS parameter, and resubmit the job.

Programmer Response: None.

ICK605I cuu UNRECOVERABLE I/O ERROR DETECTED, MAPALT TERMINATED

Explanation: An unrecoverable I/O error (other than a data check) was encountered.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Check the job output, which will contain diagnostic information to aid in analyzing the error. Execute the Device Support Facilities ANALYZE command as a problem determination aid, and follow installation procedures for recovery from this type of error.

Programmer Response: None

ICK606I nnnnn BLOCKS ASSIGNED TO ALTERNATES IN LIMITS SPECIFIED

Explanation: This summary message shows the number of blocks that were assigned to alternates within the limits specified on the command statement.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK607I cuu MAPALT ABNORMALLY ENDED, REPORT MAY BE INCOMPLETE

Explanation: This message is printed after an error has been encountered that caused execution of the command to be terminated. The report may be incomplete.

System Action: None.

Operator Response: Check previous messages on job output, and follow installation procedures.

Programmer Response: None.

ICK608I cuu MAPALT ENDED NORMALLY, RETURN CODE= n

Explanation: Execution of the command ended without any errors detected that would have caused termination of execution. A return code of 0 or 4 will be indicated in the message. A return code of 0 means no errors were encountered. A return code of 4 means one or more recoverable errors were encountered.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK609I PERMANENT DATA CHECK FOUND READING ID FOR BLOCK nnnnnn

Explanation: A permanent data check was encountered while attempting to read the ID field of the primary block shown in the message.

System Action: Diagnostic information is printed on the output device, and execution of the command continues.

Operator Response: None.

Programmer Response: Save the job output for the system coordinator, and follow installation procedures for data recovery and/or assignment of an alternate block.

ICK610I TEMPORARY DATA CHECK FOUND READING ID FOR BLOCK nnnnnn

Explanation: A temporary data check while attempting to read the ID field of the primary block shown in the message.

System Action: Diagnostic information is printed on the output device and execution of the command continues.

Operator Response: None.

Programmer Response: Save the job output for the system coordinator and follow installation procedures for logging and tracking temporary error conditions.

ICK611I MAIN STORAGE NOT AVAILABLE, MAPALT TERMINATED

Explanation: Dynamic acquisition of storage for control blocks and work areas failed.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Increase main storage size, and resubmit the job.

Programmer Response: None.

ICK705I VOLUME SERIAL NUMBER FOR DEVICE cuu IS xxxxxx

Explanation: Informational message concerning the volume serial and/or VTOC of the volume at cuu. If the volume serial was changed, you also receive one or both of the following:

CHANGED FROM xxxxxx - The volume serial number of the cuu was changed.

The following message could also be received:

VOLUME SERIAL DUPLICATE FOR DEVICE cuu. VOLUME MADE UNAVAILABLE - The new volume serial on the cuu is a duplicate of one already known to the operating system. The device has been unloaded.

If the VTOC location was changed, you also receive the following:

VTOC LOCATION MOVED - The VTOC location of the volume at cuu has moved.

System Action: Device Support Facilities continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

MESSAGES RECEIVED AT THE OUTPUT PRINTER

ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS nn

Explanation: A command has been executed; the value nn is the last condition code (LASTCC) generated during execution of the command.

Note: The LASTCC value is the highest condition code found in the messages printed during execution of the command.

System Action: LASTCC is set to nn; MAXCC is set to nn if nn is greater than the current value of MAXCC.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK00002I ICKDSF PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS nn

Explanation: This message is issued upon completion of a Device Support Facilities job step. The highest condition code (MAXCC) set during the job step is printed (see message ICK00001I) and returned to the Device Support Facilities invoker in register 15.

System Action: None.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK00204I PRECEDING COMMAND BYPASSED DUE TO CONDITION CODES

Explanation: The IF-THEN-ELSE command sequence that was specified caused the command to be bypassed. When specifying an IF-THEN-ELSE command sequence, either the THEN or the ELSE clause is executed, and the one not executed is bypassed.

System Action: The bypassed portion of the command sequence is checked for syntax errors but is not executed. Device Support Facilities processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK00206I IMPROPERLY PLACED COMMA HAS BEEN FOUND AND IGNORED

Explanation: A redundant comma was encountered when scanning the command. It is ignored. The omission of positional parameters cannot be indicated by commas; the omission of leading positional parameters is not permitted.

System Action: The command is executed.

Operator Response: None.

Programmer Response: Correct the syntax error to prevent the message from occurring.

Problem Determination: Table I, items 2, 4, and 29.

ICK00222I WARNING: COMMAND-END DELIMITER APPEARS WITHIN APOSTROPHES

Explanation: The optional command delimiter, a semicolon, was found within a quoted string. A closing single quotation mark may have been omitted.

System Action: The usage is accepted, and the semicolon is treated as a valid character instead of a delimiter.

Operator Response: None.

Programmer Response: Check the usage of the semicolon, and correct if necessary.

Problem Determination: Table I, items 2, 4, and 29.

ICK00233I TOO MANY RIGHT PARENTHESES FOUND. EXCESS IGNORED

Explanation: Too many closing parentheses were found at the end of the command or following a first-level parameter.

System Action: The excess is ignored, and the command continues processing.

Operator Response: None.

Programmer Response: Remove the excess parentheses.

Problem Determination: Table I, items 2, 4, and 29.

ICK00234I WARNING: TOO FEW RIGHT PARENTHESES FOUND AT END OF COMMAND

Explanation: Too few closing parentheses were found at the end of the command to properly close the subparameter lists.

System Action: The omission is accepted. Device Support Facilities processing of the command continues.

Operator Response: None.

Programmer Response: Correct the command syntax.

Problem Determination: Table I, items 2, 4, and 29.

ICK00700I cuu BEING PROCESSED AS LOGICAL DEVICE = xxxx PHYSICAL DEVICE = yyyy

Explanation: The device at address cuu is being processed as a logical device type of xxxx and a physical device type of yyyy.

System Action: Device Support Facilities processing of the command continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01016I ALTERNATE TRACK CCHH=X'cccc hhhh' ASSIGNED TO PRIMARY TRACK CCHH=X'cccc hhhh'

Explanation: An alternate track was assigned to a primary track because the primary track was marked defective, or was found to be defective by surface checking, or an unconditional alternate track assignment was requested for the primary track.

System Action: The command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01018I ALTERNATE CCHH=X'cccc hhhh' RE-ASSIGNED FOR PRIMARY CCHH=X'cccc hhhh'

Explanation: The alternate track originally assigned to the indicated primary track was either marked defective or was found defective through surface checking. Another alternate track was assigned in place of the original alternate track. If the PRESERVE option was specified, the data found on the original alternate track was copied to the new alternate track.

System Action: The command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01020I ALTERNATE TRACK CCHH=X'cccc hhhh' WAS RECLAIMED

Explanation: An alternate track that was previously marked defective appeared to be nondefective when surface checking was performed. The track is added to the set of available alternate tracks.

System Action: The command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01021I PRIMARY TRACK CCHH=X'cccc hhhh' WAS RECLAIMED

Explanation: A primary track that was previously marked defective appeared to be nondefective when surface checking was performed. The primary track is marked available, and the assigned alternate track is added back into the set of available alternate tracks. If the PRESERVE parameter was specified, any data written on the alternate track is copied back onto the reclaimed primary track.

System Action: The command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01302I NO VTOC FOUND ON VOLUME, INITIALIZATION CONTINUES

Explanation: During initialization, Device Support Facilities did not find a volume table of contents. Therefore, the program cannot identify data sets that should not be purged.

System Action: The initialization continues and creates a volume table of contents on the volume.

Operator Response: None.

Programmer Response: If the initialization was performed at the minimal level, the data on the tracks is usually not destroyed, and it is possible to retrieve the data if necessary.

Problem Determination: Not applicable.

ICK01307I DEFECTIVE TRACK LIST FOR VOLUME volid

Explanation: This message is the first line of the volume map. Following this line is a list of any tracks that were found defective during execution of the command.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01308I THE FOLLOWING PRIMARY TRACKS WERE FOUND DEFECTIVE:

Explanation: This message is a line in the volume map that identifies any primary tracks that were found defective during execution of the command.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01309I THE FOLLOWING ALTERNATE TRACKS WERE FOUND DEFECTIVE:

Explanation: This message is a line in the volume map that identifies any alternate tracks that were found defective during execution of the command.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01310I NO DEFECTIVE TRACKS WERE FOUND

Explanation: This message is a line in the volume map that indicates that no defective tracks were found during execution of the command. If the command did not specify that all the tracks were to be checked, tracks that were not checked could be defective.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01311I NO DEFECTIVE PRIMARY TRACKS WERE FOUND

Explanation: This message is a line in the volume map that indicates that no defective primary tracks were found during execution of the command. This does not mean that no defective primary tracks exist if the command did not specify that all the primary tracks are to be checked.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01312I NO DEFECTIVE ALTERNATE TRACKS WERE FOUND

Explanation: This message is a line in the volume map that indicates that no defective alternate tracks were found during execution of the command. This message does not mean that no defective alternate tracks exist on the volume if the command did not specify that all of the alternate tracks are to be checked.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01313I VOLUME CONTAINS nnnn ALTERNATE TRACKS -- mmmm AVAILABLE

Explanation: This message is a line in the volume map. The volume is defined as having nnnn alternate tracks reserved; mmmm tracks have not been assigned to defective primary tracks nor have been found to be defective and unavailable for assignment.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01314I VTOC IS LOCATED AT CCHH=X'cccc hhhh' AND IS xxxx TRACKS

Explanation: This message is a line in the volume map that indicates the cylinder and track where the volume table of contents begins and the number of tracks it occupies.

System Action: The command completed successfully.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK01400I cuu ANALYZE STARTED

Explanation: ANALYZE has started to execute its tests on the logical volume identified in the message (that is, on the volume whose unit address is cuu).

System Action: Processing continues.

Operator Response: None

ICK01405I cuu ALL DATA 'MACHINE READABLE' WITHOUT ERRORS

Explanation: The volume was successfully read during the data verification test (SCAN option).

System Action: ANALYZE processing terminates normally, and message ICK406I (ICK01406I) is issued.

Operator Response: None. (If a data problem prompted you to run ANALYZE, and if the problem persists, further analysis is needed according to your installation's procedures.)

ICK01406I cuu ANALYZE ENDED

Explanation: ANALYZE has completed processing.

System Action: ANALYZE processing terminates.

Operator Response: None.

ICK01407I cuu NO DRIVE PROBLEMS FOUND

Explanation: ANALYZE successfully completed executing the drive tests and did not detect any problems.

System Action: If the SCAN option was specified or defaulted, ANALYZE processing continues with the data verification test. Otherwise, ANALYZE processing terminates, and message ICK406I (ICK01406I) is issued.

Operator Response: None. (If a data problem prompted you to run ANALYZE, and if the problem persists, run the data verification test. If a drive problem prompted you to run ANALYZE, and if the problem persists, further analysis is needed according to your installation's procedures.)

ICK01408I cuu DATA VERIFICATION TEST STARTED

Explanation: ANALYZE has started to execute its data verification tests.

System Action: Processing continues.

Operator Response: None.

ICK01414I WRITE INHIBIT SWITCH ON, WRITE TESTS BYPASSED

Explanation: An error is detected when ANALYZE attempts to write a record and fails because the "R/W" or "READ" switch is in the "READ" position, or the "READ/WRITE" switch position is defective.

System Action: All tests which attempt to write on the CE cylinder are bypassed.

Operator Response: Set the "READ/WRITE" switch in "WRITE" mode.

ICK01415I INVALID UNITADDRESS, SYSNAME OR DDNAME SPECIFIED

Explanation: The channel and unit address specified do not exist in the system I/O configuration, or the DDNAME is incorrect, or the SYSNAME is incorrect.

System Action: ANALYZE command processing is terminated.

Operator Response: Correct the values specified for "cuu" in the UNITADDRESS parameter, or correct the DDNAME specified, or correct the SYSNAME specified, then reissue the command.

ICK01416I UNABLE TO OPEN VOLUME

Explanation: The volume that was specified cannot be OPENed. The DD statement could be missing or invalid, or the channel and unit address could be invalid.

System Action: The ANALYZE command is terminated.

Operator Response: Correct the error, and reissue the command.

ICK01417I WRITE TESTS BYPASSED: BAD HOME ADDRESS DETECTED ON C.E. CYLINDER

Explanation: A bad home address on the CE cylinder was detected while trying to verify positioning of the access mechanism.

System Action: All write-dependent tests are bypassed.

Operator Response: None.

ICK01501I INVALID DEVICE TYPE SPECIFIED FOR BUILDIX COMMAND

Explanation: A request was made to change the format of a VTOC on a volume whose device type is not supported by the BUILDIX command (for example, a 2314 DASD).

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Verify that the volume is on a device type supported by the BUILDIX command, and change the JCL or command statement.

ICK01502I BUILDIX FUNCTION STARTED

Explanation: Execution of the BUILDIX command has begun.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK01503I cuu REQUEST RECEIVED TO CONVERT VTOC TO **FORMAT

Explanation: This message verifies the request for a change of VTOC format. '**' specifies the format requested—either OS or IX.

System Action: Execution of the command continues.

Operator Response: None.

Programmer Response: None.

ICK01504I cuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST ACCEPTED

Explanation: This message verifies that the BUILDIX function specified on the command statement is valid for the current format of the VTOC on the volume. '**' identifies the format of the VTOC, either OS or IX.

System Action: Execution of the command continues.

Operator Response: None.

Programmer Response: None.

ICK01508A cuu SHOULD VTOC CONVERSION PROCEED? REPLY "U" TO CONTINUE, ELSE "C"

Explanation: This message permits the operator to verify that the user is authorized to request the BUILDIX function before execution of the command begins.

System Action: The system will wait for the operator's reply.

Operator Response: Verify that the user is authorized to issue the command, and reply 'U' to continue. Any reply other than 'U' is interpreted as a cancellation request.

Programmer Response: None.

ICK01513I cuu BUILDIX PROCESSING COMPLETED: VTOC IS NOW IN **FORMAT.

Explanation: The BUILDIX command completed successfully. '**' shows the new VTOC format, either OS or IX.

System Action: Device Support Facilities is terminated normally.

Operator Response: None.

Programmer Response: None.

ICK01600I MAPALT STARTED

Explanation: Execution has started for the MAPALT command.

System Action: None.

Operator Response: None.

