

IBM

MVS/DFP Version 3 Release 2

LY27-9570-0

Diagnosis Guide



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MVS/DFP Version 3 Release 2

LY27-9570-0

Diagnosis Guide

First Edition (December 1989)

This edition applies to Version 3 Release 2 of MVS/DFP™, Program Number 5665-XA3, and to any subsequent releases until otherwise indicated in new editions or technical newsletters.

Information in this edition was previously contained in LY27-9550-1.

The changes for this edition are summarized under "Summary of Changes" following the table of contents. Specific changes are indicated by a vertical bar to the left of the change. A vertical bar to the left of a figure caption indicates that the figure has changed. Editorial changes that have no technical significance are not noted.

Changes are made periodically to this publication; before using this publication in connection with the operation of IBM systems, consult the latest *IBM System/370, 30xx, 4300, and 9370 Processors Bibliography*, GC20-0001, for the editions that are applicable and current.

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Summary of Changes

First Edition, December 1989

New Programming Support for Release 2.0

Information has been added to support the Object Access Method (OAM). The new “OAM Diagnostic Aids” section of the related publication *MVS/DFP: Diagnosis Reference* is cross-referenced, and the section titled “Component Identification Keyword” on page 105 now includes the OAM component identification number.

Service Changes

The publications in the MVS/DFP Version 3 Release 2 library have new titles and order numbers. Publications listed in the preface reflect these new titles and order numbers. The MVS/DFP Version 3 Release 2 library contains support only for MVS/ESA.

Information on the Interactive Storage Management Facility (ISMF) panel IDs, member names, panel displays, and formats has been updated to reflect any changes.

Other minor technical and editorial changes have been made.

Previous Edition of Source Publication

New Programming Support for Release 1.0

Information about the Asynchronous Operations Manager (AOM) has been added as follows:

- The Introduction cites the new “AOM Diagnostic Aids” section of the related publication *MVS/DFP: Diagnosis Reference*.
- The AOM component identifier has been added to the “Component Identification Keyword” on page 105 section.
- The “Glossary” on page 125 has been updated with entries for AOM.

Information about failure symptom keywords for the Storage Management Subsystem (SMS) has been added to the following sections:

- “Preliminary Failure Source Isolation” on page 7
- “Abend Keyword” on page 13
- “Wait and Loop Keywords” on page 31
- “Message Keyword” on page 37
- “DADSM/CVAF—Modifier Keywords” on page 84
- “Component Identification Keyword” on page 105

New sections have been added for the SMS component as follows:

- "SMS—Message Keyword" on page 46
- "SMS—Incorrect Output Keyword" on page 55
- "SMS—Modifier Keywords" on page 99

Information about extended DADSM diagnostic information has been added to the "Standard Modifier Keyword List" on page 80 and "DADSM/CVAF—Modifier Keywords" on page 84 sections.

Information about the ERTB command has been added to the "ISMF—Modifier Keywords" on page 91 section.

Information about the new release level keyword (R310) has been added to the "Release Level Keyword" on page 109 section.

Service Changes

Minor technical and editorial changes have been made.

Preface

About This Book

This book is intended to help you diagnose MVS/DFP problems. It contains internal product information that is provided as additional guidance in diagnosing MVS/DFP problems. The information in this book must not be used for programming purposes.

This book helps you identify, describe, report, and resolve failures in all components of MVS/DFP. The related publication, *MVS/DFP: Diagnosis Reference*, LY27-9571, helps you gather additional failure-related data. This data may be needed by the IBM Support Center if a search of the IBM software support data base for an identical, previously reported failure proves unsuccessful.

This book directs you through a step-by-step procedure to help you build a string of standard keywords that describe common failures. All catalog and SMS types-of-failure and *some* message types-of-failure provide documentation containing a complete failure symptom string, eliminating the need for you to build one. You can use the keyword string to search an IBM software support data base such as the Software Support Facility (SSF), Info/System, or Early Warning System (EWS) to determine whether an Authorized Program Analysis Report (APAR) already documents your problem. If an APAR already exists, its text may contain the information required to resolve the problem. The resolution may be in the form of either:

- an APAR fix
- a Program Temporary Fix (PTF), or
- a bypass.

If an APAR does not yet exist, IBM Support Center personnel may request that you gather additional failure-related information. This may require using software traps or traces.

Wherever possible, this guide directs you along a keyword-build path common to all MVS/DFP components. Any component that requires component-specific activity leaves the common path to perform that activity, then returns.

Required Product Knowledge

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

- IBM Support and how it is structured
- Basic dump analysis
- Diagnostic techniques

Required Publications

You should be familiar with the information presented in the following publications:

Publication Title	Order Number
<i>Interactive System Productivity Facility Dialog Management Services</i>	SC34-2137
<i>MVS/DFP Version 3 Release 2: Customization</i>	SC26-4560
<i>MVS/DFP Version 3 Release 2: Interactive Storage Management Facility User's Guide</i>	SC26-4563
<i>MVS/DFP Version 3 Release 2: Storage Administration Reference</i>	SC26-4566
<i>MVS/ESA Diagnosis: Special Analysis Techniques</i>	LY28-1840
<i>System Modification Program Extended User's Guide</i>	SC28-1302

Related Publications

This book is intended to be used in conjunction with the related publication *MVS/DFP: Diagnosis Reference*, LY27-9571.

Some publications from the MVS/SP Version 3 library are referenced in this book. *MVS/ESA Library Guide for System Product Version 3*, GC28-1563, contains a complete listing of the MVS/SP Version 3 publications and their counterparts for the prior version.

MVS/DFP Version 3 Release 2: Guide and Master Index, GC26-4553, contains both an index to the MVS/DFP library and a summary of the changes made to the library. You can use it to:

- Find information in other MVS/DFP publications
- Determine how new programming support changes information in the MVS/DFP library
- Determine which MVS/DFP publications have been changed.

Referenced Publications

Within the text, references are made to the following publications:

Short Title	Publication Title	Order Number
DFDSS: Diagnosis	<i>Data Facility Data Set Services: Diagnosis Guide</i>	LY27-9538
DFDSS: Reference	<i>Data Facility Data Set Services: Reference</i>	SC26-4389

Short Title	Publication Title	Order Number
DFHSM: Diagnosis Guide	<i>Data Facility Hierarchical Storage Manager: Version 2 Release 5 Diagnosis Guide</i>	LY35-0098
DFHSM: Messages	<i>Data Facility Hierarchical Storage Manager: Version 2 Release 5 Messages</i>	SH35-0094
EREP User's Guide and Reference	<i>Environmental Record Editing and Printing Program User's Guide and Reference</i>	GC28-1378
Interactive Problem Control System (IPCS) User's Guide	<i>MVS/ESA Interactive Problem Control System (IPCS) User's Guide</i>	GC28-1833
ISPF Diagnosis	<i>Interactive Systems Productivity Facility Diagnosis</i>	SC34-2140
MVS/DFP: Access Method Services	<i>MVS/DFP Version 3 Release 2: Access Method Services for the Integrated Catalog Facility</i>	SC26-4562
	<i>MVS/DFP Version 3 Release 2: Access Method Services for VSAM Catalogs</i>	SC26-4570
MVS/DFP: Diagnosis Reference	<i>MVS/DFP Version 3 Release 2: Diagnosis Reference</i>	LY27-9571
MVS/DFP: Macro Instructions for VSAM Data Sets	<i>MVS/DFP Version 3 Release 2: Macro Instructions for VSAM Data Sets</i>	SC26-4569
MVS/DFP: Managing VSAM Data Sets	<i>MVS/DFP Version 3 Release 2: Managing VSAM Data Sets</i>	SC26-4568
MVS/DFP: System Programming Reference	<i>MVS/DFP Version 3 Release 2: System Programming Reference</i>	SC26-4567
MVS/DFP: Utilities	<i>MVS/DFP Version 3 Release 2: Utilities</i>	SC26-4559
Service Aids	<i>MVS/ESA System Programming Library: Service Aids</i>	LY28-1844
SMP/E User's Guide	<i>System Modification Program Extended User's Guide</i>	SC28-1302
Special Analysis Techniques	<i>MVS/ESA Diagnosis: Special Analysis Techniques</i>	LY28-1840
System Codes	<i>MVS/ESA Message Library: System Codes</i>	GC28-1815
System Messages	<i>MVS/ESA Message Library: System Messages, Volumes 1 and 2</i>	GC28-1812 GC28-1813

Short Title	Publication Title	Order Number
TSO/E V2 Command Reference	<i>TSO/E Version 2 Command Reference</i>	SC28-1881

Introduction

This publication enables MVS/DFP users to:

- Develop a string of standard symptom keywords describing an MVS/DFP program failure as precisely as possible. **Record the keywords on the "Keyword Worksheet" on page 6 for permanent reference.** (You may wish to make extra copies of the blank worksheet for future use).
- Use the procedure "Searching with the Keyword String" on page 3 to search an IBM software support data base (or contact the IBM Support Center to execute the search using your keyword string) to determine:
 - Whether an APAR already documents the problem
 - Whether a resolution for the problem is available.

You may also contact the IBM Support Center for assistance with:

- Developing a more effective keyword string
- Gathering additional failure-related documentation
- Submitting adequate documentation with an APAR, if required.

You may either use the keywords as a base from which to conduct a search of the *structured data base* (SDB) facility, or to execute a *freeform* search. SDB:

- Prompts you for failure symptoms
- Generates keywords according to a strict protocol
- Initiates the search operation using the SDB.

If you request assistance from the IBM Support Center, and they recommend submitting an APAR, you will need the keyword strings for which you have executed searches.

You may find it useful to refer to the related publication *MVS/DFP: Diagnosis Reference* for additional general and component-specific diagnostic information. *MVS/DFP: Diagnosis Reference* contains the following topics:

"General Diagnostic Aids"

"Asynchronous Operations Manager Diagnostic Aids"

"BDAM Diagnostic Aids"

"CVOL Processor Diagnostic Aids"

"DADSM/CVAF Diagnostic Aids"

"DASD Common Services Diagnostic Aids"

"ISMF Diagnostic Aids"

"Linkage Editor/Loader Diagnostic Aids"

"Media Manager Diagnostic Aids"

"OAM Diagnostic Aids"

"OPEN/CLOSE/EOV (Common) Diagnostic Aids"

"SAM Diagnostic Aids"

"SMS Diagnostic Aids"

"VIO Diagnostic Aids"

"VSAM Diagnostic Aids"

"VSAM—Access Method Services Diagnostic Aids"

"VSAM—Catalog Management Diagnostic Aids"

"VSAM—OPEN/CLOSE/EOV Diagnostic Aids"

"VSAM—Record Management Diagnostic Aids"

What Are Keywords?

A keyword describes one aspect of a program failure. When doing your own software data base search or contacting the IBM Support Center for assistance, you should identify your program failure with as many of the keywords as apply to the problem.

The full keyword string describes the following areas:

- Type-of-failure (always required)
- Module (if applicable)
- Modifier(s)
 - Function (when possible)
 - Subfunction (if applicable)
 - Other significant failure-related modifiers
- Component identification (always required)
- Release level (always required)
- Service level (always required)

Each keyword you add makes the search argument more specific. The more precise the keyword string, the more selective the search, thereby yielding *fewer matches* in the software support data base. If you do not find a similar problem in the data base, you can broaden the scope of the search by deleting keywords, beginning at the end of the string.

Searching with the Keyword String

When you have developed a keyword string describing the MVS/DFP software failure, you are ready to search the IBM software data base, using the keyword string as a search argument.

Each keyword describes one aspect of a program failure. Specifying the component identifier keyword, together with the type-of-failure keyword as a search argument, detects all APARs for that component with that type-of-failure. The more precisely you describe the failure with additional keywords, the more selective the resulting search is, yielding fewer problem descriptions for you to review.

Note: For VSAM catalog-related failures you should construct two keyword strings because a problem could exist in a module that services both types of catalogs. The first string should specify the component ID **566528418** and the second should specify **566528420**.

Software Support Data Bases

Several different software support data base facilities exist for researching software problems.

- **Software Support Facility (SSF)**

SSF is an IBM online data base containing information about all current APARs and PTFs.

IBM Support Center personnel have direct access to SSF and are responsible for using the set of keywords you provide as a search argument. These representatives may help you improve the effectiveness of your search argument. If the problem has been previously reported, they can retrieve the records describing both the problem and the correction.

- **Info/System**

Info/System is an interactive retrieval program product designed for use with the companion data base feature Info/MVS. The data base is divided into several logical files of related or similar information, one of which is IBM's Early Warning System (EWS).

- **Early Warning System (EWS)**

EWS is a microfiche copy of the data contained in SSF. It can help you locate a problem with the same symptoms as yours and determine a correction to the problem. It is organized by component identifier and indexed by APAR system code (for example, OY, OZ, UY, and UZ). EWS is published monthly and is available to IBM program product customers.

Procedure

You will be most successful in searching a software support data base by observing the following rules:

- Use the keywords you have developed as your search argument.
- Spell keywords the same way every time, **exactly** as they are specified in this publication.
- Specify the keywords **only** in the order shown in the following text.
- Include **all** the appropriate keywords in any discussion with IBM. If it becomes necessary to submit an APAR, include the keyword strings used with the APAR documentation you send to IBM.
- Search the software support data base using as many of the following keywords as you have obtained, entering them in the order shown:
 - Type-of-failure
 - Load Module and/or CSECT
 - Modifiers
 - Component identifier
 - Release level
 - Service level
- Scan the resulting list of known similar problems, eliminating APAR fixes already installed on your system.
 - If the list of matching APARs is too long to be practical, contact the IBM Support Center for assistance.

- If you find a matching APAR problem description, contact the IBM Support Center to obtain the fix.
- If you do not find a matching APAR problem description, broaden the search by eliminating keywords from the search argument as directed at "Techniques for Varying the Search Argument."
- If you still do not find a matching APAR problem description, contact the Support Center as directed at "Contacting the IBM Support Center for Assistance" on page 113. They may be able to refine your search argument and find a match in the data base. Otherwise they may direct you to gather additional failure-related information.
- "Preliminary Failure Source Isolation" on page 7 documents the process of building a keyword string.

Techniques for Varying the Search Argument

If, using the initial search argument, you do not find a similar APAR problem description in one of the software data bases, the following suggestions indicate how you may vary the argument to see if you can obtain a match.

- If you have described the failure as either a wait, loop, or performance type-of-failure, replace the type-of-failure keyword with one of the other two keywords. For example, what appears to be a wait state might actually be a loop or a performance problem.
- If more than one type-of-failure keyword applies (for example, an abend and a message both occur), try all combinations of those keywords.
- Delete one keyword at a time in the following order:
 1. Load module name
 2. Service level
 3. Release level
 4. Modifiers
 5. CSECT name

If you now identify a similar problem in the data base, contact the Support Center to obtain the fix.

If you still do not find a matching APAR problem description, contact the Support Center as directed at "Contacting the IBM Support Center for Assistance" on page 113. They may be able to refine your search argument and find a match in the data base. Otherwise they may direct you to gather additional failure-related information.

Keyword Worksheet

DATE: _____ TIME: _____ IBM PROBLEM NUMBER: _____

Problem Description (including symptoms not described by keywords):

IBM Licensed Program Information

PRODUCT NAME: _____ FMID: _____
Modification: _____ Feature: _____ Order Number: _____ PUT Tape Level: _____

Base MVS System Information

NAME: _____ FMID: _____ PUT TAPE LEVEL: _____

Keywords

TYPE-OF-FAILURE: _____ COMPONENT ID: _____

Module Name: _____ Modifiers: _____

Release Level: _____ Service Level: _____

Search Arguments Used:

Information Provided by IBM Support Center

Preliminary Failure Source Isolation

Use this section to isolate the probable source of a failure to an area within MVS/DFP, or to the interfaces with DFDSS or DFHSM. Because you are reading this book, the assumption is that you have performed problem source identification (PSI) and some measure of problem determination (PD), and you suspect that MVS/DFP is related to the failure.

Procedure

1. If the failure involves an MVS/DFP component and ISMF *does not* seem to be involved, go to “Type-of-Failure Keyword” on page 11
2. If the failure seems related to ISMF, use Figure 1 on page 8 to identify the failing function, and continue on page 9.

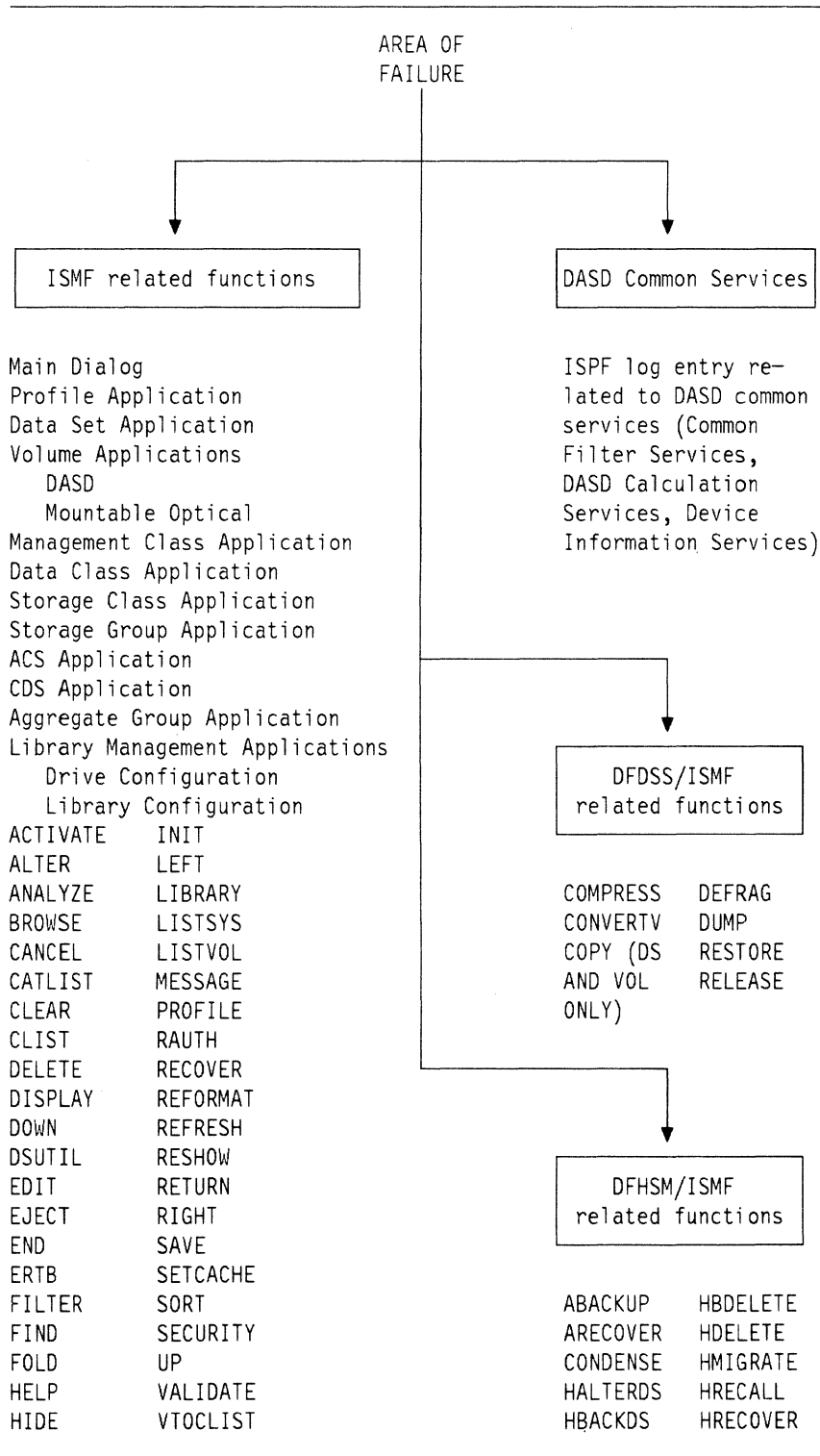


Figure 1. ISMF Failure Isolation Aid

- a. Use this table together with the associated entry in the ISPF log to isolate the failure source. (See the sample ISPF log in "ISMF Diagnostic Aids" of the related publication *MVS/DFP: Diagnosis Reference*.) Locate the SERVICE item in the failure-related log entry. Each SERVICE has its own description for failure-related return codes and reason codes.
- b. If the JCL created by ISMF for a DFDSS function is correct, or if DFHSM is in control, and the failure occurs in either DFDSS or DFHSM, use the publication *DFDSS: Diagnosis* or *DFHSM: Diagnosis Guide* as appropriate.
- c. If the failure involves a reason code associated with one of the DASD common services, use the DASD common services-specific sections of the keyword build procedures and see "DASD Common Services Diagnostic Aids" in the related publication *MVS/DFP: Diagnosis Reference* to gather additional failure-related information.
- d. To begin developing the keyword string, go to "Type-of-Failure Keyword" on page 11.