ICK01606I nnnnn BLOCKS ASSIGNED TO ALTERNATES IN LIMITS SPECIFIED

Explanation: This summary message shows the number of blocks that were assigned to alternates within the limits specified on the command statement.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK01608I cuu MAPALT ENDED NORMALLY, RETURN CODE= n

Explanation: Execution of the command ended without any errors detected that would have caused termination of execution. A return code of 0 or 4 will be indicated in the message. A return code of 0 means no errors were encountered. A return code of 4 means one or more recoverable errors were encountered.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK01609I PERMANENT DATA CHECK FOUND READING ID FOR BLOCK nnnnnn

Explanation: A permanent data check was encountered while attempting to read the ID field of the primary block shown in the message.

System Action: Diagnostic information is printed on the output device, and execution of the command continues.

Operator Response: None.

Programmer Response: Save the job output for the system coordinator, and follow installation procedures for data recovery and/or assignment of an alternate block.

Problem Determination: Table I, items 1, 2, 3, 4, 29.

| **ICK01701I ONLY 5 USER LABELS ALLOWED**

| **Explanation:** Only five user volume labels are allowed for fixed block architecture devices. In the LABEL parameter, you have asked for space for more than five labels.

System Action: Space is reserved for six labels, and processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01704I ALTERNATE ASSIGNED FOR BLOCK xxxxxx

Explanation: Block xxxxxx was found defective during surface analysis. The block has been assigned an alternate.

System Action: Processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01708I RECLAIM SUCCESSFUL FOR BLOCK xxxxxx

Explanation: BLOCK xxxxxx has been successfully reclaimed.

System Action: Processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01714I RECLAIM UNSUCCESSFUL FOR BLOCK xxxxxx

Explanation: The defective block xxxxxx failed surface analysis and could not be reclaimed.

System Action: An alternate is assigned to the block. Processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01715I TOTAL NUMBER OF ALTERNATES ASSIGNED = number

Explanation: Gives the total number of alternate blocks assigned in this run.

System Action: Processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01725I EXCESSIVE NUMBER OF ALTERNATES ASSIGNED FOR A CYLINDER

Explanation: During initialization of a 3370 volume, more than 24 alternates were assigned on one cylinder. This is more than the number of alternates on a cylinder.

System Action: Processing continues.

Operator Response: None.

Programmer Response: This could cause performance degradation on the volume. Hardware support may be called for.

Problem Determination: Table I, items 1, 2, 3 and 4.

ICK01726I nnnnnn FACTORY FLAGGED BLOCKS.

Explanation: Final message of INIT reclaim processing. nnnnnn is the number of factory-flagged blocks assigned an alternate.

System Action: INIT processing surface analysis phase is started

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01727I RECLAIM SPECIFIED WITH NOCHECK. NO RECLAIM DONE

Explanation: RECLAIM function was not performed, because NOCHECK was specified or defaulted. CHECK is required for RECLAIM.

System Action: Processing continues without RECLAIM.

Operator Response: None.

Programmer Response: Specify CHECK and rerun your job if RECLAIM is wanted.

Problem Determination: None.

ICK01729I SPECIFIED CISIZE ADJUSTED TO NEXT HIGHER MULTIPLE OF DEVICE BLOCKSIZE

Explanation: When you specify a CISIZE which is not a multiple of 512, ICKDSF rounds the value up to the next higher multiple.

System Action: Processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01730I RECLAIM AND/OR CHECK NOT SUPPORTED FOR FBA MINI-DISKS

Explanation: The CHECK and/or RECLAIM function requested is not supported for fixed block architecture (FBA) minidisks.

System Action: Processing continues without CHECK or RECLAIM.

Operator Response: None.

Programmer Response: None. If CHECK or RECLAIM is needed, the full volume must be initialized.

Problem Determination: None.

ICK01731I MAP FUNCTION NOT SUPPORTED FOR MINI-DISKS

Explanation: The MAP parameter was specified on the command, but MAP is not supported for fixed block architecture (FBA) minidisks.

System Action: Processing continues without MAP function.

Operator Response: None.

Programmer Response: None

Problem Determination: None.

ICK01754I xx OF THE INSPECTED BLOCKS HAVE ALTERNATES ASSIGNED

Explanation: This is the summary message printed when MAP is specified. xx is the number of blocks inspected that have alternates assigned.

System Action: None.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01759I USER DATA ON BLOCK xxxxxx RESTORED

Explanation: Processing of the command failed with a permanent error, and ICKDSF was able to restore the data on block xxxxxx before terminating the command.

System Action: The command is terminated because of a previously reported error. Processing continues with the next command.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01760I SURFACE OF BLOCK xxxxxx DEFECTIVE

Explanation: The check function found the surface of block xxxxxx defective.

System Action: If ASSIGN is specified, an alternate is assigned.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01761I SURFACE OF BLOCK xxxxxx NOT DEFECTIVE

Explanation: The check function found the surface of block xxxxxx not defective.

System Action: Processing continues with the next block.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK01765I NEW ALTERNATE ASSIGNED TO BLOCK xxxxxx

Explanation: Block xxxxxx has been assigned a new alternate.

System Action: Processing continues.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK10705I VOLUME SERIAL NUMBER FOR DEVICE cuu IS xxxxxx

Explanation: Informational message concerning the volume serial and/or VTOC of the volume at _cuu_. If the volume serial was changed, you also receive one or both of the following:

CHANGED FROM xxxxxx - The volume serial number of the _cuu_ was changed.

The following message could also be received:

VOLUME SERIAL DUPLICATE FOR DEVICE cuu. VOLUME MADE UNAVAILABLE - The new volume serial on the cuu is a duplicate of one already known to the operating system. The device has been unloaded.

If the VTOC location was changed, you also receive the following:

VTOC LOCATION MOVED - The VTOC location of the volume at cuu has moved.

System Action: Device Support Facilities continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK10710I I/O ERROR OCURRED ON DEVICE cuu

Explanation: An I/O error occurred on the device whose address is specified by cuu. The nature of the I/O error is described on the next two lines, where the failing channel command word (CCW), the channel status word (CSW), and the sense bytes are printed.

System Action: The command continues processing. Eventual termination of the command may occur, but such a termination is generally followed with a terminating message.

Operator Response: None.

Programmer Response: Make sure that the problem is, indeed, with the device. Correct the device problem, and retry the command.

ICK11005I VTOC DOES NOT EXIST

Explanation: A volume table of contents was not found on the volume during execution of the command.

System Action: A volume table of contents was created, and the command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Not applicable.

ICK11009I IPL PROGRAM SUPPLIED FOR MSS -- IGNORED

Explanation: A volume being formatted as an MSS staging pack cannot contain IPL records.

System Action: The IPL program specified is ignored, and the command continues processing.

Operator Response: None.

Programmer Response: Remove the IPLDD parameter from the command.

Problem Determination: Not applicable.

ICK11010I UNABLE TO CLOSE VOLUME

Explanation: A system error occurred that prevents the volume from being closed properly.

System Action: The command probably did not complete successfully because the volume did not close when the command completed. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK11019I NEXT-AVAILABLE-ALTERNATE POINTER OR COUNTER IN VTOC IS INVALID

Explanation: The value of the pointer to the next available alternate track or the count of the number of alternate tracks that are available is in error.

System Action: Processing continues. If it is possible, the value in the VTOC is updated when processing completes.

Operator Response: None.

Programmer Response: Reinitialize the volume at either the minimal or the maximal level.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK11050I VTOC LOCATION SPECIFIED FOR MSS STAGING PACK -- IGNORED

Explanation: You cannot specify a VTOC location for a Mass Storage System staging pack.

System Action: The VTOC parameter is ignored, and the command continues processing.

Operator Response: None.

Programmer Response: Remove the VTOC parameter from the command.

Problem Determination: Not applicable.

ICK11051I LABELS PARAMETER SPECIFIED FOR MSS STAGING PACK -- IGNORED

Explanation: You cannot place user volume labels on a Mass Storage System staging pack.

System Action: The LABELS parameter is ignored, and the command continues processing.

Operator Response: None.

Programmer Response: Remove the LABELS parameter from the command.

Problem Determination: Not applicable.

ICK11306I NO STORAGE AVAILABLE FOR PACK MAP

Explanation: During initialization or inspection of a volume, storage is dynamically acquired for data elements that are collected later to format the pack map. A data element was being allocated, but storage was not available.

System Action: The command is completed, but without a pack map.

Operator Response: None.

Programmer Response: Specify a larger region size, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK11315I UNABLE TO READ VOLUME LABEL

Explanation: An I/O error occurred when attempting to read the volume label. Because the number of user volume labels cannot be determined, the IPL program record could be written over existing records.

System Action: The command continues processing, but does not write the IPL program records.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK11328I SKIP DISPLACEMENTS ASSIGNED TO TRACK X'00cc00hh'

Explanation: Defective areas on the track have been bypassed. ICKDSF processing continues on nondefective areas of the track.

System Action: The command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK11330I UNIT PARAMETER INVALID

Explanation: The UNIT parameter is invalid in the current environment.

System Action: The command terminates.

Operator Response: None.

Programmer Response: Correct the control statement, and resubmit the job.

| **ICK11333I RECURRING CORRECTABLE DATA CHECK ON TRACK CCHH=X'cccc hhhh'**

| **Explanation:** Surface analysis for the specified track detected at least two occurrences of a correctable data check. These correctable data checks can be processed by the Error Recovery Programs (ERPs).

| **System Action:** None. Processing continues with the next track.

| **Operator Response:** None.

| **Programmer Response:** If you want to assign an alternate track to the track in question, specify INSPECT ASSIGN NOCHECK.

| **Problem Determination:** None.

| **ICK11334I DSF CURRENTLY PROCESSING TRACK CCHH=X'cccc hhhh'**

| **Explanation:** Information message given when Device Support Facilities is performing full volume processing. The message is issued to indicate Device Support Facilities progress.

System Action: None. Processing continues with the next track.

Operator Response: None.

Programmer Response: None.

Problem Determination: None.

ICK11752I BLOCK xxxxxx OUTSIDE DEVICE LIMITS

Explanation: BLOCK number xxxxxx specified by the BLOCKS parameters is invalid.

System Action: The command continues. The invalid block number is ignored.

Operator Response: None.

Programmer Response: Resubmit the job, specifying the correct block number in the BLOCKS parameter.

Problem Determination: Table I, items 1, 3, and 4.

ICK20011I FUNCTION CANNOT BE EXECUTED. INSUFFICIENT MAIN STORAGE

Explanation: There is not enough virtual storage available to execute a command.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Increase the amount of virtual storage available to Device Support Facilities, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, and 29.

ICK20800I UNABLE TO SCRATCH dsname

Explanation: An error occurred while attempting to scratch the identified data set. A subsequent second-level message identifies the error.

System Action: The data set is not scratched. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: See the associated message.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK20801I ** NO VOLUME MOUNTED

Explanation: Volume not mounted.

System Action: The data set is not scratched. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command and make sure the correct volume is mounted.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK20802I ** PASSWORD VERIFICATION FAILED

Explanation: The data set to be scratched is password protected, and the operator did not supply the proper password.

System Action: The data set is not scratched. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command, and specify the correct password when prompted.

Problem Determination: Table I, items 1, 2, 3, 4, 25a, and 29.

ICK20803I ** DATA SET HAS NOT EXPIRED ON VOLUME volser

Explanation: The PURGE parameter was not specified, and the data set's retention period has not expired.

System Action: The data set is not scratched. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Specify the PURGE parameter if you want to destroy the data set, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, 25a, and 29.

ICK20804I ** PERMANENT I/O ERROR ON VOLUME

Explanation: Because of an I/O error condition, the volume table of contents cannot be read.

System Action: The data set is not scratched. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Either restore the volume or initialize the volume offline.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK20805I ** UNABLE TO MOUNT VOLUME volser

Explanation: An appropriate device was not available for mounting the volume.

System Action: The data set was not scratched. Device Support Facilities processing continues with the next command.

Operator Response: Ensure that a device is available for mounting, and reissue the command.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK20806I ** DATA SET WAS IN USE

Explanation: The data set to be scratched was being used by another program.

System Action: The data set is not scratched, and the command continues processing.

Operator Response: Ensure that no other job is using the data set (do not specify DISP=SHR), and reissue the command.

Programmer Response: None.

Problem Determination: Table I, items 1, 2 3, 4, 25a, 25c, and 29.

ICK20810I ** INVALID RACF AUTHORIZATION

Explanation: A RACF-protected data set resides on the volume. The volume cannot be purged, because the user does not have the correct authorization to scratch the data set.

System Action: The data set is not scratched, and the command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK20950I INVALID FORMAT STRUCTURE

Explanation: An element of one of the static text structures is incorrect. Probable program error.

System Action: The request to print a line is ignored. The command continues processing, but no output is printed.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK20951I OUTPUT COLUMN SPECIFIED OUT OF RANGE

Explanation: An output column specification is outside the allowed print line width, for example, beyond column 120. Probable program error.

System Action: This field and subsequent fields for the same line are ignored. The command continues processing, but no output is printed.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK20952I EXCESSIVE FIELD LENGTH FOR BD OR PU CONV

Explanation: A binary-to-decimal or packed-to-unpacked conversion length was specified greater than 15. Probable program error.

System Action: The default of 15 was used, and the command continues processing.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK20953I A REDO SUB-STRUCTURE IS NESTED

Explanation: A redo structure cannot be defined within a set of structures to be redone. Probable program error.

System Action: The current redo operation is terminated. All structures are treated only once.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 3, 4, and 29.

ICK20954I STATIC TEXT ENTRY REQUESTED NOT IN MODULE

Explanation: A request for a specific static text entry in a specified static text module could not be resolved. The static text index is incorrect, or the programmer has neglected to enter a message into the static text module. Probable program error.

System Action: The request is ignored, and the command continues processing.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 2, 3, 4, 26c, and 29.

ICK20955I INVALID PACKED DECIMAL FIELD

Explanation: A conversion request for packed-to-unpacked decimal encountered a digit that was not in the range of 0 to 9. Probable program error.

System Action: Conversion stops for the current request. The command continues processing without the packed-to-unpacked conversion.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21000I ALTERNATE TRACK CCHH=X'cccc hhhh' FOUND UNRECOVERABLE

Explanation: While checking the track surface, error conditions were encountered that prevented the alternate track's home address or record 0 from being rewritten to indicate that it is a defective track. Since the track cannot be marked defective, it cannot be used by the operating system. This message may appear if, during execution of a command, the read/write mode switch is inadvertently set to READ mode.