Type-of-Failure Keyword

The type-of-failure keyword is used to identify an external symptom of a program failure. This keyword is required. Use the following table to determine the type-of-failure keyword that best describes your problem, then proceed as directed to construct that keyword.

Type of Failure	Description	Procedure
Abend	Abnormal termination indicated by: <ul style="list-style-type: none">• A program’s printed system output• A system message’s text• An ISMF abend panel• An ISPF abend panel• A TSO message identifying an abend• A SYS1.LOGREC record.	Turn to “Abend Keyword” on page 13.
Wait/Loop	Program unexpectedly suspended; indicated by: <ul style="list-style-type: none">• No program response.• Repeating messages.• Repeating sequence of ISMF panels.• System abends 122, 222, 322, 522, 722, A22, C22 (See Figure 11 on page 31 for a description of these abends).	Turn to “Wait and Loop Keywords” on page 31.
Message	Error indicated by a system message.	Turn to “Message Keyword” on page 37.
Incorrect Output	<ul style="list-style-type: none">• Incorrect or missing output from a program• Incorrect ISMF panel flow or information	Turn to “Incorrect Output Keyword” on page 50.
Performance	Performance less than what is expected.	Turn to “Performance Keyword” on page 59.
Documentation	Incorrect or incomplete documentation.	Turn to “Documentation Keyword” on page 61.

Abend Keyword

Use this section when your program (or ISMF session) terminates abnormally (abends).

Symptoms of the Failure

You can identify an abend by means of one or more of the following indications:

- A program's printed system output.
- A system message's text.
- An ISMF abend panel.
- An ISPF abend panel.
- A TSO message identifying an abend condition.
- A SYS1.LOGREC record.

The means by which the system indicates an abend condition provides sufficient evidence (message prefix or text, operation performed, module that detected the failure, ISMF abend panel, and so forth) to determine which MVS/DFP component received the ABEND.

A damaged VSAM data set can cause an ABEND0C4 in any of the modules in the following table. Repairing the data set resolves the problem.

IDA019RC	IDA019RE	IDA019RF	IDA019RG
IDA019RH	IDA019RI	IDA019RJ	
IDA019RN	IDA019RW	IDA019R4	

To determine whether you have a damaged data set, use the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publication *MVS/DFP: Access Method Services*, and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors" in the publication *MVS/DFP: Managing VSAM Data Sets*. The EXAMINE command provides details about the nature of data set damage.

Documentation Produced by an ABEND

When an abend is encountered, the system produces one or more of the following kinds of documentation. To determine the **ABEND CODE**, go to the procedure indicated in the following table:

Documentation	Action
ISMF/ISPF abend panel	Turn to "ISMF/ISPF—Abend Panels" on page 15
SVC Dump	Turn to "SVC Dump" on page 18.
SYSABEND, SYSMDUMP, or SYSUDUMP	Turn to "SYSABEND, SYSMDUMP, or SYSUDUMP" on page 23.

For more information on dump documentation and analysis see the publication *Special Analysis Techniques*.

ISMF/ISPF—Abend Panels

Use this section when your program terminates abnormally and ISMF or ISPF seem to be the cause of the failure.

You can recognize an abend failure from one of the following symptoms:

- An ISMF or ISPF abend panel appears on the screen, providing the **ABEND CODE**. Figure 2 below, and Figure 3 on page 16 show sample abend panels. Record the **ABEND CODE** and turn to “Building the Abend Keyword” on page 29.
- A TSO message appears indicating an abend condition. Turn to “TSO Messages for ISMF Abends” on page 16.

```
COMMAND ==> _                                ISMF ABEND PANEL

*****
*****
**
**
**          AN ABEND OCCURRED WHILE EXECUTING ISMF          **
**
**          SYSTEM ABEND CODE:  0C4                          **
**
**          ISMF CANNOT CONTINUE                             **
**
**          PRESS THE ENTER KEY OR USE END TO TERMINATE ISMF **
**          USE HELP TO DISPLAY A LIST OF COMMON ABEND CODES **
**
*****
*****
```

Figure 2. ISMF—Abend Panel

```

-----ERROR RECOVERY-----
COMMAND ==>

* * * * *
* * * * *
* *      ISPF PROCESSOR ENDED ABNORMALLY      * *
* *                                           * *
* *                                           * *
* *      Task ABEND code 0C1                  * *
* *                                           * *
* *                                           * *
* *                                           * *
* *      Press ENTER to display primary option menu. * *
* *      Enter HELP command for list of common ABEND CODES. * *
* *                                           * *
* *                                           * *
* * * * *
* * * * *

```

Figure 3. ISMF—ISPF Abend Panel

TSO Messages for ISMF Abends

When ISMF terminates abnormally and ISPF is in **TEST/TRACE** mode, the system issues a TSO message indicating the failure. **Note:** This is not an ISMF message. See Figure 4 for an example of a TSO message.

Some problems cannot be recreated, so you may not always be able to get a dump or develop a full keyword string describing the problem. You can, however, build the abend keyword by using the symptom dump displayed on your terminal screen and following the instructions in “Building the Abend Keyword” on page 29.

```

* SPF SUBTASK ABEND *
ISPF ENDED DUE TO ERROR+
READY

```

Figure 4. ISMF—TSO Error Message

Procedure

1. The plus sign (+) at the end of the message indicates that additional information is available. If you enter a question mark (?), TSO displays a message describing the error in greater detail.
2. To further diagnose the error, you need a dump of the abend. Press ENTER **when you see the second TSO error message**. If you have WTP message turned on in your TSO profile, the system displays a symptom dump on the terminal screen. (For information about the TSO profile, see *TSO/E V2 Command Reference*.) Figure 5 shows a sample symptom dump.

```
IEA995I SYMPTOM DUMP OUTPUT
ABEND CODE USER = 0222 TIME = 15.29.00 SEQ=22374 CPU = 000 ASID =007B
PSW AT TIME OF ERROR 078D1000 00B5A992 ILC 2 INTC 0D
NO ACTIVE MODULE FOUND
DATA AT PSW 00B5A98C - 00181610 0A0D9180 A0644710
GPR 0-3 80000000 800000DE 0000E060 000184A8
GPR 4-7 000184AC 00018898 00000005 00000005
GPR 8-11 00010B28 0000E810 0000DC30 00B5A788
GPR 12-15 91B59788 000193D0 000185C7 00060000
END OF SYMPTOM DUMP
**LOGICAL SCREEN REQUEST FAILED - ABEND 0000DE**
**CONTACT YOUR SYSTEMS PROGRAMMER OR DIALOG DEVELOPER**
***SPF MAIN TASK ABEND***
ISPF ENDED DUE TO ERROR+
READY
```

Figure 5. ISMF—Displayed System Symptom Dump

If a SYSUDUMP, SYSMDUMP, or SYSABEND data set was allocated before the error, the system directs a full abend dump to the dump data set. You will use the dump later to determine the module keyword.

3. Turn to "Building the Abend Keyword" on page 29.

Note: If you did not have a dump data set allocated before the abend occurred, you can do the following after you build the abend keyword:

- a. Allocate a dump data set using the TSO ALLOC command.
- b. Invoke ISPF with the TEST parameter by issuing the **ISPF TEST** command.
- c. Specify **RECOVER FROM ABENDS = == > N** in your ISMF profile.
- d. Try to recreate the problem by going through your ISMF session again.

SVC Dump

SVC dumps invoked by the SDUMP macro are usually taken as a result of an entry into a *functional recovery routine* (FRR) or ESTAE routine. The *component recovery routine* specifies the addresses that are dumped and directs the dump to one of the SYS1.DUMPXX data sets. The SVC dump contains enough information for you to build the keyword string.

Procedure

For SMS or catalog related abend failures, the system provides a complete SDB failure symptom keyword string in the SUMDUMP under the section "RETAIN SEARCH ARGUMENT." Use this string to describe the failure. See part 1 of Figure 6 on page 19 for a sample of this information.

If the abend code is **X'08B'**, then SMS has experienced a "data in virtual" (DIV) abend. Do the following:

- Obtain the registers from the time of abend, using either the **IGD300I** message or the SDWA.
- Examine the contents of register 15. The two low order bytes contain the DIV reason code related to the abend. Append the reason code to the keyword prefix **RC** and record it on the "Keyword Worksheet" on page 6.

See the description of the applicable DIV reason code listed under abend code 08B in the publication *System Codes*. It may help you define more closely the source of the failure. If it indicates that the problem is external to MVS/DFP, continue the diagnosis process within the component involved.

To determine keywords for SVC dumps, do the following:

1. Use IPCS to print the summary dump (SUMDUMP). (See the publication *Interactive Problem Control System (IPCS) User's Guide*.)
2. The title page of the SUMDUMP (see the example at Figure 6 on page 19) contains the dump header and title page, which provide failure-related symptoms extracted from the dump. (See Figure 7 on page 21 for an explanation of the fields in the header and title page.) One or more of the following symptoms should be present:
 - ABENDnnn
 - Module and/or CSECT name
 - Component Identifier
 - Release Level
 - Service Level
 - FMID

TITLE FROM DUMP: JOB=BUILDCAT,CAS ESTAE-566528418 R310,ABEND0C1,IGG0CLAT+007A
ERRORID FOR THIS DUMP = SEQ00011 CPU00 ASID0006 TIME09.32.23.4

ACTIVE CPU'S AT TIME OF DUMP

ADDR	VERS.	SERIAL	MODEL
0000	FF	022321	3084

***** DUMP ANALYSIS AND ELIMINATION (DAE) *****

THIS DUMP WAS NOT SUPPRESSED BECAUSE
DAE WAS NOT CHECKING FOR PREVIOUS OCCURRENCES.

CRITERIA FOR USE AS A UNIQUE DUMP IDENTIFIER BY DAE:

MINIMUM NUMBER OF SYMPTOMS: 07 FOUND: 09
MINIMUM TOTAL STRING LENGTH: 025 FOUND: 112

SYMPTOMS REQUIRED TO BE PRESENT:

MOD/ CSECT/

SYMPTOMS THAT ARE TO BE USED IF AVAILABLE, BUT ARE NOT REQUIRED:

PIDS/ AB/S AB/U REXN/ FI/ REGS/ HRC1/ SUB1/

MVS SYMPTOM STRING:

MOD/IGG0CLX0 CSECT/IGG0CLAT PIDS/566528418 AB/S00C1 REXN/IGG0CLA9

FI/47F0C0529180B31447E0C042 REGS/0C042 HRC1/C1F900F6 CID1/28418

RETAIN SEARCH ARGUMENT:

RIDS/IGG0CLX0#L RIDS/IGG0CLAT PIDS/566528418 AB/S00C1 RIDS/IGG0CLA9#R

REGS/0C042 PRCS/C1F900F6 VALU/C28418

Figure 6 (Part 1 of 2). Sample SUNDUMP

SYMPTOMS PRESENT FOR USE AS A UNIQUE DUMP IDENTIFIER BY DAE:

MVS KEY	RETAIN KEY	SYMPTOM DATA	EXPLANATION
MOD/	RIDS/	IGG0CLX0	LOAD MODULE NAME
CSECT/	RIDS/	IGG0CLAT	ASSEMBLY MODULE CSECT NAME
PIDS/	PIDS/	566528418	PRODUCT/COMPONENT IDENTIFIER
AB/S	AB/S	S00C1	ABEND CODE-SYSTEM
REXN/	RIDS/	IGG0CLA9	RECOVERY ROUTINE CSECT NAME
FI/	VALU/H	0205B00000BFFF47F0B02A	FAILING INSTRUCTION AREA
REGS/	REGS/	0C042	REG/PSW DIFFERENCE
REGS/	REGS/	0B002	REG/PSW DIFFERENCE
HRC1/	PRCS/	C1F900F6	REASON CODE

ADDITIONAL SYMPTOM DATA NOT USED BY DAE TO IDENTIFY THIS DUMP:

MVS KEY	RETAIN KEY	SYMPTOM DATA	EXPLANATION
VCBM/	FLDS/	CCA	MAPPING MACRO NAME
VCBM/	FLDS/	CCX	MAPPING MACRO NAME
VCBM/	FLDS/	CTGPL	MAPPING MACRO NAME
VCBA/	ADRS/	009E99D0	CONTROL BLOCK ADDRESS
VCBA/	ADRS/	00C42800	CONTROL BLOCK ADDRESS
VCBA/	ADRS/	00970CA0	CONTROL BLOCK ADDRESS
VAID/	VALU/H	000C	CALLERS ASID
VTCB/	ADRS/	009758B8	TCB ADDRESS
VCA/	ADRS/	B00114DC	CALLERS ADDRESS
VCAN/	RIDS/	IGGPGET0	MODULE NAME OF CALLER
VEPN/	RIDS/	IGGPGETR	ENTRY POINT NAME
VETF/	ADRS/	400114EE	ENTRY POINT ADDRESS
CID1/	VALU/C	28418	COMPONENT IDENTIFIER
AMD1/	VALU/C	01/13/86	MODULE ASSEMBLY DATE
VSR1/	VALU/C	UY02458	VERSION-PRODUCT/PTF IDENTIFIER
RRL1/	FLDS/	IGG0CLA9	RECOVERY ROUTINE LABEL
CDB1/	VALU/C	5665	BASE COMPONENT IDENTIFIER
ASID1/	VALU/H	0006	TASK RELATED ASID

Figure 6 (Part 2 of 2). Sample SUNDUMP

Keywords present in sample dump header	
Term	Definition
JOB = BUILD CAT	The jobname of the job requesting catalog services
CAS ESTAE	Indicates that the dump was produced by a CAS ESTAE routine. If the dump was produced by an FRR, this field would be CAS FRR.
566528418 R310	Component ID and release number
ABEND0C1	The dump was taken because of an 0C1 abend
IGG0CLAT + 007A	The abend occurred in CSECT IGG0CLAT at offset X'007A'
	Note: The dump header may contain additional symptoms.
Keywords present in dump title page	
IGG0CLXO	Load module name in which the error occurred
IGG0CLAT	Assembly module CSECT name in which the error occurred
566528419	Component identifier
S00C1	The dump was taken as a result of an 0C1 abend. 0C1 is the ABEND CODE
IGG0CLA9	Recovery routine CSECT name
FI/:	Identifies the instruction string at the failing location
REGS/:	0C042 indicates the failure at offset X'042' from register C (general purpose register 12)
REGS/:	0B002 indicates the failure at offset X'002' from register B (general purpose register 11)
HRC1/:	REASON CODE C1F900F6 indicates catalog error return code of 246(X'F6'), reason code 0 set by IGG0CLA9 (X'C1F9')

Figure 7 (Part 1 of 2). SUMDUMP Header Title Information

Additional keywords present in dump title page	
Term	Definition
VCBM/VCBA:	Identifies names of catalog control blocks (VCBM) and their addresses (VCBA). In this dump, the control blocks and their addresses are: CCA 009E99D0 / CCX 00C42800 / CTGPL 009758B8
VAID/:	The ASID of the caller of CAS (JOB CASANF06)
VTCB/:	The TCB address of the CAS service task processing the catalog request
VCA/:	Address of CALL to failing procedure
VCAN/:	Name of the procedure that called the failing procedure (IGGPGETO)
VEPN/:	Name of the failing procedure (IGGPGETR)
VETF/:	Entry point of failing procedure
CID1/:	Component identifier (last 5 digits of component ID)
VLTF/:	Entry point of load module containing the failing CSECT/Procedure
AMD1/:	Failing module assembly date (01/13/86)
VSR1/:	Service level of failing CSECT (UY02458)
RRL1/:	Recovery routine name
CDB1/:	Base component identifier (first 4 digits of the component ID)
ASID1/:	Task-related address space identifier

Figure 7 (Part 2 of 2). SUMDUMP Header Title Information

3. If you can identify the **ABEND CODE** using the dump header and title page, turn to "Building the Abend Keyword" on page 29.
4. If the dump does not have a header title or otherwise enable you to identify the **ABEND CODE**, use the SUMDUMP printed from the SYS1.DUMPXX data set and continue at "SYSABEND, SYSMDUMP, or SYSUDUMP" on page 23.

SYSABEND, SYSMDUMP, or SYSUDUMP

Depending on the JCL used, the system directs a dump to either the SYSUDUMP, SYSABEND, or SYSMDUMP data set. If the system did not produce a dump, you may have to re-create the failure and obtain one. For information about obtaining a dump, see the publication *Special Analysis Techniques*.

Note: SYSUDUMPs usually do not contain enough information to be useful in diagnosing a failure.

Procedure

1. Obtain a system storage dump that contains the Link Pack Area (LPA), the nucleus, and the user's program.
2. Determine the system abend code by using either:
 - The symptom dump (summary) information in the system job log.

This information includes the abend code, PSW contents, and general purpose register contents. Figure 8 shows the contents of the job log for a job that abended. The abend code is 3 characters long. To obtain the job log, you must specify the JCL parameter **MSGLEVEL=(1,1)** on your JCL JOB card.

```
*****
      J E S 2  J O B  L O G  --  S Y S T E M  P X A 0  --  N O D E  S J F E V M C
----- JOB   14  IEF097I BUILD CAT - USER ----- AND GROUP ----- ASSIGNED
09.18.23 JOB   14  $HASP373 BUILD CAT STARTED - INIT A - CLASS A - SYS PXA0
09.18.23 JOB   14  IEC341I - IGG0CLHB, CATALOG SERVICE TASK ABENDED DURING PROCESSING
09.18.24 JOB   14  IEC342I - IGG0CLHC, ABEND OCCURRED DURING CATALOG PROCESSING
09.18.24 JOB   14  IEA995I SYMPTOM DUMP OUTPUT
      ABEND CODE SYSTEM=0C1 TIME=09.18.23 SEQ=00016 CPU=0040 ASID=000
      PSW AT TIME OF ERROR 070C1000 00D4D550 ILC 4 INT C 11
      NO ACTIVE MODULE FOUND
      DATA AT PSW 00D4D54A - B7185850 B01CBF9F 500C4780
      GPR 0-3 40D48F5C 00C463A8 0002A138 0080000C
      GPR 4-7 00966C00 00966CA0 00C48000 00000011
      GPR 8-11 00C46000 00C48000 00D4E543 009F4E80
      GPR 12-15 50D4D544 00C463B4 50D4928A 00D4D53A
      END OF SYMPTOM DUMP
```

Figure 8. Sample Job Log Output

- The system storage dump.
 - Locate the formatted section at the beginning of the dump. Determine the abending job by locating the job whose abend code field ("TCBCMP" at TCB + X'11') contains a nonzero value. See Figure 9 on page 24 for help in locating the field.
 - The field is only 3 characters long. Ignore the first (left-most) byte. The abend code appears in the first 12 bits following the first byte.
 - The Recovery/Termination Work Area (RTMWA), whose address appears in the TCB's RTWA field in the partial sample dump in Figure 9 on page 24, contains additional information that may be useful in building the keyword string. This includes general register contents, failing module name, and failing PSW address. The dump

also contains a summary of RTMWA contents. See Figure 10 on page 28 for an example of the summary information.

```

DUMP SAMPLE  MODULE IEAVTSDT DATE 06/21/86  TIME 23.23.48  PAGE 00000022

JOB SAMPLE  STEP STEP03  PROCSTEP

TCB  008EBE88
+0000 RBP      008FF430 PIE      00000000 DEB      00000000 TIO      008F8128 CMP      900C1000
+0014 TRN      00000000 MSS      7FF15198 PKF      00          FLGS      01028000 01
+0022 LMP      FF        DSP      FF        LLS      00000000 JLB      00000000 JPK      00000000
+0030 GPR0-3    FFF00000 008EE440 008F9D48 008F9B40
+0040 GPR4-7    008F9D88 008F9DB8 00000004 00001080
+0050 GPR8-11   000803E8 0001939A 00CC67DB 008EE000
+0060 GPR12-15 00CC57DC 008F9FDC 00000000 00000000
+0070 FSA      00008E50 TCB      008EBC30 TME      00000000 JSTCB    008FF970 NTC      008FF0E8
+0084 OTC      008FF970 LTC      00000000 IQE      008EBE50 ECB      00AF4048 TSFLG    20
+0095 STPCT    00        TSLP     00        TSDP     00        RD       7FF1651C AE      00000000
+00A0 STAB     008FF888 TCT      00000000 USER    00000000 NDSP     00002000 MDIDS    00000000
+00B4 JSCB     00AF7920 SSAT    00F883B0 IOBR    00000000 EXCPD   00000000 EXT1     00000000
+00C8 BITS     00000000 DAR      00        RSV37    00        SYSCT    00        STMCT    00
+00D0 EXT2     008EBFE0 AECB     00000000 XSB      008FF498 BACK     009FF618 RTWA     00976600
+00E4 NSSP     00000000 XLAS     00000000 ABCUR    00        RSVAA    00        TID      00
+00EF RSV41     00        XSCT     00000040 FOE      00000000 SWA      00000000 STAWA    00000000
+0100 TCBID    TCB      RTM12    00000000 ESTAE    00000000 UKYSP    7FFFC388 SEQNO    0007
+0112 AFFN     FFFF     FBYT1    08        FBYT2    00        FBYT3    80        RV133    00
+0118 RPT      00000000 VAT      00000000 SWASA    00000000 SVCA2    00000000 ERD      7FF1552C
+012C EAE      00000000 ARC      00000001 GRES     00000000 RS138    00000000 00000000 00000000
+0144          00000000 00000000 LEVEL    03        BDT      00000000 NDAXP    00000000
+0154 SENV     00000000

EXT2  008EBFE0
+0000 GTF      008FF430 RSVAB   00000000 RCMP     00000000 EVENT    008F8128 RTMCT    00000000
+0010 TQE      00000000 CAUF     7FF15198 PERCP    00        PERCT    01028000 01
    
```

Figure 9 (Part 1 of 4). Sample System Storage Dump

ACTIVE RBS										
PRB	008EBDC8									
-020	XSB	008EBE30	FLAGS2	00000000	RTPSW1	070C0000	0001939A		RTPSW2	00020001
-00C		008CD000	FLAGS1	02000000	WCSA	00	INLNTH	02	INTCODE	0001
+000	RSV	00000000	00000000		SZSTAB	00110082	FLDCE	008FD208		
+010	OPSW	070C0000	0001939A		SQE	00000000	LINK	008EBE88		
+020	GPR0-3	00000004	00000000	008FF0E8	00F73770					
+030	GPR4-7	00AF4048	0000A61E	00AF6050	00000005					
+040	GPR8-11	00AF4000	00000000	0000A8C7	008EE000					
+050	GPR12-15	000098C8	00008E50	00AF41A4	00AF4188					
+060	RSV	C9C7C7D7	C1C3C4E5							
XSB	008EBE30									
+000	XSB	XSB	LINK	00000000	KM	8000	SASID	0006	AX	0001
+00E	PASID	0006	XLIDR	00000000	XLAS	00000000	TKN	0000	ASD	0000
+01C	SEL	00000000								
SVRB	008FD338									
-020	XSB	008FD408	FLAGS2	00000000	RTPSW1	00000000	00000000		RTPSW2	00000000
-00C		00000000	FLAGS1	20000000	WCSA	00	INLNTH	02	INTCODE	000C
+000	RSV	00000000	00000000		SZSTAB	001ED022	FLDCE	00000000		
+010	OPSW	070C0000	0001939A		Q	00000000	LINK	008EBDC8		
+020	GPR0-3	008C9C80	00000000	00000003	00000040					
+030	GPR4-7	008ECEC8	008C9C80	008C9C80	008C9C80					
+040	GPR8-11	008C9C80	0001B356	0001A357	008EE000					
+050	GPR12-15	40019358	008EE440	4000B296	00000000					
+060	EXSAVE	008C9C80	00000000	00F88590	008EBE88	008FD338	00F5DE00	00FE3000	00F7886C	008FA600
+084		FF0009FC	40000101	900C1000	SCBB	00000000	00000000	00000000	838FD338	6400D800
+0A4	SXPTR	008FD3F8	FEPARM	00000000	81AAE828	00000000	00000084	00FE3000	00000000	
+0C0	SCBX	00000000	00000000	00000000	008FD338					
XSB	008FD408									
+000	XSB	XSB	LINK	00000000	KM	0000	SASID	0006	AX	0001
+00E	PASID	0006	XLIDR	00000000	XLAS	00000000	TKN	0000	ASD	0000
+01C	SEL	00000000								
PRB	008FF430									
-020	XSB	008FF498	FLAGS2	00000000	RTPSW1	00000000	0001939A		RTPSW2	00020001
-00C		00000000	FLAGS1	00000000	WCSA	00	INLNTH	02	INTCODE	0001
+000	RSV	00000000	00000000		SZSTAB	00110002	FLDCE	008FD208		
+010	OPSW	070C0000	00CC62DA		SQE	00000000	LINK	008EBE88		
+020	GPR0-3	00052916	008F9B40	00000000	008FA600					

Figure 9 (Part 2 of 4). Sample System Storage Dump

+030	GPR4-7	00000000	008FFF88	00000008	008F9B40					
+040	GPR8-11	00000000	01AB4A81	81AB3A82	008FFFA0					
+050	GPR12-15	00000000	008F9FB8	008FA620	01AB4A11					
+060	RSV	00000000	00000000							
XSB	008FF498									
+000	XSB	XSB	LINK	00000000	KM	8000	SASID	0006	AX	0001
+00E	PASID	0006	XLIDR	00000000	XLAS	00000000	TKN	0000	ASD	0000
+01C	SEL	00000000								
LOAD LIST										
NO ELEMENTS ON LOAD LIST										
JOB PACK QUEUE										
CDE	008FD238									
+000	CHAIN	008FD208	RRBP	00000000	NAME	IGGOCLX0	ENTPT	000098C8	XLMJP	008FD228
+018	USE	000B	ATTRB	00	SP	FC	ATTR	39	ATTR2	23
+01E	ATTR3	0000								
CDE	008FD208									
+000	CHAIN	00000000	RRBP	00000000	NAME	IGGPACDV	ENTPT	00009CE2	XLMJP	008FD238
+018	USE	0000	ATTRB	00	SP	00	ATTR	35	ATTR2	03
+01E	ATTR3	0000								
TIOT	008F8128									
TASK HAS NO OPEN DATA SETS										
RTM2WA	008FA600									
+000	ID	RTM2	ADDR	008FA600	SPID	FF	LGTH	0009FC	CVT	00F88590
+010	TCBC	008EBE88	VRBC	008FD338	ASC	00F5DE00	CCF	008EBDC8	CC	0C1000
+020	SFWA	83C00001	008FFFA0	00000000	00000000		TCBT	008EBE88	VRBT	008FD338
+038	CT	00F48408	ER0	008C9C80	ER1	00000000	ER2	00000003	ER3	00000040
+04C	ER4	008ECEC8	ER5	008C9C80	ER6	008C9C80	ER7	008C9C80	ER8	008C9C80
+060	ER9	0001B356	ER10	0001A357	ER11	008EE000	ER12	40019358	ER13	008EE440
+074	ER14	4000B296	ER15	00000000	EPSW	070C0000	0001939A		RSV	00
+085	ILC1	02	INC1	0001	TRAN	008CD000	ABNM	C7C7C7D7	C1C3C4E5	
+094	ABEP	00009CE2	SCKB	00000000	SCKE	00000000	MCHS	0000	MCHD	00
+0A2	CPID	0000	RSR1	00	RSR2	00	RSV	0000	RFSA	00000000

Figure 9 (Part 3 of 4). Sample System Storage Dump

+0AC	TIME	00000000	00000000	ERRA	40	ERRB	04	ERRC	00	
+0B7	ERRD	01	FMID	0000	I0FS	20	RSV	00	RSV	00
+0BD	FIOB	FFFFFF	RBST	008EBDC8	RSV	00000000	SCBC	008FFF88	SCBN	008FFF88
+0D0	SCB0	00000000	SDW1	008F9B40	SUBP	E6	SIZE	0004C0	COMP	00000000
+0E0	RTYA	00000000	RYRB	00000000	RCDE	00	RSV	000000	CMKA	FF
+0ED	MWPA	04	INTA	0001	PMKA	40	NXTA	01939A	CMKP	FF
+0F5	MWPP	04	INTP	0001	PMKP	40	NXTP	01939A	DPLA	00000000
+100	SNPL	00000000	00000000	00000000	00000000		SPSL	008FAA1C	HLST	00000000
+118	SPSP	008FAB0C	SRSV	00000000	00000000	00000000	00000000	00000000	00000000	
+134	DD	00000000	00000000	SNCC	00000000	DTCB	00000000	ECBA	008FA754	
+148		008FA758	008FA75C	008FA760	ECBS	00000000	00000000	00000000	00000000	
+164	DCBA	00000000	ANCH	008FA600	PREV	00000000	PRWA	00000000	SFSA	00000000
+178		00000000	7FFFD9F8	81AB5702	81AB3A60	D9E3F104	008FA600	00000000	01AB62C1	008EBE88
+19C		008FD338	81AB52C2	008FFF88	008FA600	01AB572C	00000000	00FE3890	008FD398	
+1BC	PKEY	00	CCTL	0800	CTLR	00	MCTL	00	ABID	00
+1C2	ABND	00	RCTL	18	CTLR	00	D MPC	00	TSKT	00
+1C7	MENT	00	ABDP	00	ASIR	00	FLX1	00	FLX2	00
+1CC	SCTC	00200000	SCTR	00000000	SCTX	00000000	DCTL	00	ECTL	00
+1DA	TMER	0000	TRF1	0028	TRF2	00	TRF3	00	TRRA	01AB4828
+1E4	SKRA	01AB572C	STRA	01AB68F2	CTRA	01AB82F0	RECT	0000	WARG	04
+1F3	RBRG	00	RREG	00000008	008F9B40	00000000	008FA600	008EBE88	008FFF88	000000C0
+210		008F9B40	00000100	01AB4A81	81AB3A82	008F9F40	008EBDC5	008F9FB8	008FAF3C	00000000
+234	CREG	00000000	00000000	00000000	81AB7E82	81AB52A0	D9E3F104	008FA974	00FED728	01AB80B1
+258		008EBE88	008FD338	81AB70B2	008FD398	008FA600	00F5DE00	00000000	00FE3890	00FE3890
+27C	TRSA	02000000	008FA8E0	008FA600	00000000	00000000	00000000	00000000	00000000	00000000
+2A0		000C1000	00000000	00000C10	00000000	00000000	00000000	00000000	00000000	00000000
+2C4	RMPS	008FABC8	RMPL	80000006	00F5DE00	00000000	00000000	008FA8E0	00000000	
+2E0	RMWS	43000000	7F8EBE88	008FA6BC	08000000	00000000	00000000	00000000	00000000	00000000
+304		00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
+324		00000200	00000000	008FD358	008EBDC8	00000000	00000000	00F48408	01AB80B1	008EBE88
+348		008FD338	81AB70B2	008FD398	008FA600	00000000	00000000	008FA968	00F7886C	
+368	SEQ#	1174	CPU1	0000	ERAS	0006	ERTM	00041B76	RSV	0000
+374	TRSN	008FAB1C	EXCL	00000000	00000000		SNPH	0000	RSV	0000
+284	RSV	00000000	RYRS	00000000	00000000	00000000	00000000	00000000	00000000	00000000
+3A4		00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
+3C8	TECB	00000000	KM	8000	SASD	0006	AX	0001	PASD	0006
+3D4	COMU	00000000	00000000		SDW2	008FAB3C	CRC	00000000	RSV	00000000
+3E8	RSV	00000000	RSV	00000000	RSV	00000000	RSV	00000000	MCIC	00000000
+3FC		00000000	FAIN	47F0C052	9180B314	47E0C04C	ASCB	00F5DE00	ASST	000D407F
+414	OABF	00	OCMP	000000	OCRC	00000000				

Figure 9 (Part 4 of 4). Sample System Storage Dump

```

RTM2WA SUMMARY
-----
+1C  COMPLETION CODE          840C1000
+8C  ABENDING PROGRAM NAME    IGGPACDV
+94  ABENDING PROGRAM ADDR    00008A56

+3C  REGS AT TIME OF ERROR    00F8BC00 00C495A0 0008E4E0 0008BCF8 00C4CE88 0008D198 00000000 0008D198 (0-7)
+5C                                     819C0334 00C480D0 019C1001 819C18DA 0008B7D0 009E9E70 819C04E4 819C18D8 (8-F)
+7C  EC PSW AT TIME OF ERROR  070C0000 819C18DC 00020001 00944000
+DC  SDWACOMP                  00000000

+E8  RETURN CODE FROM RECOVERY ROUTINE-00,CONTINUE WITH TERMINATION-IMPLIES PERCOLATION
+E0  RETRY ADDR RETURNED FROM RECOVERY EXIT 00000000
+E4  RB ADDR FOR RETRY          00000000

+C   CVT  ADDR                 00FB6A40
+38  RTCT ADDR                 00F76408
+C8  SCB  ADDR                 009FF0D8
+D4  SDWA ADDR                 0096FB40
+14  SVRB ADDR                 009FD338
+16C PREV RTM2WA FOR THE TASK  00000000
+170 PREV RTM2WA FOR RECURSION 00000000

+B8  ASID OF ERROR IF CROSS MEMORY ABTERM      0000
+36C ERROR ASID                  0006

RTM2WA BIT FLAG SUMMARY
    
```

Figure 10. Sample R/TM Work Area Summary

- When you determine the **ABEND CODE**, continue at "Building the Abend Keyword" on page 29.

Building the Abend Keyword

To build the abend keyword do the following:

1. Use the **ABEND CODE** that you have extracted from the system-produced documentation.

System abends are expressed in hexadecimal; user abends are expressed in decimal.

- For a system abend, append the 3-character code to the keyword prefix **ABEND**.

Example: If the abend code is **0C4**, specify the abend type-of-failure keyword as shown:

```
ABEND0C4
```

- For a user abend, append the 4-digit code to the keyword prefix **ABENDU**.

Example: If the abend code is **0222**, specify the abend type-of-failure keyword as shown:

```
ABENDU0222
```

2. If a message containing a return code accompanies the abend, include the return code in your keyword string as a modifier keyword. Append the code (*specified exactly as it appears in the message*) to the keyword prefix **RC**.

Example: If the return code is **04**, specify the keyword string as shown:

```
ABEND0C4 RC04
```

3. Turn to "Module Keyword" on page 63 (directly to the component-specific section, if one exists).

Wait and Loop Keywords

Use this section when an MVS/DFP function appears to be waiting or looping.

Symptoms of the Failure

You can identify a wait or loop condition by means of one of the following conditions:

- Suspended activity while waiting for some condition to be satisfied.
- Endless instruction loop.
- Repeating message(s).
- Repeating sequence of ISMF panels.
- No system response; for example, an ISMF panel remains on the terminal screen indefinitely after the operator has taken action that should cause it to change.
- System abends 122, 222, 322, 522, 722, A22, C22 (see Figure 11 for a description of these abends).

Figure 11. System Abends for WAITs and LOOPs

Symptom	Description
Abend 122	The job (or ISMF session) was canceled by the operator (with a dump). This could be caused by a normal or abnormal LOOP, by a large request that took too much time, or by the unavailability of a resource.
Abend 222	The job (or ISMF session) was canceled by the operator. This could be caused by a normal or abnormal LOOP, by a large request that took too much time, or by the unavailability of a resource.
Abend 322	The job (or ISMF session) timed out. It took longer than the time specified in the TIME parameter of the EXEC or JOB statement, or the standard time limit specified in the job entry subsystem.
Abend 522	The job (or ISMF session) timed out because of a normal or abnormal WAIT state.
Abend 722	The system output limit was exceeded. This could be corrected by increasing the value on the OUTLIM parameter of the DD statement. This might also be caused by a LOOP.
Abend A22	The job (or ISMF session) was canceled by the operator. The problem might have been caused by a LOOP, a WAIT, or an ENQUEUE/DEQUEUE problem.
Abend C22	Too many EXCPs (execute channel programs) occurred. This might be caused by a LOOP.

Because wait and loop failures are often hard to differentiate, this section documents both keywords.

Procedure

1. The failure indications should enable you to establish whether ISMF is involved or not. If you suspect a failure in ISMF, turn to "ISMF—Wait and Loop Keywords" on page 33.
2. For all other MVS/DFP components, obtain the following:
 - A dynamic dump invoked by the operator from the master console (contains the nucleus and LPA).
 - Maps of the nucleus and LPA (required with any dump). Obtain these maps by executing the **PRDMP NUCMAP** and **LPAMAP** commands, or by the **AMBLIST LISTLPA** and **LISTLOAD OUTPUT=XREF, MEMBER=IEANUC01** commands. See Chapter 2, "LIST," in the publication *Service Aids*).
3. Using the sample formatted dump shown in Figure 9 on page 24, scan the RBs to see if a WAIT SVC was issued. The INTCODE field of the RB contains 0001 for jobs that issued a WAIT SVC.

Additionally, the high order byte of the LINK field of the RB may contain 01XXXXXX, indicating the number of events being waited on.

4. If these fields do not indicate a WAIT condition, assume that the failure is a LOOP.
5. In either case, record the current PSW address in the waiting or looping RB's OPSW field as the failing address. You will use it to determine the failing module.

Example: Specify either the WAIT or LOOP keyword as shown:

WAIT

-or-

LOOP

You may find the following information useful in isolating the source of a LOOP failure to a specific module:

- A system branch trace (invoked by the operator from the console). This makes an entry in the system trace table for every successful branch instruction. (See the publication *Special Analysis Techniques* for the format of the system trace table.)
 - An AMBLIST listing or SPZAP dump of the CSECT(s) that you suspect (see the publication *Service Aids*).
6. A wait on the ENQ/DEQ major resource names **IGDCDS**, **IGDCDSXS**, or **SYSZIGDI**, indicates that the Storage Management Subsystem (SMS) is involved in the failure. Record the indicated major resource name as a modifier keyword on the "Keyword Worksheet" on page 6. If the minor resource name is unique (was not created by the system at job execution time), record it on the Keyword Worksheet too.
 7. For VSAM Record Management/Block Processor, turn to "VSAM Record Management/Block Processor—Wait and Loop Keywords" on page 35.
 8. For all other MVS/DFP components, turn to "Module Keyword" on page 63.

ISMF—Wait and Loop Keywords

Use this section when either a wait or loop condition seems to be occurring and you suspect ISMF of causing a failure.

If a request from a selection panel seems to be taking an abnormally long time to process, it could be related to legitimate selection criteria you have specified. Because the entries in the list generated must meet all of the criteria you establish on the selection panels, each value you specify must be verified before the list can be generated. To speed up processing you can try the following:

- Limit the number of entries in the list by making your selection criteria more specific.
- For data set selection, the time it takes to build a list is affected by the number of times ISMF must access the catalog or VTOC. If you are generating the list from the catalog:
 - Do not acquire data for data sets migrated by DFHSM.
 - Do not acquire data from the volume.
- For volume selection:
 - Be aware that processing 3330V volumes requires considerably more time than non-3330V volumes.

Procedure

1. If you have made the distinction between a WAIT or LOOP, identifying the failure as either one or the other, specify the type-of-failure keyword as shown below and turn to "ISMF—Modifier Keywords" on page 91. Otherwise, continue at 2.