For 2305 Fixed Head Storage Models 1 and 2, this message indicates that the alternate track is already assigned and that the customer engineer should reset the device to replace the defective primary track with an alternate spare. To make the dynamic spare available again, the 2305 device must be initial-microprogram-loaded and reinitialized.

System Action: Device Support Facilities processing continues, unless the unrecoverable track threshold has been reached (see message ICK31013I).

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21001I PRIMARY TRACK CCHH=X'cccc hhhh' FOUND UNRECOVERABLE

Explanation: While checking the track surface, error conditions were encountered which prevented the primary track's home address or record 0 from being rewritten, to indicate that it is a defective track. Since the track cannot be marked defective, it cannot be used by the operating system. This message may appear if, during execution of a command, the read/write mode switch is inadvertently set to READ mode.

For 2305 Fixed Head Storage Models 1 and 2, this message indicates that the alternate track is already assigned and that the customer engineer should reset the device to replace the defective primary track with an alternate spare. To make the dynamic spare available again, the 2305 device must be initial-microprogram-loaded and reinitialized.

System Action: Device Support Facilities processing continues, unless the unrecoverable track threshold is met (see message ICK31013I).

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21002I INVALID VTOC ORIGIN SPECIFICATION FOR TRACK CCHH=X'cccc hhhh'

Explanation: The VTOC parameter specifies an invalid track location for the volume table of contents. The VTOC cannot begin on cylinder 0, track 0 or encroach on the alternate track area.

System Action: The command is terminated. ICKDSF continues with the next command.

Operator Response: None.

Programmer Response: Either accept the default location, or reissue the command with a correct location specified.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21003I INVALID VTOC EXTENT SPECIFICATION: xxxx

Explanation: The VTOC parameter specifies an invalid extent (number of tracks) for the VTOC area. The VTOC cannot have an extent of 0 or encroach on the alternate track area.

System Action: The command is terminated. ICKDSF continues with the next command.

Operator Response: None.

Programmer Response: Either accept the default extent, or reissue the command with a correct extent specified.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21007I R-ZERO INCORRECT -- x CCHH=X'cccc hhhh' (X'cccc hhhh') y CCHH=X'cccc hhhh'

Explanation: The track address portion of record 0 of an alternate track (y CCHH=X'cccc hhhh') points to a primary track (x CCHH=X'cccc hhhh'), but the track address portion of record 0 of the primary track does not point to that alternate track. The track address portion of the primary track's record 0 is shown in parentheses.

_x_ and _y_ are replaced by the character D or N indicating defective or nondefective, respectively.

When scanning the primary tracks, if the track address portion of record 0 of a primary track is incorrect, the Device Support Facilities program places FFFF:FFFF in the alternate track address field of the message. There may or may not be an alternate track that points to this primary track.

System Action: If the alternate track is not marked defective, it is made available for assignment. Otherwise, the alternate track remains marked defective, and the primary track remains as found.

Operator Response: None.

Programmer Response: Initialize the volume at the medial or maximal level to correct the track descriptor of the primary track. Alternatively, inspect the volume and unconditionally assign an alternate track to the indicated primary track.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21008I UNABLE TO WRITE IPL RECORDS

Explanation: The IPL program records could not be written. Messages printed just prior to this message indicate the nature of the error.

System Action: The IPL program records are not written, but the command continues processing.

Operator Response: None.

Programmer Response: Correct the error, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21011I CRITICAL TRACK CCHH=X'cccc hhhh' DESCRIPTOR INCORRECT

Explanation: The critical tracks are those tracks that are reserved for the volume table of contents and cylinder 0, track 0. The contents of the record 0 on the identified track are in error.

System Action: None.

Operator Response: None.

Programmer Response: Reinitialize the volume at the medial or maximal level.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21014I SURFACE CHECK FUNCTION FAILS ON TRACK CCHH=X'cccc hhhh'

Explanation: While writing or reading the indicated track, a channel program failure other than DATA CHECK occurred.

System Action: The command terminates. Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21017I NO MORE ALTERNATE TRACKS LEFT ON PACK

Explanation: All nondefective alternate tracks have been assigned to primary tracks.

System Action: Assignment of alternate tracks ends; execution of the command continues.

Operator Response: None.

Programmer Response: Reinitialize the volume at the maximal level to attempt to reclaim primary and alternate tracks.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21028I NOT ALLOWED TO CHANGE VOLUME LABEL

Explanation: Only an authorized user can change the volume label on a volume in a system that has Resource Access Control Facility (RACF) installed.

System Action: The contents of the volume label are not changed, but the command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21030I NOT ALLOWED TO WRITE IPL RECORDS

Explanation: Only an authorized user can change the IPL records on a volume in a system that has Resource Access Control Facility (RACF) installed.

System Action: The IPL records are not written, but the command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21031I UNABLE TO RECLAIM ALTERNATE TRACK CCHH=X'cccc hhhh'

Explanation: An I/O error occurred when attempting to rewrite the home address and record 0 on the indicated alternate track.

System Action: The alternate track is not reclaimed. The command continues processing.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21032I UNABLE TO RECLAIM PRIMARY TRACK CCHH=X'cccc hhhh'

Explanation: An I/O error occurred when attempting to rewrite the home address and record 0 on the indicated primary track.

System Action: The primary track is not reclaimed. The command continues processing.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21033I TRACK DISSOCIATION FAILED: CCHH=X'cccc hhhh'

Explanation: When reclaiming a primary or alternate track, the track addresses associating the primary and alternate tracks could not be removed because an error occurred that prevented correct rewriting of the record 0.

System Action: The alternate track is marked defective, and the command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21037I INVALID TRACK ADDRESS SPECIFIED: CCHH=X'cccc hhhh'

Explanation: Only tracks within the defined primary or alternate track areas of a volume can be inspected. The error is caused either by specifying a track beyond these areas or by a syntax error when specifying the track address.

System Action: The requested action on the invalid track is ignored, but the remainder of the command continues processing for any tracks that were correctly specified.

Operator Response: None.

Programmer Response: Correct the invalid specification, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21039I PRIMARY TRACK CCHH=X'cccc hhhh' DEFECTIVE, NO ALTERNATE -- DATA SAVED

Explanation: Surface checking found the indicated primary track to be defective, but no alternate track is available to be assigned to it.

System Action: The contents of the primary track are saved and rewritten on the primary track, if possible. The command continues processing.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21040I PRIMARY TRACK CCHH=X'cccc hhhh' DEFECTIVE, NO ALTERNATE -- DATA LOST

Explanation: Surface checking found the indicated track to be defective, but no alternate track is available to be assigned to it.

System Action: The contents of the primary track are lost and not rewritten on the primary track. The command continues processing.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21041I ALTERNATE TRACK CCHH=X'cccc hhhh' DEFECTIVE -- DATA SAVED

Explanation: Surface checking found the indicated alternate track to be defective, but no alternate track is available to be reassigned to it.

System Action: The contents of the alternate track are saved and rewritten to the alternate track, if possible. The command continues processing.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21042I ALTERNATE TRACK CCHH=X'cccc hhhh' DEFECTIVE -- DATA LOST

Explanation: Surface checking found the indicated alternate track to be defective, but no alternate track is available to be reassigned to it.

System Action: The contents of the alternate track are lost and not rewritten on the alternate track. The command continues processing.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21044I UNABLE TO PRESERVE -- UNABLE TO READ TRACK CCHH=X'cccc hhhh'

Explanation: A record on the indicated cylinder and track could not be read because of I/O errors.

System Action: The record on the indicated track is not lost. The command continues processing.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21047I UNABLE TO PRESERVE -- UNABLE TO WRITE TRACK CCHH=X'cccc hhhh'

Explanation: An I/O error occurred that prevented successful write operations while attempting to write preserved records back to the original track or its assigned alternate track.

System Action: The data on the track may have been lost, and the command continues processing.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21048I CYL-0 TRK-0 DEFECTIVE, PACK UNUSABLE FOR IPL

Explanation: Cylinder 0, track 0 has been found defective. The track has been assigned an alternate track, but the volume cannot be used as an IPL volume.

System Action: The command continues processing.

Operator Response: None.

Programmer Response: Call the customer engineer if you must use this volume as an initial-program-load volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21055I VTOC IS LOCATED ON CYLINDER 0 HEAD 0

Explanation: The volume table of contents exists on the first track of the volume. This prevents the writing of IPL program records on the first track of the volume.

System Action: The IPL program records are not written on the first track of the volume as requested by the user. Command processing continues.

Operator Response: None

Programmer Response: If it is necessary to have IPL records on the volume, reinitialize the volume with the VTOC on any other track other than the first track of the volume.

ICK21316I UNABLE TO OPEN IPL INPUT DATA SET

Explanation: The data set specified by the IPLDD parameter cannot be opened. An associated message identifies the reason for the failure.

System Action: The command continues processing, but the IPL program record is not written.

Operator Response: None.

Programmer Response: Correct the error that was identified in the associated message, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21317I IPL INPUT RECORD-1 FORMAT IMPROPER

Explanation: The first user-specified IPL bootstrap record did not contain IPL1 as the first four characters of the record.

System Action: The system-defined IPL bootstrap records are written on the volume and processing continues. The remainder of the user-specified IPL bootstrap records and IPL program records are ignored.

Operator Response: None.

Programmer Response: Correct the IPL bootstrap record format and reissue the command, or accept the system-defined IPL bootstrap records.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21318I IPL INPUT RECORD-2 FORMAT IMPROPER

Explanation: The second user-specified IPL bootstrap record did not contain IPL2 as the first four characters of the record.

System Action: The system-defined IPL bootstrap records are written on the volume and processing continues. The user-specified IPL bootstrap records and IPL program records are ignored.

Operator Response: None.

Programmer Response: Correct the IPL bootstrap record format and reissue the command, or accept the system-defined IPL bootstrap records.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21319I UNABLE TO WRITE BOOTSTRAP-1 RECORD ON VOLUME

Explanation: An I/O error occurred when attempting to write the first IPL bootstrap record on cylinder 0, track 0. The volume is unusable for IPL.

System Action: The command continues processing, but the IPL bootstrap records are not written on the volume.

Operator Response: None.

Programmer Response: Issue the INSPECT command to attempt to reclaim the track, or reinitialize the volume.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK21320I UNABLE TO WRITE BOOTSTRAP-2 RECORD ON VOLUME

Explanation: An I/O error occurred when attempting to write the second IPL bootstrap record on cylinder 0, track 0. The volume is unusable for IPL.

System Action: The command continues processing, but the IPL bootstrap records are not written on the volume.

Operator Response: None.

Programmer Response: Issue the INSPECT command to attempt to reclaim the track, or reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21321I UNABLE TO WRITE IPL PROGRAM ON VOLUME

Explanation: An I/O error occurred when attempting to write the IPL program record on the volume. The volume is unusable for IPL.

System Action: The command continues processing, but the IPL program record is not written on the volume.

Operator Response: None.

Programmer Response: Issue the INSPECT command to attempt to reclaim the track, or reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21322I CALCULATED IPL PROGRAM LENGTH IS EXCESSIVE

Explanation: The total number of bytes required by the user-specified IPL program exceeds the maximum permitted for the volume being initialized.

System Action: The command continues processing, but the IPL program is not written on the volume.

Operator Response: None.

Programmer Response: Determine the cause of the excessive size, recompile or reassemble the IPL program, then reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21323I IPL PROGRAM INPUT CONTAINS NO TXT CARDS

Explanation: The input records specified for the IPL program source were read, but contained no records that were identified as standard text (TXT) records.

System Action: The IPLDD parameter is ignored, and the command continues processing.

Operator Response: None.

Programmer Response: Be sure the correct input is supplied in the input stream or in the specified data set.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK21755I READ FOR PRESERVE OF BLOCK xxxxxx FAILED: NON-CORRECTABLE DATA CHECKS-PROCESSING OF BLOCK TERMINATED

Explanation: The user data on block xxxxxx could not be read because of permanent data checks.

System Action: Diagnostic information is printed on the ouput device. Processing of the block is terminated to prevent the loss of the user data on the block. Processing continues with the next valid block specified in the BLOCKS parameter.

Operator Response: None.

Programmer Response: Start error recovery procedures for the data set containing the block in error, and rerun the command for the block in error with NOPRESERVE specified.

Problem Determination: Table I, items 1, 2, 3, and 4.

ICK30003I FUNCTION TERMINATED. CONDITION CODE IS nn

Explanation: A command has encountered a terminating error condition during execution (see message ICK00001I for an explanation of nn). Messages printed just prior to this message indicate the nature of the error.

System Action: Device Support Facilities processing continues with the next command. LASTCC is set to nn; MAXCC is set to nn if nn is greater than the current value of MAXCC.

Operator Response: None.

Programmer Response: Correct the cause of the error, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30004I FUNCTION TERMINATED. INSUFFICIENT MAIN STORAGE

Explanation: The allocated virtual storage is too small.

System Action: Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Increase the allocated size of virtual storage, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, and 29.

ICK30008I FUNCTION NOT SUPPORTED IN THIS ENVIRONMENT

Explanation: The system adapter was entered with a request to perform a command not supported in the current operating system environment. Probable program error.

System Action: Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: The version of Device Support Facilities is not appropriate for the operating system environment. Ensure that the appropriate version is installed.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30200I TOO MANY POSITIONAL PARAMETERS AFTER xxxx

Explanation: A parameter list has too many positional parameters specified, specifically those following the characters xxxx.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Remove the excess parameters from the command, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30201I CONSTANT xxxx EXCEEDS LENGTH LIMIT

Explanation: The constant xxxx contains more characters than the maximum permitted by the command syntax.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the constant, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30202I ABOVE TEXT BYPASSED UNTIL NEXT COMMAND. CONDITION CODE IS 12.

Explanation: A syntax error has been encountered: the remainder of the command is ignored. Messages printed just prior to this message indicate the nature of the error.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the syntax error, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30203I ITEM xxxx DOES NOT ADHERE TO RESTRICTIONS

Explanation: An indicated parameter does not conform to the naming conventions required. For example, dname may be misspelled.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the parameter error, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30205I DELIMITER xxxx IS NOT PROPERLY PRECEDED BY A CONSTANT OR KEYWORD

Explanation: A delimiter was found where a subparameter list or data was expected. The delimiter is improperly used: Parentheses may be improperly positioned, or a positional parameter may be missing.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the syntax error, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30207I REMAINDER OF COMMAND INPUT STREAM IGNORED

Explanation: An error has occurred which prohibits further scanning of the command stream. Messages printed just prior to this message indicate the nature of the error.

Note: The condition code (MAXCC) is always set to 16 when this situation is encountered.

System Action: Device Support Facilities terminates.

Operator Response: None.

Programmer Response: Correct the error, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30208I LEFT PARENTHESIS MISSING FOLLOWING KEYWORD xxxx

Explanation: The keyword xxxx is not followed by an opening parenthesis, which should begin the required subparameter list or value associated with the command keyword.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the requirements of the keyword, correct the syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30209I RIGHT PARENTHESIS MISSING AFTER xxxx

Explanation: A closing parenthesis was not found where expected, or a subparameter list was not properly delimited.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30210I INVALID PARENTHESES FOR SPECIFYING REPEATED SUBPARAMETER LIST

Explanation: Parentheses that are used for delimiting repeated subparameter lists are missing or not matched.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30211I KEYWORD xxxx IS IMPROPER

Explanation: A misspelled, improperly specified, or inapplicable keyword was encountered in the command.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30212I INVALID LEFT PARENTHESIS AFTER xxxx

Explanation: An opening parenthesis was found which appeared to delimit the positional parameter xxxx, but the positional parameter was not a constant or a list of constants.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30213I KEYWORD xxxx APPEARS TOO OFTEN

Explanation: The keyword xxxx has appeared too often in the command. A parameter list may be incorrectly specified.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax by removing the keyword, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30214I HEX OR BINARY CONSTANT SPECIFIED IMPROPERLY

Explanation: A hexadecimal or binary constant is not specified in the correct format: X'n' or B'n', respectively.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30216I ABOVE TEXT BYPASSED UNTIL NEXT COMMAND

Explanation: An error was encountered during the syntax check of this command, and syntax checking was terminated. Messages printed just prior to this message indicate the nature of the error.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30217I PASSWORD IMPROPER AFTER xxxx

Explanation: A password, denoted by a slash (/), was encountered where a password is not allowed.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Remove the password from the parameter, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30218I TOO MANY REPEATED SUBPARAMETER LISTS APPEAR

Explanation: Too many repeated subparameter lists appear in the command.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the command syntax, correct the error, then reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30219I VERB NAME xxxx UNKNOWN

Explanation: The verb xxxx is not recognized as a command.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command with the correct command name.

Problem Determination: Table I, items 2, 4, and 29.

ICK30220I IMPROPER NUMERIC DIGIT FOUND IN xxxx

Explanation: An invalid character was encountered in the constant xxxx. A decimal number can only be specified with the symbols 0 through 9; a hexadecimal number can only be specified with the symbols 0 through 9 and A through F; and a binary number can only be specified with the symbols 0 and 1.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax error, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30221I CONSTANT xxxx NOT WITHIN VALUE RANGE

Explanation: The value of the constant xxxx is outside the range of values allowed for the associated parameter.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the command syntax for allowed values, correct the error, then reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30223I TOO MANY CONSTANTS IN LIST BEGINNING AT xxxx

Explanation: Too many constants were specified in the command beginning at the characters xxxx.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30225I REQUIRED (SUB)PARAMETER OF xxxx IS MISSING

Explanation: A required parameter or subparameter, identified by xxxx, is missing.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Add the missing parameter, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30226I INCONSISTENT PARAMETERS INVOLVING xxxx

Explanation: Some commands contain parameters that are defined as mutually exclusive. If one parameter is specified, the other parameter is not allowed.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK30300I ERROR OPENING dsname | ddname

Explanation: An error occurred when attempting to open the indicated data set or volume. See the associated message for the cause of the error.

System Action: See the associated message.

Operator Response: None.

Programmer Response: See the associated message.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30301I ERROR CLOSING dsname

Explanation: An error was encountered while attempting to close the data set. See the associated message for the cause of the error.

System Action: See the associated message.

Operator Response: None.

Programmer Response: See the associated message.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30302I ACTION ERROR ON dsname

Explanation: This message identifies the name of the data set that was processing when the error occurred. See associated message for an explanation of the error.

System Action: None.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30304I **JCL STATEMENT MISSING

Explanation: The DD statement that was identified in the DDNAME parameter is missing (OS/VS1, OS/VS2).

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Be sure the DD statement is in the job stream as specified in the command. Check the DDNAME for correct spelling.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30309I **RECORD xxxxx NOT WRITTEN. LENGTH INVALID

Explanation: The record xxxxx was not written for one of the following reasons:

- The record length was greater than LRECL of the output data set.
- The record length was less than the LRECL of the output data set and RECFM was F (fixed).

Note: xxxxx is the first five bytes of the record in hexadecimal format.

System Action: Device Support Facilities continues processing until four such errors occur. After four errors, the command continues to execute, but no further records are written to the output data set.

Operator Response: None.

Programmer Response: Redefine the data set with the correct LRECL value.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30312I **SYSTEM UNABLE TO OPEN

Explanation: The DCBOFLG was not set ON following an OPEN SVC (OS/VS), or the OPEN system macro failed (DOS/VSE). See the associated messages for the cause of the error.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Perform the Problem Determination actions.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30313I **synad.text

Explanation: An I/O error occurred. The contents of the OS/VS Data Management Services SYNADAF error message are written.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the explanation of the SYNADAF message. Correct the error, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30315I **RECORD SIZE GREATER THAN 32767 NOT SUPPORTED

Explanation: The system cannot process a logical record whose size is greater than 32,767 bytes.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Change the DD statement to specify a LRECL length that is less than 32,767 bytes.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30317I **PERMANENT I/O ERROR

Explanation: An error was detected while performing an I/O operation. The data set name is given in the associated message.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the OS/VS JCL statements to be sure the data set was correctly defined. If the data set was correctly defined, a hardware error was encountered and the data set must be re-created on another I/O device.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK30318I **INVALID DATA SET SPECIFICATION

Explanation: In the DOS/VSE environment, the I/O adapter open/close routine was unable to open a data set because of an invalid specification of the data set in the DLBL statement.

System Action: Processing for the specific data set is terminated. Command processing will continue if the opening of the specific data set is deemed noncritical to the main function performed by the command.

Operator Response: None.

Programmer Response: Probable user error. Check the DLBL statement. If there are no errors, contact your system programmer.

ICK30320I **INVALID DEVICETYPE

Explanation: In the DOS/VSE environment, the I/O adapter open/close routine was unable to open a data set, because it exists on a device that is not supported for sequential processing.

System Action: Processing for the specific data set is terminated, and the command processing will continue if the opening of the specific data set is deemed noncritical to the main function performed by the command.

Operator Response: None.

Programmer Response: Probable user error. The data set does not exist on a valid device that is supported for sequential processing (SAM access method). Correct the situation, and resubmit the job. If the error persists, contact your system programmer.

ICK30321I **OPEN/CLOSE ABEND EXIT TAKEN

Explanation: The OPEN/CLOSE System Services SVC detected an error when opening or closing a data set. The ABEND message was written to the JOBJCL data set.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the ABEND message, correct the error, then reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30500I MAIN STORAGE NOT AVAILABLE, COMMAND TERMINATED

Explanation: Dynamic acquisition of storage for control blocks and work areas failed.

System Action: The command is terminated.

Operator Response: Increase main storage size, and resubmit the job.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30701I EQUIPMENT CHECK ON cuu

Explanation: An EQUIPMENT CHECK I/O error occurred.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK30702I OPERATOR DID NOT READY DEVICE

Explanation: When the operator was prompted by message ICK004D to make a device ready, the response was to terminate the command.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30703I DEVICE ALREADY IN USE

Explanation: The device referenced in the ICKDSF command by the UNITADDRESS or DDNAME parameter is already being used by another job.

System Action: The device referenced in the ICKDSF command by the UNITADDRESS or DDNAME parameter is already being used by another job.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30704I INVALID DEVICE-TYPE FOR FUNCTION

Explanation: The type of device specified is invalid for the command issued. For instance, a Mass Storage System staging pack cannot be a 2314 device.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command, and specify an appropriate device.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30705I OPERATOR DID NOT SET DEVICE TO WRITE-MODE

Explanation: During I/O operations, the device was found set for read-only mode. The operator elected to terminate the command in response to message ICK014D instead of setting the device to write mode.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Ensure that the device is in write mode, and resubmit the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK30706I DEVICETYPE PARAMETER MISSING OR ERRONEOUS

Explanation: This message appears only in a stand-alone environment. The DEVICETYPE parameter must specify one of the valid device types. See Figure 2 on page 4 for valid device types.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the error, and reissue the command.

Problem Determination: Table I, items 2, 3, 4, and 29.

ICK30707I MIMIC MINI/EMU SPECIFICATION ERRONEOUS

Explanation: The number of cylinders specified, either for an OS/VS minidisk for the VM/370 environment or for an emulated Count Key Device on a fixed block device, is g eater than the total number of prima y cylinders that exist on the volume.

System Action: The command terminates and Device Support Facilities continues processing with the next command.

Operator Response: None.

Programmer Response: Correct the invalid number of cylinders in the MINI or EMU specification, and resubmit the job.

ICK30708I DEVICETYPE PARAMETER REQUIRED WITH MIMIC MINI SPECIFICATION.

Explanation: When you specify the MIMIC MINI parameter, you must also specify the DEVICETYPE parameter.

System Action: The command terminates and Device Support Facilities continues processing with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and resubmit the job.

ICK30709I ACCESS DENIED TO SHARED DEVICE cuu BY OPERATOR

Explanation: If the operator replies T to message ICK008D, this message appears before termination of the command.

System Action: Command processing terminates, and Device Support Facilities continues processing with the next command.

Operator Response: None.

Programmer Response: Resubmit the job when the volume is accessible.

ICK30711I CHANNEL ERROR: CSW=XXXXXX XXXXXXXX

Explanation: An unrecoverable channel error occurred. xx . . . xx is a hexadecimal display of the last seven bytes of the CSW at the time of the error.

System Action: Execution of the command is terminated. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table 1, items 1, 2, 3, 4, 29.

ICK30712I xxx DEVICE TYPE VERIFICATION FAILED

Explanation: During OPEN, ICKDSF was unable to determine the device type at address xxx, or the device type is not supported. If the sense ID CCW X'E4' is supported by the device at address xxx, then the following message is issued:

```
PHYSICAL DEVICE=UNKNOWN
SENSE ID=xxxxxxxxxxxxxx
```

See the appropriate device manual for the sense ID information. Basically, the format is as follows:

```
byte 0     = X'FF'
byte 1-3   = control unit id
bytes 4-6  = device id
```

If the sense ID CCW is not supported by the device, the following message is issued:

```
PHYSICAL DEVICE=UNKNOWN
LOGICAL DEVICE=UNKNOWN
```

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: The direct access devices supported by ICKDSF are listed in the Introduction. Check that the device specified by the UNITADDRESS, DDNAME, or SYSNAME parameter is supported by ICKDSF. If the device is supported by ICKDSF, follow the problem determination shown.

Problem Determination: Table I, items 1, 2, 3, 4, 13, 29.

ICK31004I VTOC CREATION FAILED

Explanation: An I/O error occurred when attempting to write a volume table of contents on the volume.

System Action: The volume table of contents is not written on the volume, and the command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31006I VOLUME LABEL CREATION FAILED

Explanation: An I/O error occurred when attempting to write a volume label.

System Action: A volume label was not written, and the command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table 1, 2, 3, 4, and 29.

ICK31007I ALLTRACKS NOPRESERVE NOT SUPPORTED USE THE INITIALIZE COMMAND

Explanation: ALLTRACKS NOPRESERVE destroys a volume, including the VTOC and the volume label. This function is not supported.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Use the INIT command. If NOCHECK was specified, use a medial INIT. If CHECK was specified, use a minimal INIT.

Problem Determination: Not applicable.

ICK31012I VOLID NOT SPECIFIED AND NO VOLUME LABEL EXISTS

Explanation: A volume being initialized must either contain a volume label from which the old volume serial can be used, or the VOLID parameter must specify a new volume serial number.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Be sure that the correct volume is mounted, or specify the VOLID parameter, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31013I UNRECOVERABLE TRACK THRESHOLD MET

Explanation: The installation-specified threshold of unrecoverable tracks, set to ten by default, has been met. (An unrecoverable track is one that cannot be repaired by software: it is neither readable nor writable by the drive.)

System Action: The command terminates to prevent further damage to the disk pack. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination, and notify the customer engineer.

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK31015I UNABLE TO READ VOLUME LABEL

Explanation: An I/O error occurred when attempting to read the volume label to verify the volume serial number.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command and specify the NOVERIFY parameter, or reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31019I NEXT-AVAILABLE-ALTERNATE POINTER OR COUNTER IN VTOC IS INVALID

Explanation: The value of the pointer to the next available alternate track or the count of the number of alternate tracks that are available is in error.

System Action: Processing continues. If it is possible, the value in the VTOC is updated when processing completes.

Operator Response: None.

Programmer Response: Reinitialize the volume at either the minimal or the maximal level.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31022I UNABLE TO CHANGE VOLUME LABEL

Explanation: An I/O error occurred while attempting to change the volume serial number, the owner identification, or the address of the volume table of contents in the volume label.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31023I INVALID UNITADDRESS, SYSNAME OR DDNAME SPECIFIED

Explanation: The channel and unit addresses specified do not exist in the system I/O configuration, or the DDNAME is incorrect, or the SYSNAME is incorrect.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the value substituted for cuu, or for dname, or for sysxxx, then reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31024I UNABLE TO OPEN VOLUME

Explanation: The volume that was specified cannot be opened. The DD statement could be missing or invalid, or the channel and unit address could be invalid.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the error, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31025I VOLUME NOT MOUNTED PRIVATE

Explanation: When online initializing, inspecting, or reformatting is requested, the specified volume must be mounted PRIVATE to prevent interference by other jobs.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Be sure the volume is mounted PRIVATE, or perform the job offline.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31026I COMMAND INVALID FOR UNINITIALIZED VOLUME

Explanation: The INSPECT and REFORMAT commands can only be specified for a previously initialized volume.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Initialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31027I UNABLE TO WRITE VOLUME LABEL DURING VTOC CREATION

Explanation: An I/O error occurred when attempting to rewrite the volume label field that locates the volume table of contents.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31034I COMBINATION OF ASSIGN AND ALLTRACKS AND NOCHECK PROHIBITED

Explanation: This combination of parameters is prohibited, because there are fewer alternate tracks than primary tracks on the volume. This combination of parameters specifies unconditional assignment of alternate tracks for all the primary tracks.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Change the combination of parameters, and reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31035I UNABLE TO READ FORMAT-4 DSCB

Explanation: An I/O error occurred when attempting to read the format-4 data set control block (DSCB) for the volume table of contents. This record is read, then rewritten, to indicate the location.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31036I UNABLE TO INITIALIZE 2314 MINI DISK

Explanation: For the 2314 minidisk specification, initialization of less than 2 cylinders was requested. This is not acceptable because one cylinder is always used as a cylinder of alternate tracks.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the MIMIC(MINI(n) parameter and reissue the command.