WAIT

-or-

LOOP

2. If you know the failure is either a wait or a loop, but cannot determine which, you need a dump to diagnose the problem. If the system has not produced a dump, see "Determining How ISMF handles Dumps" in the related publication *MVS/DFP: Diagnosis Reference*. If you have a dump, continue here.
3. Find the Program Status Word (PSW) in the dump (see Figure 12 on page 34).


```

JOB USER20          STEP IEFPROC      TIME 143854  DATE 87091   ID = 000   CPUID = FF0212543084  PAGE 00000001
COMPLETION CODE    USER = 0122
PSW AT ENTRY TO ABEND 078D1000 80023534      ILC 2  INTC 000D
PSW ADDRESS 00023534 AT TIME OF ERROR DOES NOT POINT TO AN ACTIVE MODULE

ASCB  00F77D80
+0000 ASCB  ASCB  FWDP  00F62780 BWP  00F63B80 CMSF  00000000 SVRB  007FD540
+0014 SYNC  00007BD5 IOSP  00000000 TNEW  007BB318 CPUS  00000001 ASID  000B
+0026 SEQN  0007  LL5  00  RV01  00  HLHI  01  DP  3D
+002C RV00  00000000 LDA  7FF144E8 RSMF  00  RV81  000000  CSCB  00F77CC8
+003C TSB  00AAD188 EJST  00000036 40F84A00 EWST  9A562011 BE215E40
+0050 JSTL  000141DD ECB  807FDAD8 UBET  9A561FE9 TLCH  00000000 DUMP  007FD080
+0064 AFFN  FFFF  RCTF  01  FLG1  00  THCH  00000000 ASXB  007FDC20
+0070 SWCT  6667  DSP1  00  FLG2  00  RSV  0000  SRBS  0000
+0078 VSC  0000  NVSC  018E  RCTP  007FDE40 LOCK  00000000 LSQH  00000000
+0088 QECB  00000000 MECB  40000000 OUCB  0194EF08 OUXB  01138928 FMCT  008E
+009A LEVL  02  RV02  00  XMPQ  00000000 IQEA  00000000 RTMC  00000000
+00A8 MCC  00000000 JBNI  00000000 JBNS  00F77C00 SRQ1  00  SRQ2  00
+00B6 SRQ3  00  SRQ4  00  VGT  00000000 PCTT  00000000 SSRB  0000
+00C2 SMCT  00  SRBM  07  SWTL  0000023C SRBT  00000006 40D3CC00
+00D0 LSMQ  00000000 LSPL  00000000 TCBS  00000001 TCBL  00000000 WPRB  007FEB00
+00E4 NDP  3D  TNDP  FF  NTSG  FF  IODP  3D  LOCI  00000000
+00EC CMLH  00000000 CMLC  00000000 SS01  000000  SS04  00  ASTE  00F5E0B0
+00FC LTOV  7FFFD000 ATOV  7FFFE750 ETC  0000  ETCN  0000  LXR  0000
+010A AXR  0000  STKH  007FEB10 GQEL  00000000 LQEL  00202990 GSYN  00000000
+011C XTCB  007FF800 CS1  00  RV58  000000  GXL  00000000
+0128 EATT  00000000 604C5000 INTS  9A560F23 A8898E00 LL1  00
+0139 LL2  00  LL3  00  LL4  00  RCMS  00000000 IOSC  00003933
+0144 PKML  0080  XCNT  01F4  NSQA  00000000 ASM  0193AE00 RV30  00000000
+0154 TCME  00000000 RV70  00000000 00000000 00000000 00000000 CREQ  0000006B
+016C RSME  0193AEC0 RV86  00000000 ARC  00000000 RSMA  0193AE08 DCTI  0006F626
+0180 TAXT  00000000 00000000 SAXT  00000000 00000000
+0190 TCPT  00000036 42CEFC00 SCPT  00000006 40EFBE00

```

Figure 12. ISMF—Locating the PSW in an ISMF Dump

- Determine whether the WAIT bit (bit 14) of the PSW is on or off. For example, in Figure 12, the PSW is 078D1000 80023534. The hexadecimal digit D is bits 12 through 15. Expressed in bits, this is 1101. Bit 14 (the wait state bit) is off. If Bit 14 is off, specify the type-of-failure keyword as shown:

LOOP

- If Bit 14 is on, specify the type-of-failure keyword as shown in the following example:

WAIT

- Turn to "ISMF—Modifier Keywords" on page 91.

VSAM—Wait and Loop Keywords

VSAM Record Management/Block Processor—Wait and Loop Keywords

Use this section to determine whether additional analysis is required when either a wait or loop condition occurs and you suspect the VSAM Record Management/Block Processor component of causing the failure.

Procedure

1. Some wait/loop failures involve reading or writing data to a damaged VSAM data set. To determine whether you have a damaged data set, use the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publication *MVS/DFP: Access Method Services* and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors" in the publication *MVS/DFP: Managing VSAM Data Sets*. The EXAMINE command provides details about the nature of data set damage.

Waits or loops can occur in several VSAM modules because of a damaged VSAM data set. The most commonly involved modules are:

IDA019RA	IDA019RH	IDA019RW
IDA019RB	IDA019RI	IDA019R2
IDA019RC	IDA019RJ	IDAM19R3 (IDA019R3)
IDA019RE	IDA019RN	

A loop might also be indicated by the reissuing of either SVC121 (X'79') or Start I/O (SIO). If an apparent wait occurs and a console dump is taken, either of the following symptoms might indicate the involvement of a damaged data set:

- SVC01 WAITs issued by module IDA019RZ
2. Turn to "Module Keyword" on page 63.

Message Keyword

Use this section for all MVS/DFP message-related problems.

Symptoms of the Failure

You can identify a message type-of-failure when one of the following conditions occurs:

- Message reports program or operation failure
- Message is missing data, or contains invalid data
- Message reports a data failure (catalog, user data)
- No message when one should have been issued

Procedure

Before using this section, examine the publications *System Messages* and *System Codes*. These may help you generate additional keywords by identifying failure-related functions and providing message-to-module cross-reference tables.

Definition of Message Keyword Related Terms

The component-specific message keyword sections use the terms defined in the following table:

Figure 13. Definition of Message Keyword Related Terms

Term	Definition
Message identifier	A three-letter prefix to identify the component that produced the message and a message serial number to identify the individual message (for example, IDC0746I).
Message keyword prefix	The characters MSG , to which the message identifier is appended. This comprises the message type-of-failure keyword.
Return or reason code	A numeric code contained in the message text. Either the message text or the publication <i>System Messages</i> identifies the type of code.
Return or reason code keyword prefix	The characters RC , to which each return or reason code (exactly as it appears in the message) is appended. (Each code in the text requires its own keyword prefix.) This comprises a modifier keyword to specify the failure-related symptom.

Go to one of the procedures indicated in the following table:

Component	Procedure
DADSM/CVAF	Turn to "DADSM/CVAF—Message Keyword" on page 39.
ISMF	Turn to "ISMF—Message Keyword" on page 42.
SMS	Turn to "SMS—Message Keyword" on page 46.
VSAM Record Management	Turn to "VSAM Record Management—Message Keyword" on page 49.
All other MVS/DFP components	Continue below.

1. Append the message identifier to the keyword prefix **MSG**. Include in the keyword string any return codes and reason codes from the message text. Append the codes, *exactly as they appear in the message* to the keyword prefix **RC**.

Example: If the message identifier is **IDC0746I**, the return code is **04**, and the reason code is **032**, specify the keyword string as shown:

```
MSGIDC0746I RC04 RC032
```

2. Message text may contain additional information that you can use as modifier keywords (function, subfunction, device-related information, and so forth); record it on the "Keyword Worksheet" on page 6.
3. Input/Output or hardware-related errors—Review SYS1.LOGREC for keyword information.
4. Turn to "Module Keyword" on page 63.

DADSM/CVAF—Message Keyword

Use this section when a message indicates a failure in DADSM/CVAF.

Procedure

Before using this section, examine the publications *System Messages* and *System Codes*. These may help you generate additional keywords by identifying failure-related functions and providing message-to-module cross-reference tables.

See "Definition of Message Keyword Related Terms" on page 37 for definitions of the following terms used in this section:

- Message identifier
- Message keyword prefix
- Return or reason code
- Return or reason code keyword prefix

Messages Issued by DADSM/CVAF

If DADSM issues message **IEC614I**, append the message identifier and function return code to their appropriate prefixes. Append the 4-byte diagnostic information field to the prefix **DI** and record on the "Keyword Worksheet" on page 6 all failure-related function modifier keywords.

Example: If the message is as follows,

```
IEC614I RENAME FAILED - RC 004, DIAGNOSTIC INFORMATION IS 040D002D
```

specify the keyword string as shown:

```
MSGIEC614I RENAME RC004 DI040D002D
```

System dumps accompany the following DADSM/CVAF messages:

- IEC603I (under some circumstances)
- IEC606I
- IEC608I
- IEC609I

IEC603I—DADSM issues this message.

1. Append the message identifier to the keyword prefix **MSG** and record it on the "Keyword Worksheet" on page 6 as the type-of-failure keyword. Append the *cde* code to the keyword prefix **RC** and record it on the "Keyword Worksheet" on page 6 as a modifier keyword.

Example: If the *cde* field contains **04**, specify the keyword string as shown:

```
MSGIEC603I RC04
```

2. If a dump entitled **DADSM (OBTAIN, SCRATCH, ALLOCATE, OR EXTEND) ERROR** is taken, then DADSM caused the dump because of an unexpected CVAF error. Continue below, using "CVAF—Dumps" in the related publication *MVS/DFP: Diagnosis Reference* for CVAF dump analysis assistance.

- Record either the DADSM function name from the dump title (for example, OBTAIN) or the 2-character code for the CVAF function last issued (and the 2-character subfunction code, if applicable), as indicated by the 1-byte CVFCTN field (offset X'06' in the CVPL) as a modifier keyword. The CVPL is in the DADSM work area. See Figure 26 on page 88 for a list of valid CVFCTN field values.

Example: If the CVFCTN field contains X'07', record the modifier keywords as shown:

```
IX DEL
```

- Turn to "DADSM/CVAF—Module Keyword" on page 64.

IEC606I—CVAF issues this message. It is related to CVAF ABEND18B.

- Append the message identifier to the keyword prefix **MSG** and record it on the "Keyword Worksheet" on page 6 as the type-of-failure keyword. Append the *cde* code to the keyword prefix **RC** and record it on the "Keyword Worksheet" on page 6 as a modifier keyword.

Example: If the *cde* field contains **153**, specify the keyword string as shown:

```
MSGIEC606I RC153
```

- If the message type-of-failure keyword (without the abend keyword) is inconclusive, execute software data base searches using:
 - Both **ABEND18B** and MSGIEC606I together as type-of-failure keywords
 - ABEND18B** alone as the type-of-failure keyword
- Record the CVAF module name identified in the system dump title on the "Keyword Worksheet" on page 6.
- Turn to "DADSM/CVAF—Module Keyword" on page 64.

If the system issues a dump titled "DADSM (OBTAIN, SCRATCH, ALLOC, EXTEND) ERROR," DADSM module IGG032DB caused the system dump. Continue here using "DADSM/CVAF System Dumps" in the related publication *MVS/DFP: Diagnosis Reference* for CVAF dump analysis assistance. Otherwise, turn to "DADSM/CVAF—Module Keyword" on page 64.

- Specify either the DADSM function (from dump title) or the CVAF function last issued, as indicated in the 1-byte CVFCTN field (offset 6 in the CVPL) as a modifier keyword. The CVPL is in the DADSM work area. Locate the **CVPL** eyecatcher by scanning the readable portion of the DADSM work area. (See the table at Step 1k on page 88 for valid CVFCTN values.) Specify the IEC603I message as the type-of-failure keyword, and extract the *cde* field value from the message text.

Example: Append the message identifier and *cde* field (given a value of 4 in this example) to their respective keyword prefixes as shown:

```
MSGIEC603I RC4
```

- Turn to "DADSM/CVAF—Module Keyword" on page 64.

IEC608I or **IEC609I**—If **DADSM** issued either message and disabled the VTOC index, **CVAF** issues message IEC606I, error code 153, and causes a system dump.

1. **IEC608I**—Use the explanation of the message's *cde* field and the message-to-module cross-reference table in the publication *System Messages* to determine the related module and function. If available, append these symptoms to their respective prefixes and record them on the "Keyword Worksheet" on page 6.
2. **IEC609I**—Append the single digit function code from the message text to the prefix **IGGVRF0** to determine the related module name. Append the message identifier and the message's *cde* field to their respective identifiers and record these keywords and the function keyword (identified by the value in the message's *fcn* field) on the "Keyword Worksheet" on page 6.

Example: Append the symptoms to their respective keyword prefixes as shown:

MSGIEC608I SCRATCH RC12

or

MSGIEC609I IGGVRF01 ALLOCATE RC4

3. Turn to "DADSM/CVAF—Module Keyword" on page 64.

ISMF—Message Keyword

Procedure

Before using this section, examine the publications *System Messages* and *System Codes*. These may help you generate additional keywords by identifying failure-related functions and providing message-to-module cross-reference tables.

See “Definition of Message Keyword Related Terms” on page 37 for definitions of the following terms used in this section:

- Message identifier
- Message keyword prefix
- Return or reason code
- Return or reason code keyword prefix

Identifying the Error Message Source

The following two types of error messages can occur when running ISMF:

- **Error messages issued by other components that interrupt the screen.** See Figure 14 for an example of a TSO message that can interrupt the screen. See “Messages Issued by Other Components” on page 44 to diagnose the error.

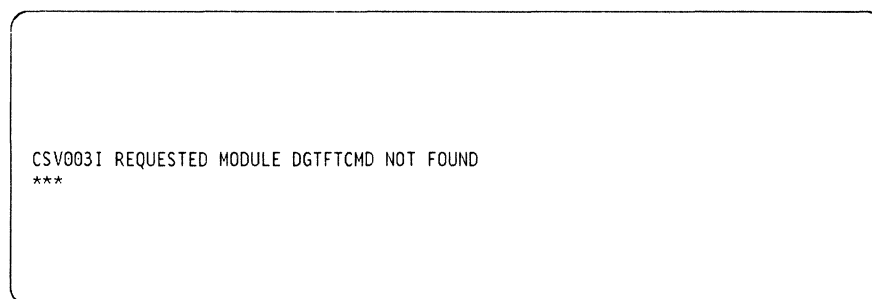


Figure 14. ISMF—Messages That Interrupt the Screen

- **ISMF or ISPF short error messages.** Figure 15 on page 43 is an example of an end user ISMF panel with the short message:

```
DFHSM LEVEL UNKNOWN
```

ISPF short error messages have the same format. To determine whether ISMF or ISPF issued the error message, turn to “Identifying an ISMF Error Message” on page 43.

```
DGTSMMDD1          ISMF PRIMARY OPTION MENU          DFHSM LEVEL UNKNOWN
ENTER SELECTION OR COMMAND ==>>

SELECT ONE OF THE FOLLOWING:

 0 ISMF PROFILE      - Change ISMF user profile
 1 DATA SET         - Perform Functions Against Data Sets
 2 VOLUME            - Perform Functions Against Volumes
 3 MANAGEMENT CLASS - Specify Data Set Backup and Migration Criteria
 4 DATA CLASS       - Specify Data Set Allocation Parameters
 5 STORAGE CLASS     - Specify Data Set Performance and Availability
 X EXIT              - Terminate ISMF

USE HELP COMMAND FOR HELP; USE END COMMAND TO TERMINATE ISMF.
```

Figure 15. ISMF—End User Short Error Message

Identifying an ISMF Error Message

1. To determine whether ISMF or ISPF issued the error message, press the HELP key or enter the HELP command. The system displays a long message related to the original short error message. Figure 16 is an example of an end user ISMF panel with the long error message:

DFHSM LINE OPERATORS MAY FAIL - DFHSM V2 R2.1 OR LATER NEEDED

ISPF long messages have the same format.

```
DGTSMMDD1          ISMF PRIMARY OPTION MENU          DFHSM LEVEL UNKNOWN
ENTER SELECTION OR COMMAND ==>>
DFHSM LINE OPERATORS MAY FAIL - DFHSM V2 R2.1 OR LATER NEEDED
SELECT ONE OF THE FOLLOWING:

 0 ISMF PROFILE      - Change ISMF user profile
 1 DATA SET         - Perform Functions Against Data Sets
 2 VOLUME            - Perform Functions Against Volumes
 3 MANAGEMENT CLASS - Specify Data Set Backup and Migration Criteria
 4 DATA CLASS       - Specify Data Set Allocation Parameters
 5 STORAGE CLASS     - Specify Data Set Performance and Availability
 X EXIT              - Terminate ISMF

USE HELP COMMAND FOR HELP; USE END COMMAND TO TERMINATE ISMF.
```

Figure 16. ISMF—End User Long Error Message

2. Press the HELP key again to see the help panel for the short and long messages. The help panel further explains the problem. Figure 17 is an example of an ISMF message help panel.

```

HELP-----ISMF MESSAGE-----HELP
COMMAND==> _

MESSAGE NUMBER:  DGTMD006

SHORT MESSAGE:   DFHSM LEVEL UNKNOWN

LONG MESSAGE:    DFHSM LINE OPERATORS MAY FAIL - DFHSM V2 R2.1 OR LATER
                  NEEDED

EXPLANATION:
  ISMF was unable to determine the current level of Data Facility
  Hierarchical Storage Manager (DFHSM) on your system. Your DFHSM line
  operators (for example, HBACKDS or HRECALL) may not be processed if the
  minimum level of DFHSM is not installed on the system.

SUGGESTED ACTION:
  Contact your system programmer to verify the level of DFHSM on your
  system.

Use END to return to ISMF, no additional information is available.

```

Figure 17. ISMF—Message HELP Panel

ISMF message identifiers begin with the prefix **DGT**. ISPF message identifiers begin with **ISP** or **ISR**. On the help panel, the message identifier is in the **MESSAGE NUMBER** field, located at the upper left.

3. If ISMF issued the message, follow the procedure in "Messages Issued by ISMF" on page 45 to build the message type-of-failure keyword.
4. If ISPF issued the message, read the help panel to determine whether there is something you can do to resolve the problem.
5. If the help panel does not indicate how to correct the error, see the publication *ISPF Diagnosis*.

Messages Issued by Other Components

1. Record on the "Keyword Worksheet" on page 6 the message that interrupted the ISMF operation screen. For an example see Figure 14 on page 42.
2. Press the ENTER key to get the ISMF short error message. For an example, see Figure 15 on page 43.
3. Enter HELP to get the ISMF long error message. For an example, see Figure 16 on page 43.
4. Enter HELP again to get the help panel that defines the problem further. For an example, see Figure 17.

Read the help panel to determine if you can do something to resolve the problem. If the explanation provided does not indicate how to correct the error, continue with this procedure.

5. Examine the ISPF log for the message identifier. (See "ISMF's Use of the ISPF Log" in the related publication *MVS/DFP: Diagnosis Reference* for an example of the ISPF log.) The message identifier appears with the original error message. A list of possible three-letter prefixes for messages issued by some other products appears in Figure 18.
6. If the message starts with any of these prefixes, use the manual indicated in the following table to determine the recommended action.

Figure 18. ISMF—Message Prefixes for Other Products

Prefix	Component Name	Manual Name
ADR or DGT	DFDSS	<i>DFDSS: Reference</i>
ARC or DFQ	DFHSM	<i>DFHSM: Messages</i>
ICH	RACF	<i>System Messages</i>
IDC	Access method services	<i>System Messages</i>
IEC	Data management	<i>System Messages</i>
IKJ	TSO	<i>System Messages</i>
ISP or ISR	ISPF	(user response options are given on message panel)

7. Turn to "ISMF—Module Keyword" on page 67.

Messages Issued by ISMF

1. Read the help panel to determine if you can do something to resolve the problem. If the explanation provided does not indicate how to correct the error, continue this procedure.
2. Build the message keyword by appending the message identifier to the keyword prefix, **MSG**.

Example: If the message identifier is DGTMD006, specify the message type-of-failure keyword as shown:

MSGDGTMD006

If ISPF logging was in effect when the message was issued, specify the return code and reason code related to the message exactly as the system presents them. Continue with Step 3.

If ISPF logging was not in effect when the message was issued, type-of-failure keyword is complete, turn to "ISMF—Module Keyword" on page 67.

3. If the ISPF log was turned on when the message was issued, you must specify the message-related return code and reason code. To determine the return code and reason code, examine the ISPF log for the entry associated with the message identifier. (See "ISMF's Use of the ISPF Log" in the related publication *MVS/DFP: Diagnosis Reference* for a description of the ISPF log.) Record the return code and reason code exactly as they appear in the log, on the "Keyword Worksheet" on page 6 as modifier keywords.
4. Turn to "ISMF—Modifier Keywords" on page 91.

SMS—Message Keyword

Procedure

Before using this section, examine the publications *System Messages* and *System Codes*. These may help you generate additional keywords by identifying failure-related functions and providing message-to-module cross-reference tables.

See “Definition of Message Keyword Related Terms” on page 37 for definitions of the following terms used in this section:

- Message identifier
- Message keyword prefix
- Return or reason code
- Return or reason code keyword prefix

Message IGD300I

This message always accompanies an SMS abend.

1. Figure 19 on page 47 shows a sample SMS abend-related job log, which always contains message **IGD300I**.
2. Because this message reports an abend type-of-failure, do not specify the message identifier as a keyword. Turn to “SVC Dump” on page 18 and use that section to identify the failure-related keywords.

```
*****
      J E S 2 J O B L O G  -- S Y S T E M 3 0 8 1  -- N O D E N 1
07.39.08 JOB  29 $HASP373 S2RAS031 STARTED - INIT 1 - CLASS A - SYS 3081
07.40.13 JOB  29      S2RAS031  STEP 0      IKJEFT01   0000
07.40.19 JOB  29 DFPWTX30 ISSUING COMMAND.
07.40.20 JOB  29 *41 S2RAS031--REPLY GO STEP1
07.40.46 JOB  29 R 41,U
07.40.52 JOB  29      S2RAS031  STEP1      WTORPGM    0000
07.42.31 JOB  29      S2RAS031  STEP2      AMBLIST    0000
07.42.58 JOB  29      S2RAS031  STEP2      AMBLIST    0000
      IGD300I AN ABEND OCCURRED DURING SMS PROCESSING
      ABEND SYSTEM CODE=06F ASID=0010
      COMPONENT NAME=SMS COMPONENT ID=28462
      ACTIVE LOAD MODULE NAME=IGDZILLA ADDRESS=01BE1000
      CSECT IN ERROR      DESCRIPTION=BUILD MSG RTN 2
                          NAME=IGDMCSC2 ADDRESS=01BF5758 OFFSET=00000026
                          ASSEMBLY DATE=032487 PTF LEVEL=HDP3310
      PSW AT TIME OF ERROR 071C0000 81BF577E
      DATA AT PSW 01BF5778 - C5404040 400090EC D00C18CF
      GPR 0-3 008C7444 7F70FC78 00000010 00000000
      GPR 4-7 00000018 7F70FD10 7F70F434 7F70FD14
      GPR 8-11 7F70FDD8 01BF58B2 01BF48B3 7F70FAB0
      GPR 12-15 81BF38B4 7F70FAB0 81BF41B6 81BF5758
07.43.03 JOB  29 IGD306I UNEXPECTED ERROR DURING IGD306I PROCESSING
      RETURN CODE IS 8, REASON CODE IS 12008
      THE MODULE THAT DETECTED THE ERROR IS IGD306I
      SMS MODULE TRACE BACK - MCSCM DSP00 SSIRT
      SYMPTOM RECORD CREATED, PROBLEM ID IS IGD00025
07.43.04 JOB  29      S2RAS031  STEP3      IGD306I   0000
07.43.04 JOB  29 $HASP395 S2RAS031 ENDED
```

Figure 19. Sample SMS Failure Related Job Log Output

Message IGD306I

This message indicates that an SMS failure has occurred and that SMS has written a record to SYS1.LOGREC.