ICK31038I NO VALID TRACKS WERE SPECIFIED

Explanation: If the TRACKS parameter specifies only invalid track addresses, this message indicates that the command was not processed.

System Action: The command te^rminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command, and specify one or more valid track addresses.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31043I NO STORAGE AVAILABLE TO HOLD RECORD BEING PRESERVED, TRACK CCHH=X'cccc hhhh'

Explanation: To preserve the contents of a track during surface checking, the complete track is read into a dynamically allocated buffer in accordance with the track capacity of the volume. There is insufficient space in which to allocate this buffer.

System Action: The track under inspection is not surface checked to avoid loss of data, and the command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Increase the available storage space, or specify the NOPRESERVE parameter if the data may be destroyed, then reissue the command.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31046I UNABLE TO WRITE FORMAT-4 DSCB AT CCHH=X'cccc hhhh'

Explanation: An I/O error occurred when attempting to update the volume table of contents. The address of the first available alternate track and the number of alternate tracks could not be written in the VTOC.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume and specify a different cylinder and track location for the volume table of contents, or issue the INSPECT command to assign an alternate track.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31049I UNITADDRESS SPECIFIED FOR VOLUME MOUNTED ON-LINE

Explanation: The UNITADDRESS parameter is valid for offline processing only, but this device was mounted online.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Mount the volume offline, or specify the DDNAME parameter.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31052I MINIMAL INITIALIZATION NOT PERMITTED FOR MSS STAGING PACK

Explanation: To initialize a pack as a Mass Storage System staging pack, the VALIDATE or the CHECK parameter must be specified to initialize the pack at medial or maximal level, respectively.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reissue the command with the VALIDATE parameter specified.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31054I DEVICE NOT SUPPORTED FOR THE SPECIFIED FUNCTION

Explanation: The volume that was specified for the command is not supported for the function as defined by the combination of parameters used. For example, ANALYZE is not valid for a 2314 device. See Figure 2 on page 4 for other incompatible functions.

System Action: Processing of the command is terminated.

Operator Response: None.

Programmer Response: Correct the control statement, and reissue the command.

ICK31056I VTOC LOCATION IN VOLUME LABEL INCORRECT

Explanation: The VTOC location specified in the standard volume label is incorrect. Therefore, addressability to the volume table of contents is lost.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume, and reestablish addressability to the volume table of contents.

ICK31057I INVALID DEVICE TYPE: VTOC INDEX NOT SUPPORTED ON THIS DEVICE

Explanation: The device type is not a valid device type for initialization with a VTOC index.

System Action: The creation of the VTOC index is not attempted. INIT command processing continues.

Operator Response: None.

Programmer Response: None.

ICK31058I cuu I/O ERROR DETECTED DURING INDEX CREATION: ERROR CODE= x

Explanation: An I/O error occurred during VTOC index creation processing. Error codes:

1 - Error occurred in reading the volume label
2 - Error occurred in reading the VTOC
3 - Error occurred in writing the VTOC
4 - Error occurred in writing index records
5 - Index extent was violated; increase index size

System Action: VTOC index creation processing is terminated. The DOS volume indicator is turned on in the VTOC. INIT command processing continues.

Operator Response: Refer the error indication to the system coordinator for Problem Determination.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4, 29.

ICK31059I INDEX STARTING LOCATION INVALID AS SPECIFIED

Explanation: The INDEX parameter on the INIT command statement is invalid. The starting location, as specified, is not valid for one of the following reasons:

- It caused an overlap with the VTOC
- It defined cylinder 0, track 0 as the starting location of the index data set
- It was outside the physical limits of the device
- The relative track specified is invalid for the device

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Check the values specified for the INDEX parameter, and correct the value in error. Resubmit the job.

ICK31061I cuu VTOC INDEX CREATION SUCCESSFUL: VOLUME NOW IN INDEX FORMAT

Explanation: The VTOC index was successfully created on the volume.

System Action: None.

Operator Response: None.

Programmer Response: None.

ICK31062I cuu VTOC INDEX CREATION FAILED: RETURN CODE= 8

Explanation: Index creation was unsuccessful.

System Action: None.

Operator Response: None.

Programmer Response: Check the job output for additional information on the reason for job failure.

ICK31063I UNABLE TO READ HOME ADDRESS BEFORE DATA SAVED FROM CCHH=X'cccc hhhh'

Explanation: Before the data on a track can be read, the home-address is read from the specified track. This read operation failed. For this specific case, the command processing terminates. In every other case, that is, where data is not preserved (NOPRESERVE specified), an attempt is made to recover the home-address, but recovery generally involves erasure of the rest of the track.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Attempt to recover the data on the track; if successful, reissue the command with the NOPRESERVE option. An attempt will be made to recover the home-address.

ICK31064I UNABLE TO READ RECORD ZERO BEFORE DATA SAVED FROM CCHH=X'cccc hhhh'

Explanation: Before the data on a track can be read, the record 0 is read from the specified track. This read operation failed. For this specific case, the command processing terminates. In every other case, an attempt will be made to recover the record 0, but recovery generally involves erasure of the rest of the track.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Attempt to recover the data on the track; if successful, reissue the command with the NOPRESERVE option. An attempt will be made to recover the record 0.

ICK31300I VERIFICATION FAILED: VOLUME-SERIAL WRONG

Explanation: The VERIFY parameter was specified and the specified volume serial number does not match the volume serial number found in the volume label.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Ensure that the correct volume is mounted, correct the volume serial number specified in the command, or specify the NOVERIFY parameter.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31301I VERIFICATION FAILED: OWNER-ID WRONG

Explanation: The VERIFY parameter was specified, and the specified owner identification does not match the owner identification found in the volume label.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Ensure that the correct volume is mounted, correct the owner identification specified in the command, or specify the NOVERIFY parameter.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31303I UNABLE TO VERIFY AUTHORIZATION FOR PROTECTED DATA SET

Explanation: At attempt was made to scratch a data set, but the user was not authorized to do so.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Obtain the proper authorization, or reissue the command in the offline mode.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31304I SYSTEM OPERATOR DID NOT CONFIRM DATA SET PURGING

Explanation: The operator replied T to message ICK001D.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Determine if the data may be purged and, if so, reissue the command and reply U to message ICK001D.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31305I UNEXPIRED OR PASSWORD PROTECTED DATA SET FOUND ON VOLUME

Explanation: When attempting to initialize a volume online with the NOPURGE parameter specified, unexpired data sets or password-protected data sets were found that prevent initialization of the volume.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: If the unexpired data sets may be purged, reissue the command and specify the PURGE parameter, or process the volume offline.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31324I VOLUME CONTAINS VSAM DATA SET(S)

Explanation: The volume being processed online contains one or more VSAM data sets.

System Action: The data sets are not destroyed, and the command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Use Access Method Services to delete the VSAM data sets, or initialize the volume offline.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31325I OPERATOR REFUSED PURGE PERMISSION

Explanation: The operator responded T to message ICK003D.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Determine why the request to process was refused, and reissue the command.

Problem Determination: None.

ICK31326I IMPROPER RACF ACCESS AUTHORITY

Explanation: A volume that is RACF protected cannot be processed unless the user has the proper level of authorization.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Obtain the proper level of authorization, or process the volume in offline mode.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31327I NO STORAGE AVAILABLE FOR MAXIMUM TRACK CAPACITY RECORD

Explanation: No storage was available to build the bit pattern in a main storage buffer that would eventually be written on the volume during surface check.

System Action: The command terminates. Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: Specify a larger region size for the job step, and resubmit the job.

ICK31329I SURFACE ANALYSIS CYLINDER COULD NOT BE READ

Explanation: For the 3375 or 3380, an error occurred accessing the surface analysis cylinder. Skip displacement information could not be recovered.

System Action: The current track is flagged not recoverable. Device Support Facilities continues processing on the next track.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, 30.

ICK31401I cuu SUSPECTED DRIVE PROBLEM

Explanation: During the drive tests, ANALYZE detected an error. During the data verification test, ANALYZE detected an error other than a data check.

System Action: ANALYZE processing terminates, and message ICK406I (ICK01406I) is issued.

Operator Response: Depending on your installation's procedures, you might do the following:

- Restore the entire volume to another drive from a backup volume.
- Discontinue using the drive.

Save the console output and ANALYZE's printer output, which contain further information about the hardware problems.

Take the action appropriate to your installation's procedures for handling suspected equipment problems. If the problem recurs, contact your IBM Customer Engineer or Service Representative.

Problem Determination: Table I, items 1, 2, 3, 4, 30.

ICK31402I cuu ERROR READING DATA

Explanation: ANALYZE detected data checks while reading data. This message is followed on the printer by a message that identifies the track and cylinder number on which each data check occurred. The cause of the problem could be a damaged disk surface or an intermittent read/write circuitry failure.

System Action: ANALYZE processing terminates, and message ICK406I (ICK01406I) is issued.

Operator Response: Depending on your installation's procedures, you might do one of the following:

- Restore the entire volume from a backup volume.
- Rebuild the track that has the error.
- Assign an alternate track and then restore the track.
- Rebuild the data set.

Save the console output and ANALYZE's printer output, which contain further information.

ICK31403I cuu DATA SCAN VALUES INVALID, testing terminated

Explanation: The relative block number(s), tracks, or cylinders specified by the LIMITS parameter are invalid.

System Action: Data verification is not done.

Operator Response: Specify valid relative block number(s), tracks, or cylinders in the LIMITS parameter, and resubmit the request.

ICK31404I cuu VOLUME HAS UNFORMATTED DATA BLOCKS

Explanation: An attempt was made to read a data block which was not initialized (data field not written).

System Action: After 504 data checks, the ANALYZE command is terminated.

Operator Response: Perform appropriate procedures to recover all desired data from the volume and then run the DOS utilities INTDK or INTDSK with the 'IQ' option to initialize all data blocks.

ICK31410I MAIN STORAGE NOT AVAILABLE, TESTING TERMINATED

Explanation: Dynamic acquisition of storage for work areas and control blocks failed.

System Action: ANALYZE command processing is terminated.

Operator Response: Increase main storage size.

ICK31411I INCORRECT DEVICE TYPE, TESTING TERMINATED

Explanation: The device type specified for the ANALYZE volume is not supported by ANALYZE.

System Action: ANALYZE processing is terminated.

Operator Response: See Figure 2 on page 4 for valid device types.

ICK31412I DEVICE NOT READY, TESTING TERMINATED

Explanation: A condition occurred that caused "Intervention Required" to be posted in the failing CSW sense byte.

System Action: The ANALYZE command is terminated.

Operator Response: Ready the drive, and reissue the command.

ICK31413I DATA FORMAT UNACCEPTABLE, TESTING TERMINATED

Explanation: Data on the cylinder is written in a format other than the IBM standard format, or an intermittent drive error occurred during the data verification test, or the volume under test was accessed by another program that erased an EOD record after it was read by the data verification test and before it was reread by the test.

System Action: ANALYZE processing is terminated.

Operator Response: None.

ICK31505I cuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST REJECTED

Explanation: The format of the VTOC is currently the same as the format requested in the BUILDIX command statement. '**' identifies the format of the VTOC, either OS or IX.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Check the command statement. The format requested must be opposite from the current VTOC format as identified in this message. Be certain that the JCL DD statement correctly identifies the volume. Change the statement(s) where required, and resubmit the job.

ICK31509I cuu DIRF FLAG SET IN VTOC, BUILDIX CANNOT PROCEED

Explanation: An error occurred during VTOC processing on a previous job, causing the DADSM interrupt flag to be set in the VTOC. The VTOC is not accurate.

System Action: Execution of the command is terminated.

Operator Response: Prepare a job that will cause reconstruction of the VTOC, and run it against the volume. (For example, run an IEFBR14 job to allocate a temporary data set to the volume.) On conclusion of this job, resubmit the BUILDIX command.

Programmer Response: None.

ICK31510I cuu BUILDIX REQUEST CANCELLED DUE TO OPERATOR ACTION

Explanation: The operator replied 'CANCEL' to a message requiring a response.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Check with the operator for the reason for cancellation of the job.

ICK31511I cuu CVAF ERROR: RETURN CODE= ERROR CONDITION= *****

Explanation: The common VTOC access facility returned to Device Support Facilities with a return code indicating either a logical error or a physical error. Return codes have the following meanings:

4, 12
Indicate logical errors

8
Indicates an invalid index structure

16
Indicates an I/O error

The error condition will be printed only for a return code of 4 or 8. See Appendix B of Data Facility Device Support: User's Guide and Reference for more information on these error conditions.

System Action: Execution of the command terminates with the following conditions existing, depending on the return code:

4, 8, 12
The volume is left in OSVTOC format.

16
The volume is left as it was before the command was issued.

Operator Response: None.

Programmer Response: Refer to the DADSM program logic manual for a full explanation of CVAF return codes and error condition codes.

ICK31512I cuu ERROR: SYS1.VTOCIX. IS A VIO DATASET. BUILDIX TERMINATED.

Explanation: The index data set was allocated as a VIO data set and is not supported by the BUILDIX command.

System Action: Execution of the command terminates with a return code of 12. The VTOC is left unchanged.

Operator Response: None.

Programmer Response: Ensure that allocation of the index data set specifies a permanent data set. Check the JCL statement that defines the index data set and change the parameter. Resubmit the job.

ICK31514I INDEXED VTOC FACILITY NOT ON SYSTEM. BUILDIX TERMINATED.

Explanation: A request was made to change a VTOC to IXVTOC format, but the system does not contain indexed VTOC programming support.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: None.

ICK31515I cuu BUILDIX COMMAND FAILED. RETURN CODE= 8

Explanation: An error occurred that caused execution of the command to be terminated.

System Action: Execution of the command is terminated.

Operator Response: None.

Programmer Response: Check the job output for messages describing the type of failure.

ICK31516I cuu I/O ERROR DETECTED DURING VTOC CONVERSION: ERROR CODE= *

Explanation: An I/O error occurred during BUILDIX processing. Error codes:

1 - Error occurred in reading the volume label
2 - Error occurred in reading the VTOC
3 - Error occurred in writing the VTOC
4 - Error occurred in writing index records
5 - Index extent was violated; increase index size

System Action: Execution of the BUILDIX command is terminated.

Operator Response: Refer the error indication to the system coordinator for Problem Determination.

Programmer Response: None.

ICK31517I cuu ERROR: VOLUME IS A DOS STACKED PACK

Explanation: The volume being processed has a VTOC on the first track of the volume. VTOC conversion is not possible on such a volume.

System Action: Execution of the command is terminated.

Operator Response: None

Programmer Response: Correct the problem on the volume, possibly by initializing the volume with an INIT command. Note, however, that this will purge all existing data on the volume.

ICK31518I cuu ERROR: VOLUME CONTAINS SPLIT CYLINDER EXTENTS

Explanation: It was found that the volume contains one or more shared extent data sets. These are not supported by the BUILDIX command.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

Programmer Response: None.

ICK31519I cuu ERROR: SYS1.VTOCIX. DATASET NOT FOUND ON VOLUME

Explanation: The index data set could not be found on the volume.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

Programmer Response: Check the job control statements to see if a DD statement exists that will cause allocation of the index data set. If the statement exists, check if the name is specified correctly. Correct the error and resubmit the job.

ICK31520I cuu ERROR: DUPLICATE INDEX DATASET NAME FOUND ON VOLUME

Explanation: Two data sets were found on the volume that had names beginning with SYS1.VTOCIX. Only one is allowed per volume.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

Programmer Response: Submit a job to scratch one of the data sets, or scratch both data sets if new index allocation is desired.

ICK31521I cuu ERROR: INDEX DATASET EXTENT NOT CONTIGUOUS

Explanation: This data set was found to occupy more than one extent. The index data set must occupy one, and only one, extent.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: None.

Programmer Response: Scratch the invalid index data set, and resubmit the job with a job control statement that will ensure that only one extent is allocated to the index.

ICK31522I INVALID DDNAME SPECIFIED

Explanation: The DDname is incorrect in the command statement.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: Correct the job control statement, and resubmit the job.

Programmer Response: None.

ICK31524I UNABLE TO OPEN VOLUME

Explanation: The volume specified cannot be opened. The DD statement could be missing or invalid.

System Action: Execution of the BUILDIX command is terminated.

Operator Response: Correct the error, and resubmit the job.

Programmer Response: None.

ICK31602I INCORRECT DEVICETYPE, MAPALT TERMINATED

Explanation: The device type specified is not supported by the MAPALT command.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Specify the correct device type in the DEVICETYPE keyword of the command statement, and resubmit the job. MAPALT can only be executed on fixed block devices in fixed block mode.

Programmer Response: None.

ICK31603I UNABLE TO OPEN VOLUME

Explanation: The volume that was specified cannot be opened. The ASSGN statement could be missing or invalid, or the channel and unit address could be invalid.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Correct the error, and resubmit the job.

Programmer Response: None.

ICK31604I cuu LIMITS PARAMETER INVALID AS SPECIFIED, MAPALT TERMINATED

Explanation: The relative block number(s) specified by the LIMITS parameter are invalid.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Correct the value(s) in the LIMITS parameter, and resubmit the job.

ICK31605I cuu UNRECOVERABLE I/O ERROR DETECTED, MAPALT TERMINATED

Explanation: An unrecoverable I/O error (other than a data check) was encountered.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Check the job output, which will contain diagnostic information to aid in analyzing the error. Execute the Device Support Facilities ANALYZE command as a Problem Determination aid, and follow installation procedures for recovery from this type of error.

Programmer Response: None

ICK31607I cuu MAPALT ABNORMALLY ENDED, REPORT MAY BE INCOMPLETE

Explanation: This message is printed after an error has been encountered that caused execution of the command to be terminated. The report may be incomplete.

System Action: None.

Operator Response: Check previous messages on job output, and follow installation procedures.

Programmer Response: None.

ICK31611I MAIN STORAGE NOT AVAILABLE, MAPALT TERMINATED

Explanation: Dynamic acquisition of storage for control blocks and work areas failed.

System Action: Execution of the MAPALT command is terminated.

Operator Response: Increase main storage size, and resubmit the job.

Programmer Response: None.

| **ICK31700I VTOC EXTENT INVALID**

| **Explanation:** The ending block number of the VTOC, which was computed from the FBAVTOC parameter, exceeds the highest block number of the FBA device being initialized.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the FBAVTOC parameter so the ending parameter is within the device limits, and rerun the job.

Problem Determination: None.

ICK31705I ALTERNATE BLOCKS EXHAUSTED

Explanation: A prime block needed an alternate but all available alternate blocks have already been assigned.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume with RECLAIM specified to free up some alternate blocks. If this is not successful, seek hardware support.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31709I I/O ERROR FORMATTING BLOCK IDENTIFIER

Explanation: An uncorrectable error occurred while formatting the block identifier field of a block on a 3370.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Seek hardware support.

Problem Determination: Table I, items 1,2,3,4 and 30.

ICK31710I I/O ERROR FORMATTING BAD BLOCK XXXXXX

Explanation: An uncorrectable error occurred while formatting the defective block xxxxxx.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Seek hardware support.

Problem Determination: Table I, items 1,2,3,4 and 30.

ICK31711I CANNOT READ SA INFORMATION

Explanation: Because of an I/O error, the SA information—factory-flagged list—cannot be read.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Seek hardware support.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31712I INVALID SA INFORMATION FORMAT

Explanation: The data format of SA information—factory flagged list—is in error. Typically, the end of data is not found.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Seek hardware support.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31713I CANNOT READ PRIME CYLINDER IDS

Explanation: An uncorrectable I/O error occurred while reading the ID fields of prime blocks.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Seek hardware support.

Problem Determination: Table I, items 1,2,3,4 and 30.

ICK31716I INVALID PARAMETER(S) FOR DEVICE TYPE: list of parameters

Explanation: Parameter(s) in the parameter list are invalid for device type being processed. For example, VTOC parameter specified for an INIT of an FBA device.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct parameter(s), and rerun the job.

Problem Determination: None.

ICK31717I VERIFICATION FAILED: VOL1 LABEL DOES NOT EXIST

Explanation: Verification was requested, but failed because the volume being initialized does not have a VOL1 label to use for the verify. This may indicate this is the wrong volume.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Resolve the conflict, and rerun the job.

Problem Determination: None.

ICK31718I INIT FAILED: VOLID NOT SPECIFIED AND I/O ERROR READING VOLUME LABEL

Explanation: The VOLID parameter is not specified, and because of an I/O error, reading the volume label, a volume serial is not available.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Try specifying VOLID. If this is not successful, investigate the cause of the I/O error reading the volume label.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31722I VERIFICATION FAILED: I/O ERROR READING VOL1 LABEL

Explanation: An uncorrectable I/O error occurred reading the VOL1 label. Verification cannot continue

System Action: Diagnostic information is printed on the output device. The command is terminated. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume, specifying NOVERIFY and a VOLID. Start recovery procedures for data on the volume.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31728I FBA MINIDISK NOT SUPPORTED IN THIS ENVIRONMENT

Explanation: Fixed block architecture minidisks are not supported in DOS, VS1, or MVS environments.

System Action: The command terminates. Processing continues with the next command.

Operator Response: None.

Programmer Response: Execute the command in the stand-alone environment.

Problem Determination: None.

ICK31748I COMMAND CANNOT BE EXECUTED - DEVICE ACCESS LIMITED

Explanation: The current command cannot be executed because certain types of access are prohibited for the device you have specified. For example, a diagnostic control CCW cannot be issued for a VM minidisk.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check that the command you issued is compatible with the specified device.

Problem Determination: None.

ICK31749I DEVICE TYPE NOT SUPPORTED IN THIS ENVIRONMENT

Explanation: Fixed block architecture devices are not supported in the VS1 or MVS environment.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Execute the command in the stand-alone or DOS environment.

Problem Determination: Table I, items 1, 3, and 4.

ICK31750I TRACKS OR ALLTRACKS PARAMETER REQUIRED FOR CKD DEVICES

Explanation: BLOCKS was specified for a count-key-data device. You must specify either TRACKS or ALLTRACKS for these devices.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Resubmit the job, specifying either TRACKS or ALLTRACKS.

Problem Determination: Table I, items 1, 3, and 4.

ICK31751I BLOCKS PARAMETER REQUIRED FOR FBA DEVICE

Explanation: TRACKS OR ALLTRACKS was specified for a fixed block architecture device. You must specify BLOCKS for these devices.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Resubmit the job, specifying BLOCKS.

Problem Determination: Table I, items 1, 3, and 4.

ICK31753I NO VALID BLOCK NUMBERS SPECIFIED

Explanation: All the block numbers specified by the BLOCKS parameters were invalid. This message is preceded by one or more ICK11752I messages.

System Action: The command terminates. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Resubmit the job, specifying the correct block number(s) in the BLOCKS parameter.

Problem Determination: Table I, items 1, 3, and 4.

ICK31756I READ FOR PRESERVE OF BLOCK xxxxxx FAILED: UNRECOVERABLE I/O ERROR

Explanation: The user data on block xxxxxx could not be read because of unrecoverable I/O errors.

System Action: Diagnostic information is printed on the output device and processing of the block is terminated to prevent loss of the user data on the block. Command processing continues with the next valid block specified in the BLOCKS parameter.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31757I READ FOR PRESERVE OF BLOCK xxxxxx FAILED: INSPECT ECC CORRECTION LOGIC FAILED

Explanation: The read for the user data on block xxxxxx failed with an error correction code (ECC) correctable error, and the ECC correction information in the sense did not correspond to the expected information for the executed CCW chain.

System Action: Diagnostic information is printed on the output device, and processing of the command is terminated. Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: None.

Problem Determination: Table I, items 1, 2, 3, 4 and 29.

ICK31758I USER DATA ON BLOCK xxxxxx LOST

Explanation: Command processing failed with a permanent error. Device Support Facilities was unable to restore the user data on block xxxxxx.

System Action: The command is terminated. Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: Start recovery procedures for the data set containing block xxxxxx.

Problem Determination: Table I, items 1, 2, 3, 4 and 29.

ICK31762I CHECK FUNCTION FOR BLOCK xxxxxx FAILED: UNRECOVERABLE I/O ERROR

Explanation: An unrecoverable I/O error occurred during surface analysis of block xxxxxx.

System Action: Diagnostic information is printed on the output device. The command is terminated, and Device Support Facilities continues with the next command. If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4 and 30.

ICK31763I ASSIGN FUNCTION FOR BLOCK xxxxxx FAILED: NO ALTERNATE BLOCKS AVAILABLE

Explanation: An attempt was made to assign an alternate to block xxxxxx, and there are no more alternates available.

System Action: The command is terminated. Device Support Facilities continues with the next command. If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator Response: None.

Programmer Response: Reinitialize the device.

Problem Determination: Table I, items 1, 2, 3, and 4

ICK31764I ASSIGN FUNCTION FOR BLOCK xxxxxx FAILED: FORMAT DEFECTIVE BLOCK ERROR

Explanation: An unrecoverable error occurred while using the format defective block CCW chain to assign a new alternate to block xxxxxx.

System Action: Diagnostic information is printed on the output device. The command is terminated, and Device Support Facilities continues with the next command. If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK31766I ASSIGN FUNCTION FOR BLOCK xxxxxx FAILED: NO NON-DEFECTIVE ALTERNATES FOUND

Explanation: The format defective block CCW chain was retried 10 times for block xxxxxx and all ten assigned alternates failed surface analysis.

System Action: The command is terminated, and Device Support Facilities continues with the next command. If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator Response: None.

Programmer Response: See Problem Determination

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK31767I ASSIGN FUNCTION FOR BLOCK xxxxxx FAILED: UNRECOVERABLE I/O ERROR OCCURRED DURING SURFACE ANALYSIS

Explanation: An unrecoverable I/O error occurred during surface analysis of the alternate assigned to block xxxxxx.

System Action: Diagnostic information is printed on the output device. The command is terminated and Device Support Facilities continues with the next command. If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator Response: None.

Programmer Response: See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK31768I INVALID LOGICAL AND PHYSICAL DEVICE COMBINATION FOR REQUESTED FUNCTION

Explanation: The logical and physical device types were not equal. This was determined from the information returned from the sense ID (Sense I/O Type) CCW. Emulation of fixed block architecture devices is not supported by Device Support Facilities.

System Action: The command is terminated, and Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: Verify the device configuration is supported by Device Support Facilities. See Problem Determination.

Problem Determination: Table I, items 1, 2, 3, 4, and 29.

ICK31769I DEVICE BLOCK SIZE OF nnnn NOT SUPPORTED

Explanation: The block size (nnnn) information returned by the device from a read device characteristics CCW does not equal 512.

System Action: The command is terminated, and Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: See Problem Determination

Problem Determination: Table I, items 1, 3, 4, and 30.

ICK31772I INSUFFICIENT STORAGE AVAILABLE TO READ VTOC

Explanation: Dynamic acquisition of storage for an input buffer failed.

System Action: The command is terminated and Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: Increase the amount of storage available for GETMAIN/GETVIS.

Problem Determination: Table I, items 1, 3, and 4.

ICK31773I VOL1 LABEL NOT FOUND

Explanation: An online volume does not have a VOL1 label.

System Action: The command is terminated, and Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: Initialize the volume, or rerun the command in the stand-alone environment.

Problem Determination: None.

ICK31774I I/O ERROR READING VOL1 LABEL

Explanation: A permanent I/O error occurred reading the VOL1 label.

System Action: Diagnostic information is printed on the output device. The command is terminated, and Device Support Facilities continues with the next command.

Operator Response: None.

Programmer Response: Reinitialize the volume, and start recovery procedures for the data on the volume. The INIT command for reinitialization must specify the NOVERIFY and VOLID parameters.

Problem Determination: Table I, items 1, 2, 3, 4, and 30.

ICK40227I AN 'ELSE' COMMAND APPEARS IMPROPERLY

Explanation: An ELSE clause appeared in the command without a corresponding IF statement.