1. Print SYS1.LOGREC to obtain structured search keyword information. See the sample record in "SMS Records Written to SYS1.LOGREC" in the section "SMS Diagnostic Aids" of the related publication *MVS/DFP: Diagnosis Reference*. Use these keywords as the complete keyword string.
2. Turn to "Searching with the Keyword String" on page 3.

Message IGD311I

This message reports the same condition as **IGD306I**, except that SMS was unable to write a record to SYS1.LOGREC.

1. Record the module in error, the return code, and the reason code as keywords.

Note: The failure to write a record to SYS1.LOGREC is usually unrelated to the problem for which the record was being written. Message **IGD311I** also contains the return and reason codes from the unsuccessful attempt to

write the SYS1.LOGREC record. Do not specify these codes in the keyword string.

2. *If you wish to do a keyword search for the failure to write to SYS1.LOGREC, do not include the failing module name, return code, or reason code associated with the original failure. Specify only the message identifier, return code, and reason code related to the SYS1.LOGREC write failure.*
3. *If you wish to do a keyword search for the original failure, specify the original failure-related module name, return code, and reason code.*
4. Turn to "Modifier Keywords" on page 79.

VSAM Record Management—Message Keyword

VSAM record management does not issue any messages directly. However, the results of a record management request can be translated into a message issued by the user of record management. Use this section when your program or the system indicates that a VSAM data set is being processed.

Before using this section, examine the publications *System Messages* and *System Codes*. These may help you generate additional keywords by identifying failure-related functions and providing message-to-module cross-reference tables.

See “Definition of Message Keyword Related Terms” on page 37 for definitions of the following terms used in this section:

- Message identifier
- Message keyword prefix
- Return or reason code
- Return or reason code keyword prefix

Procedure

1. A damaged data set may cause one of the following messages to be issued by the caller of VSAM record management or by a system service routine (for example, EOVS or IOS) which was invoked by record management.

Messages

- MSGIDC3302I — Action error
 - MSGIDC3308I — Duplicate records
 - MSGIDC3314I — Out of sequence records, missing records, duplicate records, no record found
 - MSGIDC3351I — VSAM I/O error RC156, RC24, or RC32
 - MSGIDC3350I — No record found or incorrect length
 - MSGIEC070I — RC32, RC202, RC104, or RC203
 - MSGIEA000I — Command reject
2. If the system issues one of these messages while processing a KSDS, to determine whether you have a damaged data set, use the IDCAMS EXAMINE command as described in Chapter 4, “Functional Command Format,” in the publication *MVS/DFP: Access Method Services* and in Chapter 12, “Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors” in the publication *MVS/DFP: Managing VSAM Data Sets*. The EXAMINE command provides details about the nature of data set damage.

Example: If a damaged data set caused message IDC3302I to be issued, specify the message type-of-failure keyword as shown:

```
MSGIDC3302I
```

3. Turn to “Modifier Keywords” on page 79.

Incorrect Output Keyword

Use this section when a program or the system does not produce the expected output.

Symptoms of the Failure

Incorrect output failures can be identified by the following:

- Expected output is missing.
- Output is different than expected.
- Output should not have been generated.
- System indicates damage to the VTOC or VTOC index.
- ISMF panel information or flow is erroneous.

Incorrect output can be the result of a previous failure and can often be difficult to analyze because the component affected may not be the one that caused the problem. Review previous messages, abends, console logs, or other system responses. They may indicate the source of the failure.

Procedure

1. If a message accompanied the failure, append the message identifier to the prefix **MSG** and add this keyword to the keyword string. If the system *did not* issue a message, try to identify any failure-related control blocks, user areas, or data records and record them on the "Keyword Worksheet" on page 6 as modifier keywords.

Specify the incorrect output keyword as shown:

INCORROUT

2. If the system indicates damage to the VTOC or VTOC index, then DADSM or CVAF normally issues an error message. In this case, examine the "Standard Modifier Keyword List" on page 80 and go to the DADSM/CVAF-related "Incorrect Output Failure Modifier Keywords Procedure" on page 86 to identify applicable symptom keywords. If VTOC problems are not indicated, continue with this procedure.
3. Accumulate as much of the following information as possible. It can help you isolate/resolve your problem, and the IBM Support Center will request it if trap or trace information is needed.
 - When was the problem first noticed?
 - How was the problem identified (good output versus bad output)?
 - Were any system changes or maintenance recently applied? For example, a new device, software product, APAR, or PTF?
 - Does the problem occur with a specific data set, device, time of day, and so forth?
 - Does the problem occur in batch or TSO mode?
 - Is the problem solid or intermittent?
 - Can the problem be re-created?

4. Select the procedure for the failure-related component from the following table:

Component	Procedure
Device Console Services	Turn to "Device Console Services—Incorrect Output Keyword." on page 52
ISMF	Turn to "ISMF—Incorrect Output Keyword" on page 53
Media Manager	Turn to "Media Manager—Incorrect Output Keyword" on page 54
O/C/EOV (Common)	Turn to "Open/Close/End of Volume (Common)—Modifier Keywords" on page 98
SMS	Turn to "SMS—Incorrect Output Keyword" on page 55
VSAM Block Processor or Record Management	Turn to "VSAM Record Management/Block Processor—Incorrect Output Keyword" on page 56
VSAM Catalog Management	Turn to "VSAM Catalog Management—Incorrect Output Keyword" on page 58
All Other MVS/DFP Components	Turn to "Nonspecific MVS/DFP Components—Modifier Keywords" on page 103

Device Console Services—Incorrect Output Keyword.

Use this section when your program or the system produces other than the expected output and you suspect a failure in device console services.

Procedure

1. If the DEVSERV command causes messages to be issued which contain incorrect information, specify the incorrect output type-of-failure keyword as shown:

INCORROUT

2. Record the DEVSERV command-line parameters as modifier keywords on the "Keyword Worksheet" on page 6.
3. The message text may contain additional information that you can use as modifier keywords (function, subfunction, device-related information, and so forth); record it on the "Keyword Worksheet" on page 6.
4. Turn to "Nonspecific MVS/DFP Components—Module Keyword" on page 77.

ISMF—Incorrect Output Keyword

Use this section to determine the required action if an incorrect output condition occurs with an ISMF panel.

Procedure

Before reporting an ISMF panel problem, ensure that the incorrect output is not the result of a *customized panel or message*. If the panel is modified, retry the operation using the IBM-supplied copy. If the failure still occurs, continue with the following procedure:

1. For minor panel errors (spelling, punctuation, or grammar), submit an **ISMF Panel Comment Form** from the back of this publication.

Note: IBM does not accept APARs for minor panel errors (spelling, punctuation, or grammar).

2. For other panel problems or panel function errors, specify the incorrect output type-of-failure keyword as shown:

INCORROUT

3. Turn to “ISMF—Modifier Keywords” on page 91.

Media Manager—Incorrect Output Keyword

Use this section when the system produces other than the expected output and you suspect a failure in the media manager.

The media manager processes read and write requests from the following components for the types of records indicated:

Component	Record Type
CVAF	Indexed VTOC records contained in the SYS1.VTOCIX data set
VSAM Catalog	VVDS records contained in the SYS1.VVDS data set
DB2	DB2 records contained in the DB2 table/index spaces, and the DB2 log data set
IMS Fast Path	IMS records contained in the IMS data entry data base.

Incorrect output may be the result of a previous failure.

Procedure

1. If the media manager provides output that is missing or different than expected, the component that requested services from the media manager issues an explanatory message. If this occurs, specify the message keyword as the type-of-failure keyword instead of INCORROUT, and continue below. If no such message is issued, specify INCORROUT as the type-of-failure keyword and turn to "Module Keyword" on page 63.
2. Try to identify any significant failure-related keywords that appear in the message prefix, number, or text. Record them as modifier keywords on the "Keyword Worksheet" on page 6 for use in the software support data base search.
3. Turn to "Module Keyword" on page 63.

SMS—Incorrect Output Keyword

Use this section when the output of an SMS command or SMS related function is incorrect. SMS related processing includes:

- SMS operator commands
- ACS processing

Procedure

1. If the incorrect output includes a message, turn to "Message Keyword" on page 37 and describe the problem as a message type-of-failure, but include the **INCORROUT** keyword in the keyword string.
2. Identify the failure-related SMS function, for example, which SMS command was issued, which SMS class was assigned, and so forth.
3. Turn to "SMS—Modifier Keywords" on page 99.

VSAM—Incorrect Output Keyword

VSAM Record Management/Block Processor—Incorrect Output Keyword

Use this section to gather detailed information about an incorrect output type-of-failure related to either the VSAM block processor or VSAM record management.

Incorrect output may be caused by a previous failure. Examine the system and console logs for failure-related abends, messages, or return codes. A damaged VSAM data set can also cause incorrect output. Add any failure-related return codes to the keyword string, exactly as the system presents them. You may also add the abend or message type-of-failure keywords to the incorrect output keyword string to define the symptoms more closely.

Procedure

1. Determine whether failure-related record management return codes and reason codes exist.

VSAM provides return codes in register 15 and reason codes in either the access method control block (ACB) or the request parameter list (RPL). Reason codes in the ACB indicate VSAM open or close errors. Reason codes in the RPL indicate VSAM record management error indications returned to the caller of record management. See Chapter 1, “Macro Instruction Return Codes and Reason Codes” in the publication *MVS/DFP: Macro Instructions for VSAM Data Sets* for detailed information about these codes.

2. Record any failure-related RPL feedback word (a hexadecimal fullword) and RPL return code on the “Keyword Worksheet” on page 6 as modifier keywords. The IBM Support Center can use these values to identify a failure-related module and the nature of the incorrect output.

RPL feedback word (RPLFDBWD) = 000C0010—Indicates a physical error writing data.

Example: If the RPL feedback word is X'000C0010', specify the following keywords:

```
RPLFDBWD 000C0010
```

3. Determine whether you have a damaged VSAM data set.

Some incorrect output failures involve a damaged VSAM data set. To determine whether you have a damaged data set, use either IEHLIST or the IDCAMS EXAMINE command as described in Chapter 4, “Functional Command Format,” in the publication *MVS/DFP: Access Method Services*, and in Chapter 12, “Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors” in the publication *MVS/DFP: Managing VSAM Data Sets*. The EXAMINE command provides details about the nature of data set damage.

If these service aids indicate that the data set is *not damaged*, inform the IBM Support Center if you call for assistance. If they indicate that the data set is *damaged*, keep a copy of the output for possible use by the IBM Support Center. Be prepared to describe the type of data set damage. You

should attempt to recover the data set and rerun the failing job to determine whether the problem is resolved.

The system may indicate a damaged data set by one of the following:

- Messages (discussed in Message section)
- ABEND0C4 (discussed in ABEND section)
- Wait/Loop (discussed in Wait/Loop section)
- RPL feedback word—any of the following values in the RPL feedback word (RPLFDBWD):

2A080020	2B808820	2C080020	2D08009C
9108009C	9208009C	9408009C	
9508009C	9608009C	9708009C	9808009C
9908009C	9A08009C	9B08009C	
9C08009C	A608009C	A708009C	B608009C
D708009C	D808009C		
D908009C	DB808820	DF080020	E008009C
F0080020	F8080020		

- RPL error code field—any of the following values in the RPL error code (RPLERRCD) field:

32 (X'20')	Invalid RBA
156 (X'9C')	Invalid Control Interval (CI)

4. If the data set is damaged, rebuild it as directed at "VSAM—Record Management Damaged Data Sets" in the related publication *MVS/DFP: Diagnosis Reference*, and rerun the job.
5. Turn to "Modifier Keywords" on page 79.

VSAM Catalog Management—Incorrect Output Keyword

Use this section when the system produces other than the expected output and you suspect a failure in one of the following three catalog management areas:

- Integrated Catalog Processing
- CVOL Processing
- VSAM Catalog Processing

Procedure

Determine the extent of the incorrect output.

1. Use the LISTCAT command as described in Chapter 4, “Functional Command Format,” of the publication *MVS/DFP: Access Method Services* to obtain a complete listing of the catalog.
2. Use the IEHLIST program as described in the publication *MVS/DFP: Utilities* to obtain a listing of the VTOC. This may be useful when diagnosing problems in managing DASD volume space or in using access method services commands.
3. Use the DIAGNOSE command as described in Chapter 4, “Functional Command Format,” of the publication *MVS/DFP: Access Method Services* to determine whether an integrated catalog structure is correct. Include any reason codes produced by DIAGNOSE in your search argument.

Example: If the reason code is **23**, specify it as shown:

RC23

4. Use the IDCAMS EXAMINE command as described in Chapter 4, “Functional Command Format” of the publication *MVS/DFP: Access Method Services*, and in Chapter 12, “Checking a VSAM Key-Sequenced Data Set Cluster For Structural Errors,” in the publication *MVS/DFP: Managing VSAM Data Sets* to determine whether the catalog being used has been damaged, and the nature of the damage.

If the output of these service aids (LISTCAT, IEHLIST, or EXAMINE) indicates that the catalog *is not damaged*, inform the IBM Support Center if you call for assistance. If they indicate that the catalog *is damaged*, keep a copy of the output for possible use by the IBM Support Center. Be prepared to describe the type of catalog damage. You should attempt to recover the catalog and rerun the failing job to determine whether the problem is resolved.

5. Turn to “VSAM Catalog Management—Modifier Keywords” on page 101.

Performance Keyword

Use this section to define the performance keyword when you suspect that an MVS/DFP component is causing poor system performance.

Performance Failure Definition

Performance is defined as a measurement of either:

- System-related work accomplished within a given time, or
- The time required to complete a task/job based upon past performance.

Many performance problems are related to system tuning.

Modifications to your system or its environment can influence system performance. Consult with your IBM System Engineer (SE) for system tuning assistance.

Procedure

1. Use the performance keyword only when system performance cannot be improved by tuning, and performance is below explicitly stated expectations.
2. Record actual performance, expected performance, and the source of the expected performance criteria. Include the order number and page of the source document. If you contact the IBM Support Center, you will be asked for this information.
3. Specify the performance keyword as shown:

PERFM

4. If the problem is related to a function or module, specify the function or module name as a modifier keyword.

Example: If the module is **IFG0194A** and the function is **OPEN**, specify the keywords as shown:

IFG0194A OPEN

5. If possible, isolate the probable source of degraded performance to a specific MVS/DFP component.
6. Turn to "Component Identification Keyword" on page 105.

Documentation Keyword

Use this section when you encounter incorrect or missing information in an MVS/DFP publication.

Procedure

For a minor publication error, submit a Reader's Comment Form from the back of the publication in error. If the error is serious and of general concern to other users, continue with the procedure below.

Note: IBM does not accept APARs for minor publications errors (spelling, punctuation, or grammar).

1. Record the document page in error. Be prepared to describe the error and the problem it caused.
2. Specify the order number of the document after the prefix **DOC**, omitting the hyphen and level number.

Example: If the order number is LY26-3959-0, specify the type-of-failure keyword as shown:

DOC LY263959

3. For documentation problems related to a system message, append the message identifier to the keyword prefix **MSG**, add it to the keyword string as a modifier keyword.

Example: If the message is IEC147I, specify the modifier keyword as shown:

MSGIEC147I

4. For problems related to a function or module, specify the function or module name as a modifier keyword.

Example: If the module is **IFG0194A** and the function is **OPEN**, specify the modifier keywords as shown:

IFG0194A OPEN

5. Turn to "Searching with the Keyword String" on page 3.

Module Keyword

Use this section to build the module keyword for your keyword string. This keyword identifies the failure-related Control Section (CSECT). A load module consists of one or more individually replaceable CSECTs.

The CSECT name describes the area of suspected failure more precisely than the load module name, but you can specify either or both when varying the keyword string during the software support data base search.

Procedure

- If the system has given *some indication* of a failure-related module, specify the complete module name as the module keyword and turn to “Modifier Keywords” on page 79.
- You should be able to infer the probable failing component from a failure-related indication (message, unique abend code, and so forth).
- If you have a dump containing the nucleus and LPA, select the procedure for the failure-related component indicated in Figure 20.
- For some failures, you may find it impossible to identify a probable failing module. In this case, select the procedure for the failure-related component from the following table:

Figure 20. Building the Module Keyword

Component	Procedure
DADSM/CVAF	Turn to “DADSM/CVAF—Module Keyword” on page 64
DASD Common Services	Turn to “DASD Common Services—Module Keyword” on page 66
ISMF	Turn to “ISMF—Module Keyword” on page 67
Media Manager	Turn to “Media Manager—Module Keyword” on page 71
Open/Close/End of Volume	Turn to “Open/Close/End of Volume (Common)—Module Keyword” on page 72
SAM	Turn to “SAM—Module Keyword” on page 74
VSAM Catalog Management	Turn to “VSAM Catalog Management—Module Keyword” on page 75
All other MVS/DFP components	Turn to “Nonspecific MVS/DFP Components—Module Keyword” on page 77

DADSM/CVAF—Module Keyword

Use this section to build the module keyword for either the DADSM or CVAF components.

Procedure

Abend or Wait/Loop Type-of-Failure

1. For **ABEND** types-of-failure, the system may have issued message IEC999I, identifying the module in which the error occurred. If this occurs, go to Step 4 to determine if it is a DADSM module.
2. Using the PSW from the formatted part of the dump obtained earlier, or from the symptom dump (summary) information in the system job log, extract the data in the last four bytes of the PSW. These bytes contain the address of the instruction that follows the last instruction executed before the abend.
3. Using a map of the LPA and the instruction address, identify the name of the module that was in control when the abend occurred.
4. "DADSM Module-to-Function Cross Reference" in the related publication *MVS/DFP: Diagnosis Reference*, contains a complete list of DADSM module names and their related functions and subfunctions. If the module name you identified in Step 1 or Step 3 is in the list, the component is DADSM. Record the function and subfunction on the "Keyword Worksheet" on page 6 as modifier keywords.

Example: If the module name is **IGC0002G**, specify the keyword as shown:

IGC0002G

- For **ABEND** types-of-failure, turn to "DADSM/CVAF—Modifier Keywords" on page 84. For **WAIT** or **LOOP** types-of-failure, turn to "Release Level Keyword" on page 109.
5. If the module name begins with the letters ICV, CVAF is the failing component. At "CVAF Module-to-Function Cross Reference" in the related publication *MVS/DFP: Diagnosis Reference*, locate the CVAF module name and record the related function and subfunction on the "Keyword Worksheet" on page 6 as modifier keywords.

Example: If the module name is **ICVCMB00**, specify the keyword as shown:

ICVCMB00

- For **ABEND** types-of-failure, turn to "DADSM/CVAF—Modifier Keywords" on page 84. For **WAIT** or **LOOP** types-of-failure, turn to "Release Level Keyword" on page 109.

6. If neither Step 4 on page 64 nor Step 5 on page 64 have identified the suspected failing module, but you still suspect a failure in either DADSM or CVAF, develop two keyword strings, one for each component. Include the suspected module name in both keyword strings. The problem may have been previously reported with the same module name. Code the two strings as shown:

```
566528417 ABEND0C4 IGC0002G
```

or

```
566528425 ABEND0C4 ICVCMB00
```

If neither the DADSM nor CVAF search keyword strings yield usable results, and if the error might exist outside these two components, you may broaden the search by deleting the component identification keyword. Build a keyword string containing only the abend code and the module name as shown:

```
ABEND0C4 IGC0002G
```

or

```
ABEND0C4 ICVCMB00
```

These keyword strings may yield a previously reported problem (and its fix) in some component other than DADSM and CVAF.

- For **ABEND** types-of-failure, turn to "DADSM/CVAF—Modifier Keywords" on page 84. For **WAIT** or **LOOP** types-of-failure, turn to "Release Level Keyword" on page 109.