System Action: The remainder of the command is ignored. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the command syntax, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40228I AN 'END' COMMAND IS INVALID

Explanation: An END statement was encountered without a matching DO statement.

System Action: The remainder of the command is ignored. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the DO-END sequence, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40229I 'IF' COMMAND HAS INVALID RELATIONAL EXPRESSION

Explanation: The IF-THEN-ELSE statement sequence is incorrect. Only the system variables LASTCC and MAXCC can be specified, and the values must be decimal numbers from 0 through 99999.

System Action: The remainder of the command stream is ignored. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the requirements of the IF-THEN-ELSE statement sequence, correct the error, then reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40230I 'SET' COMMAND HAS INVALID ASSIGNMENT EXPRESSION

Explanation: A SET statement has invalid syntax. Only the system variables LASTCC and MAXCC can be assigned values, and the values must be decimal numbers from 0 through 99999.

System Action: The remainder of the command stream is ignored. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Check the syntax requirements of the SET statement, correct the error, then reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40232I IMPROPER OR MISSING 'THEN' KEYWORD

Explanation: The THEN clause of the IF-THEN-ELSE command sequence is missing or is misspelled.

System Action: The remainder of the command stream is ignored. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Correct the error, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40236I INPUT STREAM END-OF-FILE FOUND BEFORE END OF COMMAND

Explanation: An end-of-file condition was encountered while scanning the command. This could be caused by incorrect command-continuation syntax or missing records in the input stream.

System Action: The command terminates.

Operator Response: None.

Programmer Response: Correct the command syntax, or add the missing records, then reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40237I TOO MANY LEVELS OF 'IF' COMMAND NESTING

Explanation: More than ten IF statements have been nested.

System Action: The remainder of the command stream is ignored. Device Support Facilities processing continues with the next command.

Operator Response: None.

Programmer Response: Restructure the command stream to avoid the excessive nesting, and reissue the command.

Problem Determination: Table I, items 2, 4, and 29.

ICK40999I UABORT CODE nn

Explanation: This message indicates a termination error causing the Device Support Facilities processor to abort. This situation is usually caused by program or system errors. The message appears in the output listing via the write-to-programmer SVC. Code _nn_ indicates the nature of the error.

Code	Meaning
24	Text processor's print control table not addressed by the GDT
28	No virtual storage available for:

- Page header line

- Argument lists
- Main title line
- Footing lines
- Print control table (PCT)
- Initialization of the I/O adapter historical data and message area
- Automatic (dynamic) storage for a module which uses preallocated automatic storage
- A GETMAIN/GETVIS request
- Space for STAE control block
- Open control-block allocation
- Device Information Table (DIT)

Note: The message that sufficient storage was not available could not be issued because the SYSPRINT data set is not open.

32 Request made to process unopened data set

33 Unable to cancel STAE control

36 Processor unable to open SYSPRINT (or whichever DD name is used to denote the processor's standard listing output data set)

40 Invalid U-macro argument list:

UOPEN, UCLOSE, UPUT,
UGSPACE, UGPOOL, UFPOOL
UTIME
UVOLCHK, UWTO
USTAE

44 Processor is unable to produce a dump (the SNAP system service was not successful: either the DSFDUMP data set could not be opened, or not enough storage was available)

52 Module not found for ULOAD

72 Unsupported device type

80 Invalid ACTIONKEY value

88 Operator replied "T" to message ICK014D

92 Dynamic device information table (DIT) does not exist.

96 Equipment check occurred on device that is being processed

System Action: Device Support Facilities terminates.

Operator Response: Notify the system programmer.

Programmer Response: Correct the cause of the error, and restart Device Support Facilities.

Problem Determination: Table I, items 1, 2, 3, 4, 29, and 30.

APPENDIX D. PROBLEM DETERMINATION TABLES

Problem determination is the activity required to identify a failing hardware unit or program and to determine who is responsible for support.

Problem determination is accomplished by using procedures specified by IBM. In some cases, these procedures may be initiated by a message or code that requires operator or programmer response. The response may include the requirement for additional problem-related data to be collected and will attempt, where possible, to indicate "probable" failure responsibility.

Problem determination information is included (for OS/VS) for applicable messages and codes under the heading "Problem Determination." Standard problem determination actions are identified as items of Tables I and II. Unique actions are identified following the list of standard actions to be taken. In any case, it is intended that the specified actions be taken before calling IBM for support.

TABLE I

If the problem occurs again, follow the problem determination aids specified by the associated message or code before calling IBM for support:

1. If MSGLEVEL=(1,1) was not specified in the JOB statement, specify it and rerun the job.

2. Save the console sheet from the primary console. In systems with remote consoles, save the remote console sheet. In systems with Multiple Console Support (MCS), save a copy of the hard copy log.

3. Save the job stream associated with the job.

4. Save the system output (SYSOUT) associated with the job.

5. Make sure that the failing job step includes a:

   a. SYSABEND DD statement

   b. SYSUDUMP DD statement

   c. PLIDUMP DD statement

   d. SYSMDUMP DD statement

6. Make sure that the PARM parameter of the EXEC statement specifies the following:

   a. MAP

   b. LIST

   c. DIAG

   d. MSG=AP

   e. CORE, if applicable

   f. XREF

   g. DUMP

7. If SMP is used to make all changes to the system, run the LIST CDS and LIST PTFBY functions of SMP to obtain a list of the current maintenance from the SMP control data set (CDS).

If any changes are made to the system without using SMP, run the LISTIDR function of the AMBLIST or HMBLIST service aid program to obtain a list of all members with a PTF or local fix, and save the output. Run the program against the:

   a. SYS1.LINKLIB data set

   b. SYS1.SVCLIB data set

   c. Library containing the program that issued the message

   d. SYS1.LPALIB data set

8. Run the IMCJOBQD (stand-alone) or IMCOSJQD (system-assisted) service aid program to obtain a formatted copy of the contents of the SYS1.SYSJOBQE or SYS1.SYSWADS data sets, SWADS or the resident job list.

9. Run the AMBLIST or HMBLIST service aid program to obtain:

   a. An object module listing, specifying the LISTOBJ function

   b. A load module map and cross-reference listing, specifying the OUTPUT=BOTH option of the LISTLOAD function

10. Have a copy of the Message Control Program (MCP) available.

11. Run the AMDSADMP or HMDSADMP service aid program to dump the contents of real storage and page data sets on magnetic tape.

    After restarting the system, process the appropriate function of the AMDPRDMP or HMDPRDMP service aid program to print the required portion of the dump tape produced by that program.

    Save both the tape from the AMDSADMP or HMDSADMP service aid program (should further information from the tape be required) and the listing from the AMDPRDMP or HMDPRDMP service aid program.

12. Run the SEREP program, and save the resulting output.

13. Save all the associated output.

14. The normal response to this message requests the programmer and/or operator to run a specific program. Save all output from that program.

15. Save the program listing associated with the job.

16. Save the dump.

17. Have the system-generation (SYSGEN) output available from:

    a. Stage I

    b. Stage II

18. Run the IFCEREP1 service aid program to dump the SYS1.LOGREC data set and save the resulting output. For MSS, run the following program to dump the SYS1.LOGREC data set.

    a. Service aid IFCISDA0

    b. Program ISDASDA0 with the DETAIL(ALL) parameter

19. Save the assembly listing associated with the job.

20. Save the control cards associated with the job.

21. Save the compiler output associated with the job.

22. Save the source input associated with the job.

23. Save the source program listing associated with the job.

24. Run OLTEP diagnostics for the problem device and save the output.

25. Run the IEHLIST system utility program to obtain a list of the:

    a. Volume table of contents of the associated volume, specifying the FORMAT option

    b. Volume table of contents of the associated volume, specifying the DUMP option

    c. Directory of the associated data set

    d. System catalog (if it is not a VSAM catalog)

26. Run the IEBPTPCH data set utility to print the:

    a. Directory of the applicable data set

    b. Applicable data set

    c. Applicable member

    d. Applicable procedure

27. Have the linkage editor/loader map available.

28. Save the associated volume.

29. Contact IBM for programming support.

30. Contact IBM for hardware support.

31. Save the trace output data set.

32. Print the GTF trace data set with the AMDPRDMP or HMDPRDMP service aid program using the EDIT statement.

33. Print the associated SVC dump data set, with the AMDPRDMP or HMDPRDMP service aid program using the GO statement.

34. Issue the Access Method Services LISTCAT command to list:

    a. The contents of the applicable catalog

    b. The catalog entries for the applicable objects and any related objects

35. Issue the following Access Method Services command:

    a. The MSS LISTMSF command for mountable volumes

    b. The MSS LISTMSF command with the CARTRIDGES parameter

    c. The PRINT command to list the contents of the mass storage volume control inventory data set

    d. The LISTMSVI command

    e. The LISTMSF command with the ALL parameter

36. Issue the Access Methods Services PRINT command to print the repair workfile.

37. Run the AMASPZAP or HMASPZAP service aid program using the ABSDUMP statement to print the contents of the applicable:

    a. Data set

    b. Track, and save all associated output

38. Issue the Access Method Services AUDITMSS command with the following:

    a. The CHECK parameter

    b. The MAP parameter

    c. The READLABEL parameter

39. Issue the Access Method Services CHECKMSS command.

40. Issue the Access Method Services COMPARET command.

41. Issue the Access Method Services DUMPMSS command to dump the following:

    a. Formatted mass storage control storage

    b. Mass storage control main storage

    c. Mass storage control extended storage

    d. Formatted Staging Adapter storage

    e. Staging Adapter main storage

    f. Staging Adapter extended storage

    g. Mass storage control tables

42. Save the latest output from the Mass Storage Control Table Create program.

43. Display the units for devices associated with the problem area. If a specific unit or units are not known, display the range of all virtual units. See your path chart for address ranges.

44. Obtain the RACF profile of the associated data set where applicable.

45. Stop the processing unit and use the hardware ALTER/DISPLAY facility to display:

    a. All general purpose registers

    b. The page status word

    c. Main storage locations 0-200 (hexadecimal) and 7000-7080 (hexadecimal)

46. If the AMDSADMP or HMDSADMP program resides on tape, save the tape. If it resides on disk, use the DUMP feature of the IEHDASDR program to print the SYS1.PAGEDUMP data set and cylinder 0, track 0 of this residence disk.

47. Save the output (listings) of the stage 1 and stage 2 AMDSADMP or HMDSADMP initialization jobs.

48. Follow the procedures for item 9b of this table for load modules A/HMDSAPGE, A/HMDSAPRO, and A/HMDSALDR of SYS1.LINKLIB. Use IEBUPDTE or IEBPTPCH to print the A/HMDSADMP and A/MDSADM2 macros from SYS1.MACLIB.

49. Save the AMDSADMP or HMDSADMP dump output (tape or listing).

50. If the program seems to be looping, use the display PSW feature of the hardware ALTER/DISPLAY facility along with the hardware Instruction Step facility to trace the loop, instruction by instruction.

51. If there is an error in the contents of a page data set dump, restart the system using a different page data set, then dump the original page data set using the DUMP feature of IEHDASDR.

52. Use IEBCOPY to unload SYS1.IMAGELIB to tape.

53. Have a list of RACF-defined entities available.

TABLE II—GTF for Problem Determination

Format 1: Tracing Without Prompting for Event Keywords

Before reproducing the problem, have the system operator issue the START GTF command specifying the tape output, MODE=EXT, and TIME=YES. In response to the AHL100A or HHL100A message, the operator should type TRACE=opt, where opt is the trace option indicated for the particular message or code, within the text of the reply.

When data for the problem has been recorded, run the AMDPRDMP or HMDPRDMP service aid program using the EDIT statement to format the trace output, specifying DDNAME= (ddname of the trace data set).

Format 2: Tracing With Prompting for Event Keywords

Before reproducing the problem, have the system operator issue the START GTF command specifying tape output, MODE=EXT, and TIME=YES. In response to the AHL100A or HHL100A message, the system operator should specify the trace options indicated for the associated message or code within the text of the reply. Then, in response to the AHL100A or HHL100A message, the system operator should specify the event keywords also indicated with the associated message or code.

When data for the problem has been recorded, run the AMDPRDMP or HMDPRDMP service aid program using the EDIT statement to format the trace output, specifying DDNAME= (ddname of the trace data set).

Format 3: Specialized Tracing Action

Before reproducing the problem, have the system operator issue the START GTF command specifying tape output, MODE=EXT and TIME=YES. In response to the AHL100A or HHL100A message, the system operator should type 'TRACE=SYS,USR'. The DD statement for a data set in error should specify DCB=DIAGNS=TRACE.

When data for the problem has been recorded, run the EDIT function of AMDPRDMP or HMDPRDMP service aid program, specifying the options SYS and USR=FFF.

Format 4: Specialized Tracing Action for VSAM

Before reproducing the problem, have the system operator issue the START GTF command specifying tape output, MODE=EXT and TIME=YES. In response to the AHL100A or HHL100A message, the system operator should type 'TRACE=SYS,USR'. The DD statement for a data set in error should specify AMP=TRACE.

When data for the problem has been recorded, run the EDIT function of the AMDPRDMP or HMDPRDMP service aid program, specifying the options SYS and USR=(FFF,FF5).

APPENDIX E. THE VTOC INDEX

The VTOC index is a separate, sequential data set containing four record types that give information on volume and VTOC status. Systems that contain and use indexed VTOC programming support can realize performance improvements in the areas of volume space management and I/O operations to the VTOC.

The INIT and BUILDIX commands will build the VTOC index on eligible count key data devices. The INIT command creates the index during volume initialization in both operating system and stand-alone environments. The BUILDIX command, which requires that the host operating system contain indexed VTOC programming support, builds VTOC indexes on volumes currently in use on the system. Both commands prepare the VTOC on the target volume to indexed VTOC (IXVTOC) format.

The four record types in the index provide the system with a comprehensive means of space management compared to nonindexed methods. The four record types are:

1. The VTOC index map (VIXM) is the record that maps the index itself. It contains a one-for-one bit map of the records in the index, showing which records are in use (bit set to one) and which records are free to be assigned (bit set to zero). The programs reserve index space for a maximum of two VIXMs.

2. The VTOC pack space map (VPSM) contains separate bit maps for management of space on the volume at both cylinder and track level. Free and allocated space is represented in these maps. A maximum of five VPSMs are reserved by the programs.

   Note: The VPSM is built using the information in the format-4 DSCB which gives the number of cylinders on the volume as the sum of the primary cylinders plus the number of alternate cylinders. This value is shown in the VPSM. However, the alternate cylinders as well as all other unused bits in the bit maps are marked as allocated.

3. The VTOC map of DSCBs (VMDS) contains a bit map showing free (bit set to zero) and allocated (bit set to one) data set control blocks in the VTOC. A maximum of two VMDSs are reserved.

4. The VTOC index entry record (VIER) contains pointer entries to each format-1 DSCB in the VTOC. Entries are built in the VIER using the DSCB key (data set name) and the disk address (cylinder, head, record number) of the format-1 DSCB. The number of VIERs is variable to the maximum of total index records reserved minus the records used by the other three record types.

CALCULATING THE SIZE OF THE VTOC INDEX

The size of the index data set depends upon:

1. The size of the volume (total number of cylinders and tracks)

2. The track length (in bytes)

3. The number of tracks occupied by the VTOC

For the INIT command, the user may calculate the number of tracks to reserve for the index and place that value as the third, optional subparameter of the INDEX parameter; or the third subparameter may be omitted and the program allowed to calculate the size of the index. For the BUILDIX command, the user must calculate the size of the index.

In calculating the size of the index, the INIT command determines the number of VIXM, VPSM, and VMDS records needed (not exceeding the established maximum for each type), and assumes that all VTOC DSCBs are (or could be) format-1 DSCBs and that each VIER manages a maximum of 48 format-1 DSCBs; higher level VIERs and varying length data set names are taken into account by the choice of 48 format-1 DSCBs.

For efficient use of DASD space, it is recommended that you calculate the number of tracks to reserve for both the VTOC and the index data set. Figure 16 shows the maximum values for VTOC and VTOC index size for the devices that can support the VTOC index. It is not likely that the assumptions used to generate the chart would be valid in an actual situation. However, the chart places the upper limits for calculating maximum usable space. Space reserved above these limits is wasted.

DEVICE	CYLS		TRKS PER CYL	DSCBs/ TRK	INDEX RECS/ TRK[2]	MAX. VTOC[1] (TRKS)	MAX. INDEX[3] (TRKS)	# OF RECORD TYPES[4]		
	PRI	ALT						VPSM[5]	VMDS[6]	VIER[7]
2305-1	48	1	8	18	5	21	3	1	1	8
2305-2	96	1	8	34	6	23	4	1	1	17
3330	404	7	19	39	6	192	27	1	1	156
3330-11	808	7	19	39	6	384	53	2	1	312
3340 (35MB)	348	1	12	22	3	181	29	1	1	82
3344 3340 (70MB)	696	2	12	22	3	363	56	1	1	163
3350 (native)	555	5	30	47	8	347	42	2	2	328
3375	959	1	12	51	14	222	20	1	1	272
3380	885	1	15	53	18	246	15	1	1	267

[1] This maximum value assumes that all data sets on the volume are single track data sets.

[2] Index record length of 2048 bytes.

[3] This maximum value assumes that the VTOC is the maximum size.

[4] The first VIXM map will manage up to 7840 index records. (One VIXM is more than sufficient for current devices.) The second VIXM will manage an additional 16032 records.

[5] The number of VPSMs required for a device is dependent upon its size. 16032 bits are available for cylinder and track mapping in each VPSM (a maximum of 5 VPSMs is currently reserved).

[6] The first VMDS will manage 16032 DSCBs. The second (and last) VMDS will manage an additional 16032 DSCBs.

[7] Each VIER is assumed to contain 48 entries (pointers to each Format-1 DSCB).

Figure 16. Table of Maximum VTOC and VTOC Index Sizes

To calculate VTOC size, you generally determine the maximum number of data sets that will reside on the volume. The number of VTOC tracks to reserve can be easily calculated by dividing this number by the number of DSCBs per track, rounding to the next higher track.

To calculate the number of tracks to reserve for the index, first determine the average data set name length of the format-1 DSCBs which will reside on the volume. If the length chosen is too small, the data set names may not fit in the index. If the length chosen is too large, some space is unused in the index. Next determine the maximum number of data sets that will reside on the volume. Then calculate the number of VIERs needed to contain that many data set names of the chosen average data set name length, using the calculations shown below. For the number of VIXM, VPSM, and VMDS records, refer to the chart for actual numbers. (Note that the 3330-11 and 3350 will always require two VPSMs, and a 3350 with a maximum-size VTOC will require two VMDSs.) Add together the totals of all four record types and divide by the number of index records per track, rounding to the next higher track, to get the number of tracks to reserve for the index.

The value calculated for the index size is to be placed as the third subparameter of the INDEX parameter on the INIT command statement; or it is to be placed as the number of tracks to be allocated in the SPACE or ABSTR parameter in the DD statement required to execute the BUILDIX command.

The following shows the calculations to determine the number of VIERs needed to contain N data set names, each of which has an average data set name length of D. The calculations assume that all VIERs except one at each level are half filled, that a new level of the index is created when four lower level VIERs are created, and that n+1 unused VIERs are required for an n-level index.

Calculate the number of VIERs as follows where:

$\lfloor\ \rfloor$ = round quotient down to integer value

$\lceil\ \rceil$ = round quotient up to integer value
N = number of data set names in the index
D = average data set name length
E^1 = number of data set names that fit in the half-filled level 1 VIER
E^2 = number of data set names that fit in a half-filled level 2 or greater VIER
L(n) = number of VIERs at level n

$\lfloor 244/(D+8) \rfloor * 4 = E^1$ number of data set names that fit in a half-filled level 1 VIER

$\lfloor 244/(D+7) \rfloor * 4 = E^2$ number of data set names that fit in a half-filled level 2 or greater VIER

Calculate L(n) (where n is 1,2,3,...). and L(n) is the number of VIERs at level n

$\lceil N/E^1 \rceil - 1 = L(1)$ number of level 1 VIERs. Use L(n)=1 if calculation yields zero.

For n=2,3,... L(n) is calculated from L(n-1)

If $L(n-1) \geq 4$ then

$\lceil L(n-1)/E^2 \rceil - 1 = L(n)$ Use L(n)=1 if calculation yields zero.

If $L(n-1) < 4$, then there are no VIERs at level n or higher.

The total number of VIERs is

$L(1) + L(2) + \ldots + L(n)$

The assumptions used for the above calculations represent the state of the index immediately after building it using the BUILDIX command. The state of the index is such that the largest number of VIERs possible are used to contain the data set names. However, since the data set names on a volume will not all have the same length, the calculations should be used as an approximation. You should choose N (maximum number of data set names) and D conservatively to account for the varying number of data set names that will fit in a VIER.

APPENDIX F. THE FIXED BLOCK ARCHITECTURE VTOC (FBAVTOC)

FBAVTOC FORMAT CHARACTERISTICS

VTOCs on FBA devices are formatted in a similar manner to VSAM relative record data sets in that the 140-byte label records are stored in control intervals. For example, three label records fit into a 512-byte control interval. The control interval size is always an integral multiple of the device's physical block size. The upper limit is 8192 bytes.

The FBAVTOC extent is expressed in number of 'slots', which is equivalent to number of file label records. It can range from a minimum of 3 slots to a maximum of 999 slots, fitting into as many control intervals as required. The program rounds up the extent values to that of the next full control interval.

The FBAVTOC's starting location can be any physical block on the pack, except for blocks 0 and 1, which are reserved for the IPL and volume label blocks (VLB).

A standard (non-SYSRES) FBAVTOC has the following default characteristics:

- Starting location—block 2, immediately after the VLB
- Extent—56 file label records
- Control interval size—1024 bytes (or FBA block size, if larger)

LABEL RECORD FORMAT

Each record of the FBAVTOC contains 140 bytes, written as binary zeros. The first two records of the FBAVTOC are reserved for specific records:

- The data set control block (format 4) of the FBAVTOC
- The space management label (format 5)

The first 4-byte field of the space management label is written as hexadecimal 5s (X'05'). The 45th byte of the space management label is written as hexadecimal X'F5'.

Each control interval of the FBAVTOC contains a fixed number of slots and has the following format (Figure 17).

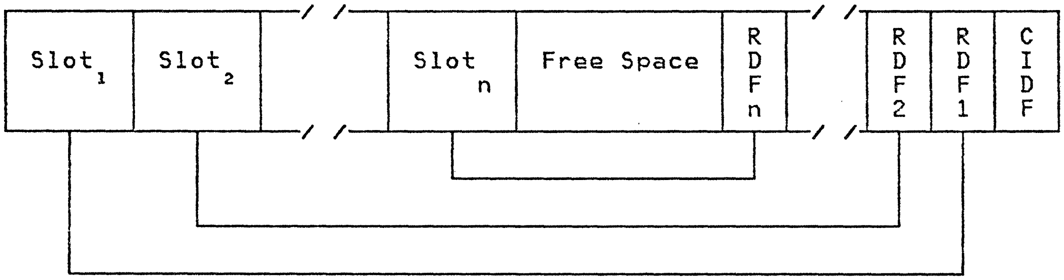


Figure 17. Format of a FBAVTOC Control Interval

There is one RDF (record definition field) associated with each slot in a control interval. The length field in the RDF (bytes 1 and 2) contains the slot length, which is equal to the label record length. Bit 5 of byte 0 of the RDF indicates whether the associated slot contains a record/label (bit 5=0) or not (bit 5=1). The RDF has one of the following contents:

- X'00008C' if the slot contains a label.
- X'04008C' if the slot does not contain a label, that is, it is empty.

The number of labels per control interval (LBPCI) is determined by the formula

```
  LBPCI = FLOOR of (CISIZE-4)/(RECSIZE+3)
```

where:

```
    FLOOR takes the integral part of the argument
    CISIZE  = control interval size
    RECSIZE = label record size, which is equal to 140
```

LBPCI is recorded in the standard volume label (VOL1) in bytes 29 through 32

The control interval definition field (CIDF) has the following format:

```
  Bytes 0,1   ·free-space offset = RECSIZE * LBPCI
  Bytes 2,3    free-space length = CISIZE-4-LBPCI * (RECSIZE+3)
```

FBAVTOC SPACE REQUIREMENTS

To calculate the space required for a fixed block architecture VTOC:

The number of labels per control interval (LBPCI) is determined by the formula

```
  LBPCI = FLOOR of (CISIZE-4)/(RECSIZE+3)
```

where:

```
    FLOOR takes the integral part of the argument
    CISIZE  = control interval size
    RECSIZE = label record size, which is equal to 140
```

The number of control intervals required for the FBAVTOC is

```
  CEILING of (number of labels specified/LBPCI)
```

where:

```
  CEILING takes the next highest integer if there is a remainder
```

The number of physical blocks reserved for the FBAVTOC is

```
  CI * (CISIZE/physical block size)
```

where:

```
  CI = number of control intervals required for the VTOC
```

APPENDIX G. SURFACE ANALYSIS

Surface analysis for a volume or track is performed when you specify the CHECK(n) parameter on either the INIT or INSPECT command.

There are two types of surface analysis, primary and skip displacement. Primary analysis is performed for all devices supported by Device Support Facilities, skip displacement analysis is performed only for the 3375 and 3380.

PRIMARY ANALYSIS

Primary analysis is performed for all devices supported by Device Support Facilities when you specify CHECK(n). It consists of writing and reading back a number of bit patterns for the specific device (see below for the values for n by device).

Primary analysis for count key data devices consists of the following:

1. A bit pattern for the specified device is written and read back once

2. If a data check is detected (correctable or uncorrectable) the following is performed:

   - For devices with skip displacement support (3375, 3380), Skip Displacement Analysis (see below) is performed on the track.

   - For devices without skip displacement support, the bit pattern is reread up to 10 times to determine if the error is repeatable. If the error is not repeatable processing continues.

     If the error is repeatable:

     - For correctable errors, a message is issued and processing continues with the next track. If you want to assign an alternate to that track, use INSPECT NOCHECK ASSIGN TRACKS

     - For uncorrectable data checks an alternate track is assigned if ASSIGN is specified.

3. This is repeated n times (from CHECK(n)) unless a data check is encountered. Each pass through uses a different device dependent bit pattern. If all the patterns for the device are used, the sequence of patterns is repeated starting with the first pattern used. See below for the values of n that write each bit pattern at least once.

Primary analysis for fixed block architecture devices consists of the following:

1. A bit pattern for the specified device is written and read back once.

2. If a correctable data check is detected, the block is reread 10 times to determine if the error is repeatable.

3. If an uncorrectable data check or repeatable correctable data check is encountered and ASSIGN is specified, an alternate is assigned and the process is restarted to analyze the surface of the alternate.

This is repeated n times (from CHECK(n)) until it is performed without encountering any uncorrectable data checks or any repeatable correctable data checks. Each pass through uses a different device dependent bit pattern. If all the patterns for the device are used, the sequence of patterns is repeated starting with the first pattern used. See below for the values of n that write each bit pattern at least once.

SKIP DISPLACEMENT ANALYSIS

Skip displacement analysis is performed only for 3375 and 3380 devices and consists of surface checking to locate and skip over defective areas on the track. If more than the maximum number of defects allowed are detected, an alternate track is assigned automatically if you are performing an INIT function or if you specify ASSIGN with the INSPECT function. Note that skip displacement analysis is a time consuming operation.

Skip displacement analysis is performed directly when you specify INSPECT TRACKS(...) CHECK(n). In this case, primary analysis is not performed and the value of n is ignored.

Skip displacement analysis is performed indirectly when you specify INSPECT ALLTRACKS CHECK(n) or INIT CHECK(n) and primary analysis indicates the possibility of a repeatable data check. Note that INSPECT ALLTRACKS is a time-consuming operation.

CHECK(N) VALUES

The n values shown below give one pass through each bit pattern. Specifying a value of n greater than these values causes the same bit pattern to be rewritten. As this is a time consuming option, you should think about performance considerations.

- 2305, 2311, 2314, 3310, 3330, 3330-1, 3344, 3350, 3370. n=3 gives one pass through each bit pattern.

- 3375, 3380. n=2 gives one pass through each bit pattern if you specify INSPECT ALLTRACKS CHECK(n) or INIT CHECK(n). If you specify INSPECT TRACKS(...) CHECK(n), skip displacement analysis is automatically performed (n is ignored).

INDEX

The entries in this index are shown as they appear in the text of the book; that is, words that appear in all uppercase in the text are also spelled that way here.

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