Message Type-of-Failure

1. Specify the module keyword using the DADSM or CVAF module name identified at "DADSM/CVAF—Message Keyword" on page 39.

Example: If the module name is IGG020P2, specify the module keyword as shown:

```
IGG020P2
```

2. Turn to "DADSM/CVAF—Modifier Keywords" on page 84.

DASD Common Services—Module Keyword

Use this section to build the module keyword for the DASD common services component. This keyword identifies the module related to a failure which results in the unsuccessful execution of one of the services.

Procedure

You can determine the name of the module detecting the error by using the problem determination area (PDA) except for common filter services, which neither employs an ESTAE nor uses a PDA.

The failure-related ISPF log entry's FEEDBACK field contains the PDA information. See the first entry in the sample ISPF log in "ISMF Diagnostic Aids" of the related publication *MVS/DFP: Diagnosis Reference* for a sample entry containing PDA information. See "DASD Common Services—Problem Determination Area (PDA)" in the same publication for a description of the PDA contents.

1. Use the module name identified in the PDA as the module keyword.
2. Record any other significant keywords on the "Keyword Worksheet" on page 6 with prefixes applicable to their nature. (For example, specify the return code as RCnn.)

Building the Module Keyword

1. **Example:** If the module name is **IGBDIS01**, specify the module keyword as shown:

IGBDIS01

2. Turn to "DASD Common Services—Modifier Keywords" on page 90.

ISMF—Module Keyword

For an abend type-of-failure, continue with the following procedure.

For all other types-of-failure, turn to “ISMF—Modifier Keywords” on page 91

Procedure

You can determine the name of the failing module for an abend in several ways, depending on how the system indicated the failure and the conditions under which you invoked ISPF and ISMF. The following table summarizes abend processing. To determine the module name, go to the section indicated under the “Type of Dump” column.

ISPF Mode	ISMF Profile	Abend Indicator	Type of Dump
Normal	RECOVER FROM ABENDS === > Y	ISMF abend panel	ISMF symptom dump, turn to “Using the ISMF Symptom Dump”
Normal	RECOVER FROM ABENDS === > N	ISPF abend panel	ISPF symptom dump, turn to “Using the ISPF Symptom Dump” on page 68
Test/Trace	RECOVER FROM ABENDS === > Y	ISMF abend panel	ISMF symptom dump, turn to “Using the ISMF Symptom Dump”
Test/Trace	RECOVER FROM ABENDS === > N	TSO error message	System abend dump, turn to “Using the Abend Dump” on page 69

See “Determining How ISMF Handles Abends and Takes Dumps” in the related publication *MVS/DFP: Diagnosis Reference* for information on controlling logging and dumps.

Using the ISMF Symptom Dump

If an abend occurs while executing ISMF, and logging is active, the system places an ISMF symptom dump (mini dump) in the ISPF log. If ISMF is able to capture the name of the failing module, it appears in the symptom dump. The format of the dump is shown in Figure 21.

```

14:32 ***** ISMF ERROR ***** - APPLICATION(DGTA - LIBRARY); FUNCTION(DEFINE)
14:32 - WORK.SCDS
14:32 - ISMF 3.2.0 FMID HDP3320 SYSTEM ABEND CODE 0C1
14:32 - XXXXXX NAME DGTFCLDA EPA 8260D5F8 PSW 07802000 8000002A
14:32 - DATA AT PSW 00000022 - 1000822E 3488078D 20008262 631E0000
14:32 - R0 00000000 R1 0270A554 R2 026E6618 R3 000535E0
14:32 - R4 00041698 R5 00000000 R6 000535E0 R7 00056800
14:32 - R8 0270A56C R9 026F98E7 R10 026E813C R11 0270A4CC
14:32 - R12 8260D5F8 R13 0270A4CC R14 8260D750 R15 00000000
    
```

Figure 21. ISMF—Symptom Dump in the ISPF Log

The name field in the symptom dump identifies the name of the failing module if it is available.

1. If you can determine the module name from the symptom dump:
 - a. Use the module name as the module keyword.

Example: If the module name is **DGTFLCDA**, specify the module keyword as shown:

```
DGTFLCDA
```
 - b. Turn to “ISMF—Modifier Keywords” on page 91.
2. If you cannot determine the module name from the symptom dump:
 - a. Continue with the procedures for determining the module name described in “Using the Abend Dump” on page 69. If you still cannot determine the module name, turn to “ISMF—Modifier Keywords” on page 91.

Using the ISPF Symptom Dump

If the ISMF profile variable indicates that ISMF is not to recover from abends, and ISPF is executing in normal mode, the system displays an ISPF abend panel and places an ISPF symptom dump in the ISPF log. See the sample ISPF log in “ISMF Diagnostic Aids” of the related publication *MVS/DFP: Diagnosis Reference* for a description of the ISPF log. The format of the ISPF symptom dump is shown in Figure 22.

```

14:45      ISP SUBTASK ABEND      - VS 03.8 ISP 2.3.0000 ABEND CODE = 00007A PSW FF85000D 00000000
14:45      ABEND                  - NAME EPA 01C8DB00 ISPSUBS EPA 81C01F88 ISPTBLS EPA 000236B0
14:45      REGISTERS AT           - R0 80000000 R1 8000007A R2 01CE2668 R3 00000001
14:45      ENTRY TO              - R4 00000001 R5 01CC0D28 R6 00027CB8 R7 00030B10
14:45      ABEND                  - R8 00000000 R9 0002E7A0 R10 01C6A304 R11 01CE3B24
14:45      ABEND                  - R12 80036534 R13 0002E7A0 R14 8003675C R15 00000000
    
```

Figure 22. ISPF Symptom Dump in the ISPF Log

The name field in the symptom dump identifies the name of the failing module if it is available.

1. If you can determine the module name from the symptom dump:
 - a. Use the module name as the keyword.

Example: If the module name is **DGTFLCDA**, (this is *not* the case in the sample ISPF symptom dump shown in Figure 22 above), specify the module keyword as shown:

```
DGTFLCDA
```
 - b. Turn to “ISMF—Modifier Keywords” on page 91.
2. If you cannot determine the module name from the symptom dump:
 - a. Continue with the procedures for determining the module name described in “Using the Abend Dump” on page 69. If you still cannot determine the module name, turn to “ISMF—Modifier Keywords” on page 91.

Using the Abend Dump

When the symptom of the failure is a TSO error message, use the save area trace section of the SYSUDUMP to determine the name of the failure-related module. See Figure 23 for a sample save area trace.

```

SAVE AREA TRACE

DGTFACTPR WAS ENTERED VIA CALL

SA 001639BC  WD1 00000000  HSA 0013D9C4  LSA 001636A4  RET 501197F 4  EPA 00141988  RO 00000000
              R1 00163CD0  R2 00163DB4  R3 00000001  R4 00000001  R5 001244B0  R6 00082400
              R7 FFFFFFFF  R8 0007D0FC  R9 00119C45  R10 000EF30C  R11 001639BC  R12 50118C46

DGTFTCMD WAS ENTERED VIA CALL          AT EP DGTFTCMD..85.289

SA 001636A4  WD1 00000000  HSA 001639BC  LSA 00123480  RET 40141AE 6  EPA 001531E8  RO 00000000
              R1 001638DC  R2 00163DB4  R3 00000001  R4 00000001  R5 001244B0  R6 00082400
              R7 FFFFFFFF  R8 00000000  R9 00119C45  R10 000EF30C  R11 001636A4  R12 5014198E

UNKNOWN WAS ENTERED VIA CALL          AT EP ISPSCP.83316

SA 00123480  WD1 000F1448  HSA 001636A4  LSA 00082558  RET 601533F 8  EPA 000418B8  RO 00000000
              R1 00077410  R2 00163DB4  R3 00000001  R4 00000001  R5 001244B0  R6 00082400
              R7 FFFFFFFF  R8 00000000  R9 00123480  R10 000EF30C  R11 001636A4  R12 40153204

UNKNOWN WAS ENTERED VIA CALL          AT EP ISPSRT.83316

SA 00082558  WD1 FF000060  HSA 00123480  LSA 000825B8  RET 5004194 4  EPA 00043BD0  RO 00000000
              R1 000825A8  R2 00163DB4  R3 00000001  R4 000850A8  R5 00153514  R6 00000000
              R7 FFFFFFFF  R8 00000000  R9 00077408  R10 000EF30C  R11 001636A4  R12 000418B8

UNKNOWN WAS ENTERED VIA CALL          AT EP ISPSRV.83316

SA 000825B8  WD1 FF000428  HSA 00082558  LSA 000829E0  RET 6004433 E  EPA 000446C0  RO 00000000
              R1 000827F8  R2 00000002  R3 00000062  R4 00000000  R5 00077408  R6 0008283C
              R7 00042F6C  R8 00082824  R9 00077408  R10 0008282C  R11 000850A8  R12 00043BD0

UNKNOWN WAS ENTERED VIA CALL          AT EP ISDVDEL.83315

SA 000829E0  WD1 FF000098  HSA 000825B8  LSA 00082A78  RET 600447F A  EPA 0002EF48  RO 00000000
              R1 0008283C  R2 00000002  R3 00000062  R4 00042F6C  R5 000850A8  R6 0008283C
              R7 00042F6C  R8 0000039A  R9 00077408  R10 000001F0  R11 000850A8  R12 000446C0

SA 00082A78  WD1 FF000188  HSA 000829E0  LSA 00000000  RET 5002F2D A  EPA 0010681C  RO 00000020
              R1 00165470  R2 000850A8  R3 00000007  R4 0000001C  R5 00000020  R6 000850A8
              R7 00106E9C  R8 000828A8  R9 00077408  R10 00000008  R11 00000000  R12 0002EF48

INTERRUPT AT 00153462
    
```

Figure 23. ISMF—Finding the Module Name in a SYSUDUMP

1. Examine the SAVE AREA TRACE section of the SYSUDUMP.
2. Scan the left-hand margin, looking for the words INTERRUPT AT. (See Figure 23 for an example.)
3. Look at each entry in the SAVE AREA TRACE section of the dump (scanning upward from the interrupt address) and find the EPA (entry point address) that is less than (but closest to) the interrupt address.

- The name of the failing module is located in the row above its EPA (the one that you found in Step 3 on page 69) in the center of the page. The module name should appear in one of the following two sets of words:

WAS ENTERED VIA CALL AT EP module name

-or-

WAS ENTERED VIA LINK AT EP module name

In Figure 23 on page 69, the module name for the failure is highlighted.

- Specify the module name as the module keyword.

Example: If the module name is **DGTFTCMD**, specify the module keyword as shown:

DGTFTCMD

- Turn to "ISMF—Modifier Keywords" on page 91.

Media Manager—Module Keyword

For abend, wait, or loop types-of-failure in the media manager, use the following procedure to build the module keyword.

Procedure

1. Locate in the dump obtained earlier the media manager process block (MMPB). The MMPB is near the beginning of the summary dump, and the acronym **MMPB** in EBCDIC representation is at offset 0 of the MMPB. See the sample media manager dump in "Media Manager Diagnostic Aids" of the related publication *MVS/DFP: Diagnosis Reference*.

Use the 1-byte MMPMODID field at offset X'1C' in the MMPB to identify the media manager module in control when the failure occurred. The code values in the field are the same as the values in the *ff* field of the media manager return codes, listed at "Media Manager Return Codes" in the related publication *MVS/DFP: Diagnosis Reference*.

Example: If the MMPMODID field value is **05**, specify the module keyword as shown:

```
ICYCCHHR
```

2. Turn to "Modifier Keywords" on page 79.

Open/Close/End of Volume (Common)—Module Keyword

Use this section to build the module keyword for common O/C/EOV.

Procedure

Use one of the following three procedures:

Abend Type-of-Failure

1. If the failure is indicated by an abend **001**, the failure is in the SAM component. Change the component identification keyword to indicate the SAM component (see Figure 35 on page 105) and turn to "SAM—Module Keyword" on page 74 to build the module keyword.
2. If the system issued a message identifying an abend condition, and the module name appears in the message text, specify the module name keyword as shown in the fourth step below. If the name does not appear in the message, do the following:
 - a. Using the formatted section of the dump, scan the RBs for the job in question, looking for the one representing the failing user program.
 - b. The interrupt code field in the user's RB should indicate an SVC code representing the call to the MVS/DFP service that abended. The next RB represents the failing MVS/DFP Service. Its interrupt code field (IC portion of the WC-L-IC field) should match the abend code.
 - c. Using the address portion of the PSW field in that RB, locate that address in the dump and scan toward **either** the lower or higher addresses, looking in the translated EBCDIC in the right-hand column for a module name. Common O/C/EOV modules contain the module name in the copyright information at the start of each CSECT and in the XCTL table at the end of each CSECT. You may also determine the module name by matching the PSW instruction address with the addresses in an LPA map (all common O/C/EOV modules reside in the LPA).
 - d. Specify the entire module name as the module keyword.

Example: If the name is **IFG0194C**, specify the module keyword as shown:

IFG0194C

3. Turn to "Open/Close/End of Volume (Common)—Modifier Keywords" on page 98.

Wait/Loop Type-of-Failure

You should have obtained a system dump and determined the instruction address as directed earlier. If the problem is a loop, you may find it necessary to obtain either a module-to-module trace, a GTF trace, or a SLIP trace. (See "OPEN/CLOSE/EOV (Common) Diagnostic Aids" in the related publication *MVS/DFP: Diagnosis Reference* for details.)

1. Once you determine a failure-related module, specify it as the module keyword.

Example: If the module name is **IFG0194C**, specify the keyword as shown:

IFG0194C

2. Turn to "Open/Close/End of Volume (Common)—Modifier Keywords" on page 98.

Message Type-of-Failure

1. If a system message contains a failure-related module name or significant modifier keyword information, record these items on the "Keyword Worksheet" on page 6
2. Turn to "Open/Close/End of Volume (Common)—Modifier Keywords" on page 98.

SAM—Module Keyword

Use this section to build the module keyword for the SAM component.

Procedure

If the failure is indicated by an **ABEND001**, use the following procedure to determine the module name. Otherwise, turn to "Component Identification Keyword" on page 105.

1. Using the formatted portion of the dump obtained earlier, scan the RBs for the job in question, looking for the one that issued an EOVSVC just prior to the abend. The INTCODE field of the RB contains X'0037' for jobs that issued an EOVSVC. See the sample formatted dump in Figure 9 on page 24 to locate the INTCODE field. (The example does not show an INTCODE field with a value of X'0037'.)
2. The instruction address in the RB's PSW is the failure-related address. Determine the module name by matching that address with the addresses in an LPA map (all SAM modules reside in the LPA).
3. Use the entire module name as the module keyword.

Example: If the module name is **IGG019BB**, specify the module name keyword as shown:

```
IGG019BB
```

If the system issued message IEC020I to inform the system operator of the abend, the message text identifies the O/C/EOV module that processes SAM abend 001s. Record the module name. If your keyword string does not produce any similar problems in the software support data base, replace the SAM module name with the O/C/EOV module name that appears in the IEC020I message and execute the search again.

4. Turn to "Modifier Keywords" on page 79.

VSAM Catalog Management—Module Keyword

Use this section to build the module keyword for the VSAM Catalog Management components. The catalog management components are:

- Integrated catalog facility
- VSAM catalog

Procedure

1. To determine which module is related to the failure, scan backward in the dump. Using the failing PSW address from either the abend or the wait/loop keyword procedure as a starting point (see the EPSW in the sample formatted dump in Figure 9 on page 24 or the sample R/TM work area summary in Figure 10 on page 28), scan the translated EBCDIC output in the right-hand column for a module name. (In the sample formatted dump portion in Figure 24 it is IGG0CLAT.) Specify the entire module name as the module keyword.

```
000192A0 00 00000008 00015246 00070B9E 0001815A 000183CE 0001DE66 0001C13E 0004ED16 *......A.....*
000192C0 00 0003B8AA 00010A42 0001F3BE 0001FD36 000201EE 000230CE 0002D316 00038C2E *......3.....L.....*
000192E0 00 000458FE 0004A40A 0004A97E 00000000 000475CE 00038056 0001A14E 00057B8E *......*
00019300 00 00053822 0005582A E2E8E2F1 48E5E5C4 E24BE5C7 C5D5C4E2 D7404000 00000000 *......SYS1.VVDS.VGENDSP .....*
00019320 00 47F0F024 C9C7C7F0 C3D3C1E3 F0F861F3 F161F8F6 C8C4D7F3 F3F1F040 D5D6D5C5 *.00.IGG0CLAT08.31.84HDP3310 NONE*
00019340 00 40404040 C9C7C7D7 C3C4E5D9 07FE90CE D00C41DD 000C05C0 41A0CFFF 4190AFFF * IGGPCDVR.....*
00019360 00 50D0B12C D202B40D A5A64110 B13092FC B13991A0 10080A04 181F1211 4780C040 *...K.....*
00019380 00 D203B004 A5B958F0 A65D05EF 41A0CFFF 4190AFFF 47F0C052 9180B314 47E0C04C *K.....0.....*
000193A0 00 45E0CDF6 D2F7B314 B31C9500 B0074780 C06292A4 B00D45E0 CD2E5850 B4105050 *...6K7.....*
```

Figure 24. VSAM Catalog Management Sample SVC Dump—Module Name in EBCDIC Section

2. You may obtain a map of the catalog load module by either:
 - Executing the LISTLOAD XREF option of AMBLIST for modules IGG0CLHA and IGG0CLX0.
 - Using the map of modules IGG0CLHA and IGG0CLX0 provided in all CAS SVC dumps. Figure 25 on page 76 shows part of such a map. For each CSECT in load modules IGG0CLHA and IGG0CLX0, the map includes:
 - The starting address of the CSECT
 - The CSECT name
 - The CSECT FMID
 - The CSECT service level.
3. Turn to "VSAM Catalog Management—Modifier Keywords" on page 101.

CAS Module CSECT MAP:

01AEA000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	*.....*
01AEA020	TO NEXT LINE ADDRESS SAME AS ABOVE									
01AEA980	C9C7C7D4	D6C4D4D7	00001680	01AEA9A0	01AEABC0	00000000	00000000	00000000	00000000	*IGGMODMP.....*
01AEA9A0	C9C7C7F0	C3D3C8C1	00CC4000	00CCEE48	00000010	00000000	00000000	00000000	00000000	*IGG0CLHA.....*
01AEA9C0	00CC4000	C9C7C7F0	C3D3C8C1	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHAHDP3310 NONE ...*
01AEA9E0	00CC6BB8	C9C7C7F0	C3D3C8C2	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHBHDP3310 NONE ...*
00CCAA00	00CC5760	C9C7C7F0	C3D3C8C3	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHC HDP3310 NONE ...*
01AEA020	00CC74D8	C9C7C7F0	C3D3C8C4	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...QIGG0CLHDHDP3310 NONE ...*
01AEA040	00CC8A60	C9C7C7F0	C3D3C8C5	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHEHDP3310 NONE ...*
01AEA060	00CC7BF0	C9C7C7F0	C3D3C8C6	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...0IGG0CLHFHDP3310 NONE ...*
01AEA080	00CC8288	C9C7C7F0	C3D3C8C5	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHVHDP3310 NONE ...*
01AEA0A0	00CC8428	C9C7C7F0	C3D3C8F0	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH0HDP3310 NONE ...*
01AEA0C0	00CC8A60	C9C7C7F0	C3D3C8F1	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH1HDP3310 NONE ...*
01AEA0E0	00CC9590	C9C7C7F0	C3D3C8F2	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH2HDP3310 NONE ...*
01AEAB00	00CC9E70	C9C7C7F0	C3D3E7C1	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLXAHDP3310 NONE ...*
01AEAB20	00CCB2B8	C9C7C7F0	C3D3E7C2	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLXBHDP3310 NONE ...*
01AEAB40	00CC898	C9C7C7F0	C3D3E7C3	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...H.IGG0CLXCHDP3310 NONE ...*
01AEAB60	00CCD200	C9C7C7F0	C3D3E7C4	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...K.IGG0CLXDHP3310 NONE ...*
01AEAB80	00CCE180	C9C7C7F0	C3D3E7C5	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLXE HDP3310 NONE ...*
01AEABA0	00CCE7D8	C9C7C7F0	E3D9D4F1	C8C4D7F3	F3F1F040	61F0F461	40404040	00000000	00000000	*...XQIGG0TRM1HDP3310 NONE ...*
01AEABC0	C9C7C7F0	C3D3E7F0	000098C8	00081000	00000084	00000000	00000000	00000000	00000000	*IGG0CLX0...H.....*
01AEABE0	000098C8	C9C7C7F0	C3D3E7F0	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...HIGG0CLX0HDP3310 NONE ...*
01AEAC00	0000AC30	C9C7C7F0	C3D3C6F0	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF0HDP3310 NONE ...*
01AEAC20	0000BF8E	C9C7C7F0	C3D3C1C8	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...YIGG0CLAHDP3310 NONE ...*
01AEAC40	0000D628	C9C7C7F0	C3D3C1F3	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...0.IGG0CLA3HDP3310 NONE ...*
01AEAC60	0000F5C0	C9C7C7F0	C3D3C6F5	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...5.IGG0CLF5HDP3310 NONE ...*
01AEAC80	00010900	C9C7C7F0	C3D3C5C7	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLEGHDP3310 NONE ...*
01AEACA0	00011DB0	C9C7C7F0	C3D3C6F4	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF4HDP3310 NONE ...*
01AEACC0	00012CD8	C9C7C7F0	C3D3C6F6	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...QIGG0CLF6HDP3310 NONE ...*
01AEACE0	00014768	C9C7C7F0	C3D3C2F6	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLB6HDP3310 NONE ...*
01AEAD00	00015218	C9C7C7F0	C3D3C5C1	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLEAHDP3310 NONE ...*
01AEAD20	00017288	C9C7C7F0	C3D3C6E3	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLFTHDP3310 NONE ...*
01AEAD40	00018990	C9C7C7F0	C3D3C5C8	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLEHHDP3310 NONE ...*
01AEAD60	00019320	C9C7C7F0	C3D3C1E3	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLATHDP3310 NONE ...*
01AEAD80	0001AA00	C9C7C7F0	C3D3C6F1	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF1HDP3310 NONE ...*
01AEADA0	0001B460	C9C7C7F0	C3D3C6F3	C8C4D7F3	F3F1F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF3HDP3310 NONE ...*

Figure 25. VSAM Catalog Management—Sample CAS SVC Dump of CSECT Address Map

Nonspecific MVS/DFP Components—Module Keyword

Use this section to build the module keyword for MVS/DFP components for which no unique procedure exists.

Procedure

Use one of the following procedures:

Abend Type-of-Failure Procedure

1. If the system issued a message identifying an abend condition, the module name may appear in the message text. If it does, go to Step 3d.
2. If an EREP software record exists for the failure, use the failing PSW address with maps of the nucleus and LPA to determine the failing module, then go to Step 3d. (See the publication *EREP User's Guide and Reference* for details.)
3. If neither condition is true, continue below:
 - a. Using the formatted section of the dump, scan the RBs for the job in question, looking for the one representing the failing user program.
 - b. The interrupt code field in the user's RB should indicate an SVC code representing the call to the MVS/DFP service that abended. The next RB represents the failing MVS/DFP Service. Its interrupt code field (IC portion of the WC-L-IC field) should match the abend code.
 - c. Using the address portion of the PSW field in that RB, locate that address in the dump and scan toward the lower addresses, looking in the translated EBCDIC in the right-hand column for a module name. Most MVS/DFP modules contain the module name at the start of each CSECT. You may also determine the module name by matching that address with the addresses in a map of the nucleus or LPA.
 - d. Specify the entire module name as the module keyword.
4. Turn to "Modifier Keywords" on page 79.

Wait/Loop Type-of-Failure Procedure

You should have obtained a system dump and determined the instruction address as directed earlier. If the problem is a loop, you may find it necessary to obtain a GTF trace.

1. Using the instruction address from the waiting or looping RB's OPSW field and the NUCMAP or LPAMAP (as directed at Step 5 on page 32), determine which module resides at that address, and specify the entire module name as the module keyword.
2. Turn to "Modifier Keywords" on page 79.

Message Type-of-Failure Procedure

1. If the message text or format is incorrect, use the “Message-to-Module” table in Appendix A of the publication *System Messages* to identify the *issuing module*, and specify the module name as the module keyword.

If the message was issued at the wrong time or under the wrong conditions, use the same table and specify the name of the *detecting module* as the module keyword.

2. Turn to “Nonspecific MVS/DFP Components—Modifier Keywords” on page 103.

Modifier Keywords

Use this section to build the modifier keywords (function, subfunction, or other modifying information). The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to describe unique failure characteristics.

You can often identify the failing function and subfunction when you determine the type-of-failure. You may be able to identify a failure-related general register or control block (invalid data, same value every time the failure occurs, and so forth). You should be able to identify the probable failing component from a failure-related indication (message, unique abend code, and so forth).

Procedure

1. Examine the “Standard Modifier Keyword List” on page 80 to see if any modifier keywords describe an aspect of the failure. Record any such keywords on the “Keyword Worksheet” on page 6.
2. For incorrect output or performance types-of-failure, the system may not provide enough information to identify a failure-related module. If, however, you can identify a failure-related function or other modifier, specify them as the modifier keyword(s). Turn to “Component Identification Keyword” on page 105.
3. For all other types-of-failure, select the procedure for the failure-related component from the following table:

Component	Procedure
DADSM/CVAF	Turn to “DADSM/CVAF—Modifier Keywords” on page 84
DASD Common Services	Turn to “DASD Common Services—Modifier Keywords” on page 90
ISMF	Turn to “ISMF—Modifier Keywords” on page 91
Media Manager	Turn to “Media Manager—Modifier Keywords” on page 94
Open/Close/End of Volume (Common)	Turn to “Open/Close/End of Volume (Common)—Modifier Keywords” on page 98
SMS	Turn to “SMS—Modifier Keywords” on page 99
VSAM Catalog Management	Turn to “VSAM Catalog Management—Modifier Keywords” on page 101
All other MVS/DFP components	Turn to “Nonspecific MVS/DFP Components—Modifier Keywords” on page 103

4. If SYS1.LOGREC contains a failure-related hardware record, identify the status and hardware device type using the following list of modifier keywords.

Standard Modifier Keyword List

This list of modifier keywords demonstrates the standards you must follow when specifying them. Keywords preceded by an asterisk (*) indicate invalid keywords. The invalid keyword description provides the correct keyword.

Keyword	Meaning
*APAR <i>nnnnn</i>	Use OY <i>nnnnn</i> or OZ <i>nnnnn</i> as appropriate (for example, OY12345 or OZ12345)
*CA split	Use CI/CA SPLIT
CCxx	Condition code (exactly as the system presents it)
CHAN	Channel
*CI split	Use CI/CA SPLIT
CI/CA SPLIT	Control interval and/or control area split
*Catalog Management	Use CATMGT
CMD REJ	Command reject (hardware sense bit)
*Command reject	Use CMD REJ
*Condition code	Use CCxx (exactly as the system presents it)
*Control block	Use the standard control block identifier, for example, DCB, AMB, RPL, and so forth
COREOVERLAY	Main storage overlay or overlaid
CPC	Channel program check (hardware sense bit)
CREGnn	Control register
*Cross-Memory mode	Use XMM
CVOLCAT	CVOL catalog
DCK	Data check (hardware sense bit)
*Device Type <i>nnnn</i>	Use D/T <i>nnnn</i> (for example, D/T3380)
D <i>nnnnnnnnn</i>	DADSM diagnostic information (<i>nnnnnnnn</i> is four hex bytes)
D/T <i>nnnn</i>	Device type related to problem, if only one device type experiences the failure
*Duplicate Records	Use DUPREC
DUPREC	Failure causes duplicate records in a data set
EQC	Equipment check (hardware sense bit)
ESDS	Entry sequenced data set
*Format- <i>n</i> DSCB	Use F <i>n</i> DSCB

Keyword	Meaning
F n DSCB	Type of DSCB (n is a decimal digit, for example F4DSCB)
ICC	Interface control check (hardware sense bit)
*Integrated Catalog Facility catalog	Use ICFCAT
ICFCAT	Integrated catalog facility catalog
IDCAMS	Access method services
INDEX	Data set index (used when describing data set damage)
*Instruction	Use INST/xxx
INST/xxx	Failing instruction mnemonic (for example, INST/MVCL)
KSDS	Key sequenced data set
*Label xxxxxx	Use LBLxxxxxx (for example, LBLNAME01). Note: For PLS-generated labels, omit the @.
LBLxxxxxx	Program listing statement label xxxxxx
*Lost records	Use MISSREC
LDS	Linear data set
*Missing records	Use MISSREC
*Manuals	Do not use hyphens (for example, GC264149)
MASTCAT	VSAM master catalog (MCAT is also permissible)
*Master catalog	Use MASTCAT or MCAT
MCAT	VSAM master catalog (MASTCAT is also permissible)
MISSREC	Missing records from a data set
*Model number (hardware device)	Use D/T with a 3-digit model number (D/T3380 023)
NCA	Not capable (tape hardware sense bit)
*No record found	Use NRF
NRF	No record found in data set
*Open/Close/EOV	Use O/C/EOV
O/C/EOV	Open/close/end of volume (common component of MVS/DFP)
*Out of sequence	Use OUTOFSEQ

Keyword	Meaning
OUTOFSEQ	Record keys out of sequence
OVR	Overrun (hardware sense bit)
PROGCK	Program check
*Program check	Use PROGCK
*PTF <i>nnnnn</i>	Use UY <i>nnnnn</i> or OZ <i>nnnnn</i> as appropriate (for example, UY12345 or UZ12345)
*Publications	Do not use hyphens (for example, GC264149)
RC <i>nnn</i>	Return code, reason code, function code, error code, and so forth (exactly as the system presents it)
*Reason Code	Use RC <i>nnn</i> (exactly as the system presents it)
RECMGT	Record management function of VSAM
*Record Management	Use RECMGT
*Record Management Trace	Use RMTRACE
REG <i>nn</i>	General purpose register (use two decimal digits, for example, REG02 or REG14)
*Registers	Use REG <i>nn</i> for general purpose registers, CREG <i>nn</i> for control registers, and FPREG <i>nn</i> for floating point registers (<i>nn</i> is either one or two decimal digits with leading zeros.)
*Release Level	Use R <i>nnn</i>
*Return Code	Use RC <i>nnn</i> (exactly as the system presents it)
RMTRACE	Record management trace facility of VSAM
RPLFDBWD <i>nnnnnnnn</i>	RPL feedback-word (<i>nnnnnnnn</i> is four hex bytes)
RRDS	Relative record data set
*Share options	Use SHROPT
SHROPT	VSAM share options
SKC	Seek check (DASD hardware sense bit)
*Storage Overlay	Use COREOVERLAY
SVC <i>nn</i>	Supervisor call Instruction (<i>nn</i> is decimal, no leading zeros, or use 0 <i>Ann</i> (<i>nn</i> is hexadecimal)
*Supervisor Call	Use SVC <i>nn</i> or 0 <i>Ann</i>

Keyword	Meaning
UCAT	User catalog (USERCAT is also permissible)
UCK	Unit check (hardware sense bit)
UEX	Unit exception (hardware sense bit)
USERCAT	User catalog (UCAT is also permissible)
*User catalog	Use UCAT or USERCAT
*VSAM Catalog	Use VSAMCAT
VSAMCAT	VSAM catalog (non-integrated catalog facility catalog)
*Volume table of contents	Use VTOC
*VSAM master catalog	Use MASTCAT or MCAT
VTOC	DASD volume table of contents
WRI	Write inhibit switch should be checked (DASD hardware sense bit)
*Wrong record	Use WROREC
WROREC	Wrong record in data set
0Ann	Supervisor call instruction (<i>nn</i> is hexadecimal)

DADSM/CVAF—Modifier Keywords

Use this section to build the modifier keywords (function and subfunction) for DADSM and CVAF. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area.

Common Procedure

For a description of the conditions associated with nonzero return codes, reason codes and status codes related to failures in either the DADSM create (allocate), rename, or scratch functions, see "DADSM/CVAF Diagnostic Aids" in the related publication *MVS/DFP: Diagnosis Reference*. If one of these DADSM functions fails, it provides a nonzero DADSM return code and four bytes of diagnostic information (in the accompanying **IEC614I** message) which you should specify as modifier keywords. The four bytes of diagnostic information consist of the DADSM error code, the subfunction identifier, the subfunction return code, and the subfunction reason code.

1. The DADSM return code is provided in register 15. Specify the return code **exactly** as the system provides it.

Example: If the return code is **04**, specify the modifier keyword as shown:

```
RC04
```

2. The four bytes of diagnostic information are provided in register 0. See "Chapter 1" and "Chapter 5" in the publication *MVS/DFP: System Programming Reference* for further information. If the diagnostic information bytes are relevant to your failure, specify them as a single modifier keyword in the following order:
 - DADSM error code
 - Subfunction identifier
 - Subfunction return code
 - Subfunction reason code.

Example: If the four bytes are **08170486**, specify the modifier keyword as shown:

```
DI08170486
```

3. Continue below with the applicable procedure.

Abend Failure Modifier Keywords Procedure

Two function tables exist—one for **DADSM** functions, and one for **CVAF** functions.

- If the failure occurred in a DADSM function, use the DADSM function table; if it occurred in a CVAF function, use the CVAF function table.
- Record the function and/or subfunction as modifier keywords on the "Keyword Worksheet" on page 6,

Example: If the function is **ALLOC** and the subfunction is **INIT**, specify the modifier keywords as shown:

```
ALLOC INIT
```

- Turn to "Component Identification Keyword" on page 105.

Table of DADSM Functions

Function	Subfunction	Description
CREATE (ALLOCATE)	INIT	Initializes space allocation and routes requests to the appropriate subfunction
	NONIALL	Allocates space for everything except ISAM data sets
	IALL	Allocates space for ISAM data sets
	CONV	Converts a DOS VTOC, or an OS indexed VTOC whose VTOC index has been disabled, to the standard nonindexed OS VTOC format, enabling OS VTOC DADSM routines to be used
EXTND		Allocates secondary space for data sets
LSPACE		Calculates available space on a direct access volume and writes SMF record 19
OBTN		Reads DSCBs from the VTOC
PRLSE		Frees unused space
RNAME		Renames data sets
SCRTCH		Deletes a data set or VSAM data space
UPDATE		Updates DSCBs
VRF		Recovers from interruptions in DADSM for indexed VTOCs

Table of CVAF Functions

Function	Subfunction	Description
CM		Initializes CVAF processing and provides services to other CVAF functions
DM		Uses the maps in the VTOC index to manage space on a direct access device
DS		Reads and writes DSCBs and VTOC index records
FI		Reads sets of DSCBs for one or more data sets specified by a qualifier list
GT		Prompts the system operator through WTOR for: <ul style="list-style-type: none"> • Unit addresses for which GTF tracing of CVAF events is to be started or stopped. • CVAF debug/trap options.
IX	ADD	Adds an index entry to an indexed VTOC
	DEL	Deletes an index entry from an indexed VTOC
	SRCH	Retrieves a specified entry in a VTOC index entry record
LS		Responds to a volume demount system event and invalidates the VTOC information block
SM		Notifies SMS of space usage changes on an SMS-managed volume
TS		Tests for the presence of CVAF on the system and for an indexed VTOC on a specific volume
VO		Initializes the VTOC information block
VR		Records and retrieves VTOC recovery data in the VTOC index

Incorrect Output Failure Modifier Keywords Procedure

You may find it difficult to determine either the function or the module that caused the problem. One DADSM or CVAF function may modify and write the VTOC or VTOC index record, and some other unrelated function may detect a problem later. Or, you may detect the problem in a listing of the VTOC or VTOC index.

1. Use the CVAF generalized trace facility (GTF) trace to trace the CVAF events. You must have started GTF with the trace option USR. To start CVAF tracing, enter the command:

```
START CVAFTR
```

- a. Examine the GTF trace records to determine the events leading to the failure.

The event identification ID is located at offset 14 (X'0E') in the trace record. CVAF event IDs and the corresponding events and functions are as follows:

Event ID	Event	Function
0FAF	Write DSCB	DS
0FB0	Write VTOC index record (VIR)	DS
0FB1	Add index	IX
0FB2	Delete index	IX
0FB3	Allocate space	DM
0FB4	Release space	DM
0FB5	Allocate VTOC index space	DM
0FB6	Release VTOC index space	DM
0FB7	Allocate VTOC space	DM
0FB8	Release VTOC space	DM

- b. You can usually identify the function that caused the incorrect output by determining the macro that was issued. If it was a DADSM macro, the failing component is **DADSM**; go to Step 1d. If it was a CVAF macro, the failing component is **CVAF**; go to Step 1e. If you cannot determine whether the failing component is DADSM or CVAF, obtain the component identifiers for both components at "Component Identification Keyword" on page 105. Record them for use in the software data base search procedure. Build two keyword strings, one with each component identifier.
- c. Turn to "Component Identification Keyword" on page 105.
- d. See "Table of DADSM Functions" on page 85 to determine the failing **DADSM** function. Code the keyword(s) **exactly** as they are shown in the table.

The DADSM function modifier keywords are merely abbreviations of the related DADSM functions. The SCRATCH, RENAME, OBTAIN, and PROTECT macros are DADSM macros and they invoke DADSM functions. SVCs exist for each of these macros, as well as for ALLOC and LSPACE. System internal calls invoke the DADSM extend and partial release functions so you must identify these functions from failure-related events.

Turn to "Component Identification Keyword" on page 105.

- e. See "Table of CVAF Functions" on page 86 to determine the failing **CVAF** function; code the keyword(s) **exactly** as they are shown in the table. All CVAF macros except CVAFTST are associated with a CVPL. For those macros, go to Step 1j on page 88. For CVAFTST, continue here.
- f. If the CVAFTST macro returned an invalid return code, specify **TS** as the modifier keyword.
- g. If the CVAF GTF trace data is invalid, specify **GT** as the modifier keyword.

- h. If a volume demounted by the system did not cause CVAF to rebuild the VIB, either the CVAF **LS** function or the function that issued the demount (OPEN, EOVS, VSAM OPEN, Scheduler) failed. Specify the modifier keyword accordingly.

Note: Demount is not a DADSM/CVAF function.

- i. Turn to “Component Identification Keyword” on page 105.
- j. Locate the CVPL, which is in the DADSM work area. Use the eyecatcher by scanning the readable portion of the DADSM work area. The CVFCTN field (offset 6 in the CVPL) contains a 1-byte CVAF function code.
- k. Identify the CVAF function keyword corresponding to the value in the CVAF function byte and specify it as the modifier keyword. The possible values of the CVAF function byte and the corresponding function keywords are shown in the following table:

Figure 26. CVAF Function Byte Values in the CVPL		
Value of CVAF Function Byte	Function Keyword	Subfunction Keyword
01 (X'01')	DS	—
02 (X'02')	DS	—
03 (X'03')	DS	—
04 (X'04')	DS	—
05 (X'05')	DS	—
06 (X'06')	IX	ADD
07 (X'07')	IX	DEL
08 (X'08')	DM	—
09 (X'09')	DM	—
10 (X'0A')	DM	—
11 (X'0B')	VO	—
12 (X'0C')	VR	—
13 (X'0D')	VR	—
14 (X'0E')	FI	—
15 (X'0F')	FI	—
16 (X'10')	FI	—

See “Table of CVAF Functions” on page 86 for a detailed description of the operations performed by the CVAF functions.

- l. A previous VTOC or index update may have caused the present problem. Use IEHLIST to obtain a listing of the contents of the VTOC and the VTOC index. To list the index, specify INDEXDSN = SYS1.VTOCIX.Vnnnnnn, where nnn is the name of your VTOC index.
- m. Turn to “Component Identification Keyword” on page 105.

Message Failure Modifier Keywords Procedure

1. Using the module name determined at "DADSM/CVAF—Module Keyword" on page 64, locate that module name in either "DADSM Module-to-Function Cross-Reference" or "CVAF Module-to-Function Cross-Reference" in the related publication *MVS/DFP: Diagnosis Reference* to determine any applicable modifier (function and subfunction) keywords.

Example: If the module name is **IGG0325B**, specify the modifier keywords as shown:

```
ALLOC NONIALL
```

2. Turn to "Component Identification Keyword" on page 105.

DASD Common Services—Modifier Keywords

Use this section to build the modifier keywords for DASD common services. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area.

Procedure

Use the following fields in the problem determination area (PDA) as modifier keywords except for common filter services, which neither employs an ESTAE nor uses a PDA.

- Failure-related module
- Most recent calling function
- Return code
- Reason code.

The failure-related ISPF log entry's FEEDBACK field contains the PDA information. See the first entry in the sample ISPF log in "ISMF Diagnostic Aids" in the related publication *MVS/DFP: Diagnosis Reference* for a sample entry containing PDA information. See "DASD Common Services—Problem Determination Area (PDA)" in the same publication for a description of the PDA contents.

1. Specify the contents of the PDA fields as modifier keywords.

Example: If the module name is **IGBDIS01**, the return code is **10**, and the reason code is **038** (as shown in the first entry in the sample ISPF log in "ISMF Diagnostic Aids"), specify the modifier keywords as shown:

```
IGBDIS01 RC10 RC038
```

2. Turn to "Component Identification Keyword" on page 105.

ISMF—Modifier Keywords

Use this section to build the modifier keywords for ISMF. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area.

Procedure

ISMF uses an entry in the ISPF log data set to record information that can help in diagnosing a problem. See “ISMF’s Use of the ISPF Log” in the related publication *MVS/DFP: Diagnosis Reference* for a description of the ISPF log and ISMF logging options.

ISMF also provides the ERTB command, which displays failure symptoms that you can specify as search keywords. See the sections “Using the Logging/Abend Control Entry Panel” and “Using the ERTB Display Panel” in the “ISMF—Diagnostic Aids” portion of the related publication *MVS/DFP: Diagnosis Reference* for details.

1. You can use the contents of the following ISPF log entry fields as modifier keywords:
 - Application identifier
 - Function identifier
 - Module name
 - Procedure identifier
 - Last panel identifier
 - Service
 - Feedback
 - Return code
 - Reason code
2. If you can relate a log entry to the error, use Figure 27 on page 92 to determine which log information to specify as modifier keywords.
 - For abend failures, specify the module you determined at “ISMF—Module Keyword” on page 67 as the module name keyword.
 - For message-indicated failures, specify the return code and reason code you determined at “ISMF—Message Keyword” on page 42 as modifier keywords. (Specify them exactly as the system presented them.)

Figure 27. ISMF—Information Needed to Build the Modifier Keywords

Type-of-Failure	Modifier
Abend	Application identifier Function identifier Last panel
Message	Application identifier Function identifier Module identifier Procedure Last panel Service Feedback Return code Reason code
Incorrect Output	Application identifier Function identifier Return code Reason code Last panel
Wait/Loop	Application identifier Function identifier Return code Reason code Last Panel
Performance	Application identifier Function identifier Return code Reason code Last panel Service Feedback

3. If you cannot relate an ISPF log entry to the failure (incorrect output, wait, or loop types-of-failure), use Figure 28 to determine which modifier keywords to specify.

Figure 28. ISMF—Modifier Keywords to Use When the Log Is Not Available

Failing Function	Keyword
Primary Option Menu	MAIN DLG
Profile	PROFILE
Application selection	SELECT
Initializing an application	INIT
Displaying a list	DISPLIST
Line operators	Line operator name
Commands	Command name
Exiting ISMF	TERM

4. Continue at “Adding Modifiers to the Keyword String” on page 93.

Adding Modifiers to the Keyword String

1. Specify (in any order) the appropriate modifiers as keywords.

The sample log entry in Figure 29 illustrates a **message-indicated** failure. After specifying **MSGDGTDS004** as the type-of-failure keyword, specify the values listed after the applicable labels (as identified in Figure 27 on page 92). The application modifier keyword is **DATA SET**.

```
***** ISMF ERROR ***** - APPLICATION(DGT1 - DATA SET); FUNCTION(SELECT)
                             - RETURN CODE(0008); REASON CODE(0006)
                             - MODULE(DGTFDS03); PROCEDURE(GENAARAY)
                             - MESSAGE ID(DGTDS004 - DGTS004); LAST PANEL(DGTDDDS1)
                             - SERVICE(DGTFDS04); FEEDBACK(NONE)
```

Figure 29. ISMF—Sample ISMF Entry in ISPF Log

2. To add modifier keywords to the keyword string, use **only** the significant log entry field values as keywords, ignoring any fields containing duplicate values. For example, specify the keyword string for the log entry sample in Figure 29 as follows:

```
MSGDGTDS004 DATA SET SELECT RC8 RC6 DGTFDS03 GENAARAY DGTDDDS1 DGTFDS04
```

3. Turn to "Component Identification Keyword" on page 105.

Media Manager—Modifier Keywords

Use this section to build the modifier keyword (function) for the media manager. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area.

Two procedures follow; the first is for **abend**, **wait**, or **loop** types-of-failure; the second is for identifying a probable failing function if the first procedure does not, or if the failure is other than an abend, wait, or loop.

Abend/Wait/Loop Modifier Keyword Procedure

To determine the failing media manager function, use the following procedure to locate the calling program and identify the type of call.

1. Use the dump obtained earlier for either the abend or wait/loop type-of-failure.
2. Register 13 at the time of the abend points to the save area of the media manager's caller. Standard save area conventions are followed. Linkage to media manager is via registers 14 and 15. Parameters are passed in registers 0, 1, and 2.
3. Locate in the dump the save area pointed to by register 13. Locate register 14 in the save area; it points to the calling program's next sequential instruction following the instruction that called media manager.
4. Locate in the dump the instruction in the calling program that passed control to media manager. The instruction is similar to the one shown:

Machine	Assembler	
Language	Language	
Instruction	Instruction	Usage
440E044A	EX 0,1098(14)	(Common for all linkages)

5. Trace backward from that instruction, looking for the following sequence of linkage instructions:

Machine	Assembler
Language	Language
Instruction	Instruction
58E00010	L 14,16(0)
58F0E148	L 15,328(,14)
58F0F010	L 15,16(,15)

6. One of the instructions shown in Figure 30 follows this sequence of instructions. It identifies the media manager function invoked by the caller.

Figure 30 (Page 1 of 2). Identifying the Media Manager Function Invoked		
Machine Language Instruction	Assembler Language Instruction	Modifier (Function) keyword
58F0F008	L 15,8(,15)	INIT
58F0F00C	L 15,12(,15)	RDWR

Figure 30 (Page 2 of 2). Identifying the Media Manager Function Invoked

Machine Language Instruction	Assembler Language Instruction	Modifier (Function) keyword
58F0F010	L 15,16(,15)	FMTWR
58F0F014	L 15,20(,15)	PFMT
58F0F018	L 15,24(,15)	CNVT (RBA TO CCHHR)
58F0F01C	L 15,28(,15)	CNVT (CCHHR TO RBA)
58F0F020	L 15,32(,15)	SRV

Note: Because I/O and program processing are asynchronous, the most recent program activity may not involve a media manager call. However, by looking for these linkage instructions, you can locate the most recent media manager calls to the INIT, CNVT, or SRV functions.

- Specify the media manager function as the modifier keyword.

Example: If the function is **CNVT**, specify the keyword as follows:

CNVT

- If the function is neither **INIT**, **CNVT**, nor **SRV**, continue with this process. Otherwise, turn to "Component Identification Keyword" on page 105.
- The function must be either **RDWR**, **FMTWR**, or **PFMT**. Continue with this procedure.
- If functional recovery routines are in effect and a program check or abnormal termination occurs either in the media manager or in an exit routine from the media manager, the system automatically directs a summary dump of media manager control blocks to the SYS1.DUMPxx data set.

When printing a dump from a SYS1.DUMPxx data set, print at least the summary dump portion of the dump, using the IPCS dump formatter (see the publication *Interactive Problem Control System (IPCS) User's Guide* for details on using this service). If ICYFRR issued the SDUMP, use the sample media manager dump in "Media Manager Diagnostic Aids" in the related publication *MVS/DFP: Diagnosis Reference* for the following steps.

- Locate in the dump the media manager process block (MMPB). It is near the beginning of the summary dump, and the acronym MMPB in EBCDIC representation appears at offset 0 in the MMPB itself.

If you cannot locate the media manager process block this way, use the following procedure:

- Locate the MMVT via the CVTMMVT field in the CVT and look for the first storage vector MMSV via the eyecatcher **ICYMMSV1**. See the sample media manager dump in "Media Manager Diagnostic Aids" in the related publication *MVS/DFP: Diagnosis Reference*.
- Each 2-word MMSV entry following the eyecatcher consists of a lockword (unused or caller's ASID) followed by a pointer to the media manager storage block containing the MMPB(s). Multiple MMPBs exist, some of which are active and some inactive; to find the one that may be

related to the failure, examine the MMPASID and MMPBPARM fields for the ASID and input parameters, respectively.

- The MMPFLG2 field in the MMPB is a 1-byte field that identifies which media manager function was in control:

MMPFLG2 Value	Modifier (Function) Keyword
X'08'	PFMT
X'10'	FMTWR

If neither value is present, the function, by default, is **RDWR**.

Example: If the function is **PFMT**, specify the modifier keyword as shown:

PFMT

- Turn to "Component Identification Keyword" on page 105.

Alternate Modifier Keyword Procedure

Use this procedure if the previous procedure has not isolated the failing media manager function, or if the type-of-failure is other than abend, wait, or loop.

Function keywords divide the media manager into logical areas. A unique acronym identifies each of these functions.

- From the following list, select the modifier (function) keyword that describes the area you suspect of failure.

Function	Description
CNVT	Converts relative byte addresses to absolute device addresses (CCHHR), and vice versa. The CNVT function uses modules ICYCCHHR and ICYRBA.
FMTWR	Processes requests to format and write tracks sequentially. The FMTWR function uses modules ICYABN, ICYABN, ICYBLDCP, ICYBLIST, ICYDIE, ICYFW, ICYNRM, ICYPGAD, ICYRBA, and ICYSTOR.
INIT	Initializes the media manager control blocks. The INIT function uses modules ICYIEDB, ICYILPMB, and ICYINIT.
MMSYSTEM	Manages media manager resources. The MMSYSTEM function uses modules ICYELE, ICYFRR, and ICYPURG.
PFMT	Processes requests to preformat tracks within a range of relative byte addresses. The PFMT function uses modules ICYCCHHR, ICYPCFP, ICYPFMT, ICYRBA, ICYSTOR, ICYPFDIE, and ICYPFAPP.
RDWR	Processes requests to read or write the data portion of records. The RDWR function uses modules ICYABN, ICYBLDCP, ICYBLIST, ICYDIE, ICYNRM, ICYPGAD, ICYRBA, ICYRDWR, ICYSORT, and ICYSTOR.

SRV Set of functions which interface with the integrated catalog facility catalog to obtain data set information and to update that information when explicitly requested. The SRV function uses modules ICYMMSRV and ICYMSTAE.

2. Specify the modifier keyword as shown:

FMTWR

3. Turn to "Component Identification Keyword" on page 105.

Open/Close/End of Volume (Common)—Modifier Keywords

Use this section to build the modifier keywords for common open/close/end of volume. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area.

Procedure

1. Except for the first load modules of common open/close/end of volume functions (listed below), the first three characters of most module names are **IFG**, and the fourth through sixth characters of the module name identify the function. Select a function from the following two lists:

Module Name 1-6	Function Keyword
IFG019	OPEN
IFG020	CLOSE
IFG023	TCLOSE
IFG055	EOV
IFG0RR	RECOVERY
IFG0TC	TERMINATION

List of First Load Modules

Module Name	Function Keyword
IGC0001I	OPEN
IGC00020	CLOSE
ICG0002C	TCLOSE
IGC0005E	EOV
IGC0002B	OPENJ
IGC0003A	FEOV (force end of volume)

Example: If the function is **OPEN**, specify the modifier keyword as shown:

OPEN

2. Turn to “Component Identification Keyword” on page 105.

SMS—Modifier Keywords

Use this section to build the modifier keywords for the Storage Management Subsystem. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area.

If SMS issues either message **IGD300I** or **IGD306I**, use the SUMDUMP or SYS1.LOGREC information respectively to identify failure-related modifier keywords.

Procedure

1. Specify modifier keywords based on the failure-related SMS function or process. Use the following tables to identify any applicable keywords. Record them on the “Keyword Worksheet” on page 6 as modifier keywords.

Figure 31. SMS General Keywords

Keyword	Failure-Related Command
AVGREC	N/A
DATACLAS	N/A
DEVSERVSMS	Operator command 'DEVSERV SMS'
DISPLAYSMS	Operator command 'DISPLAY SMS'
KEYLEN	N/A
KEYOFF	N/A
LIKE	N/A
MGMTCLAS	N/A
REFDD	N/A
SECMODEL	N/A
SETSMS	Operator command 'SETSMS'
SETSMSEQ	Operator command 'SET SMS='
SMSDATA	IPCS verbexit 'SMSDATA'
STORCLAS	N/A
STORGRP	N/A
VARY	Operator command 'VARY' (not 'VARY SMS')
VARYSMS	Operator command 'VARY SMS'

ACS Routine Related Keywords

For problems involving ACS routine execution, specify as keywords any applicable variables and statements from the following table.

Example: If the variable is **ACSENVIR**, specify the keyword as shown:

ACSENVIR

Figure 32. ACS Variable and Statement Keywords

ACSENVIR	LLQ
ALLVOL	MAXSIZE
ANYVOL	MSVGP
APPLIC	NQUAL
DSN	NVOL
DSORG	PGM
DSOWNER	RECORD
DSTYPE	RETDT
EXPDT	SELECT
FILTLIST	SET
GROUP	WRITE
HLQ	XMODE

SMS Resource Name Keywords

For problems related to serialization of SMS resources, specify the applicable resource name(s) from the following table.

Example: If the major resource name is **SYSZIGDI** and the minor resource name is **SMS VECTOR TABLE**, specify the keywords as shown:

SYSZIGDI SMS VECTOR TABLE

Major Name	Minor Name
IGDCDS	N/A
IGDCDSXS	N/A
SYSZIGDI	ICMRT CMDSADDR LOCKED
SYSZIGDI	IGDSSI00
SYSZIGDI	IGDSSI01
SYSZIGDI	SMS VECTOR TABLE
SYSZIGWO	N/A

2. Turn to "Component Identification Keyword" on page 105.

VSAM—Modifier Keywords

VSAM Catalog Management—Modifier Keywords

Use this section to build the modifier keywords for the failure-related VSAM catalog management component. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to isolate a specific problem area. The keywords identify:

- The type of catalog being used
- Failure-related access method services commands
- Internal VSAM catalog management functions.

The catalog management components are:

- Integrated catalog and VSAM catalog.
- CVOL and VSAM catalog only.
- Access method services.

Procedure

1. From the following list, select the keywords that describe the type of catalog in use at the time of failure. (More than one may be applicable.)

Figure 33. List of Failure-Related Catalog Types

CVOLCAT
ICFCAT
MASTCAT (or MCAT)
USERCAT (or UCAT)
VSAMCAT

2. From the following modifier keyword list, select the keyword that identifies the area in which you suspect the failure occurred.

Figure 34. List of Failure-Related Access Method Services Commands

ALLOCATE	DELETE
ALTER	DIAGNOSE
BINDDATA	EXAMINE
BLDINDEX	EXPORT
CHKLIST	EXPORTRA
CNVTCAT	IMPORT
DEFINE ALIAS	IMPORTRA
DEFINE ALTERNATE INDEX	LISTCAT
DEFINE CLUSTER	LISTCRA
DEFINE GDG	LISTDATA
DEFINE MASTERCATALOG	PRINT
DEFINE NONVSAM	REPRO
DEFINE PAGESPACE	RESETCAT
DEFINE PATH	SETCACHE
DEFINE SPACE	VERIFY
DEFINE USERCATALOG	

Example: If the failure occurred while you were executing the **DEFINE USERCATALOG** command, specify the modifier keywords as shown:

```
DEFINE USERCATALOG
```

3. Turn to "Component Identification Keyword" on page 105.

Nonspecific MVS/DFP Components—Modifier Keywords

Use this section to build the modifier keywords for MVS/DFP components for which no unique procedure exists. The modifier keywords are optional, but **may be necessary** to restrict the scope of a software data base search to a reasonable number of matches. Use them to identify a specific problem area. They may identify a function, command name, register name, register contents, and so forth.

Procedure

1. Scan the list of standard modifier keywords at "Modifier Keywords" on page 79 and specify any that apply to the failure.
2. Specify the function, command name, or other modifier as it is spelled in a message, manual, or other identifying material.
3. Turn to "Component Identification Keyword" on page 105.

Component Identification Keyword

Use this section to identify the suspected failing MVS/DFP component in your keyword string.

1. Use the following table to determine the component identification keyword for the component you suspect of failure. Specify the entire 9-digit component identification shown in the table as the keyword.

Note: For **VSAM catalog-related failures** you should construct two keyword strings because a problem could exist in a module that services both types of catalogs. The first string should specify the component ID **566528418** and the second should specify **566528420**.

2. Turn to "Release Level Keyword" on page 109.

Figure 35 (Page 1 of 2). Components by Component Name

Component Name	Component Identification Keyword
Access Method Services	566528430
AMBLIST	566528412
Asynchronous Operations Manager	566528465
BMF	566528464
CDM	566528466
Checkpoint/Restart	566528424
Cond Asm Sw	566528410
CVAF	566528425
CVOL and VSAM Catalog only	566528420
DADSM	566528417
BDAM	566528416
DASD ERPS	566528402
Device Cons Services	566528463
DASD Common Services	566528460
ICAPRTBL	566528435
IEBCOMPR	566528443
IEBCOPY	566528446
IEBDG	566528442
IEBEDIT	566528449
IEBGENER	566528447
IEBIMAGE	566528444
IEBISAM	566528441
IEBTPCH	566528437
IEBUPDTE	566528448
IEHINITT	566528438
IEHLIST	566528405
IEHMOVE	566528407

Figure 35 (Page 2 of 2). Components by Component Name

Component Name	Component Identification Keyword
IEHPROGM	566528406
IFHSTATR	566528439
IMF	566528469
Integrated Catalog Facility and VSAM Catalog	566528418
ISAM	566528434
ISMF	566528461
JCLM	566528467
Linkage Editor	566528408
Loader	566528411
Media Manager	566528415
Object Access Method	566528481
Open/Close/End of Volume	566528413
Overlay Supervisor	566528426
PAM	566528422
Password Protect	566528421
Program Fetch	566528428
SAM	566528414
SAM Subsystem Interface	566528429
SGIEH402	566528445
SIO Exits	566528427
SSF	566528470
Storage Management Subsystem	566528462
Sysgen	566528404
Tape ERPS	566528401
TSO Link/Load/Go	566528409
TSO Utility Interface	566528436
Unit Record ERPS	566528403
VIO/VBP	566528423
VSAM Block Processor	566528419
VSAM O/C/EOV	566528451
VSAM Record Management	566528452
3505/3525 Reader/Punch	566528431
3800 Offline Utility	566528450

Figure 36 (Page 1 of 2). Components by Component Identifier

Component Identification Keyword	Component Name
566528401	Tape ERPS
566528402	DASD ERPS
566528403	Unit Record ERPS
566528404	Sysgen
566528405	IEHLIST
566528406	IEHPROGM
566528407	IEHMOVE
566528408	Linkage Editor
566528409	Link/Load/Go
566528410	Cond Asm Sw
566528411	Loader
566528412	AMBLIST
566528413	Open/Close/End of Volume
566528414	SAM
566528415	Media Manager
566528416	BDAM
566528417	DADSM
566528418	Integrated Catalog Facility and VSAM Catalog
566528419	VSAM Block Processor
566528420	CVOL and VSAM Catalog only
566528421	Password Protect
566528422	PAM
566528423	VIO/VBP
566528424	Checkpoint/Restart
566528425	CVAF
566528426	Overlay Supervisor
566528427	SIO Exits
566528428	Program Fetch
566528429	SAM Subsystem Interface
566528430	Access Method Services
566528431	3505/3525 Reader/Punch
566528434	ISAM
566528435	ICAPRTBL
566528436	TSO Utility Interface
566528437	IEBPTPCH
566528438	IEHINITT
566528439	IFHSTATR
566528441	IEBISAM
566528442	IEBDG

Figure 36 (Page 2 of 2). Components by Component Identifier	
Component Identification Keyword	Component Name
566528443	IEBCOMPR
566528444	IEBIMAGE
566528445	SGIEH402
566528446	IEBCOPY
566528447	IEBGENER
566528448	IEBUPDTE
566528449	IEBEDIT
566528450	3800 Offline Utility
566528451	VSAM O/C/EOV
566528452	VSAM Record Management
566528460	DASD Common Services
566528461	ISMF
566528462	Storage Management Subsystem
566528463	Device Cons Services
566528464	BMF
566528465	Asynchronous Operations Manager
566528466	CDM
566528467	JCLM
566528469	IMF
566528470	SSF
566528481	Object Access Method

Release Level Keyword

Use the following procedure to determine the release level keyword for the failure-related MVS/DFP module on your system.

By specifying the release level keyword in your keyword string, you limit the software data base search to problems reported against that specific version and release.

Note: While this may reduce the number of matches against your keyword string, it may inadvertently eliminate the software record you hoped to find, because the problem may have been reported against an earlier release. Use "Techniques for Varying the Search Argument" on page 5 to avoid this.

Procedure

Use one of the following methods to obtain the MVS/DFP release level keyword:

- Method A—Using SMP/E (requires knowing the module name)
- Method B—Using the Module Copyright Area (requires knowing the module name and having a dump containing the module)

If you cannot determine the module name, bypass this procedure and turn to "Searching with the Keyword String" on page 3.

Method A—Using SMP/E

If you suspect a specific module of causing the problem, you can use this procedure to determine the version and release level of DFP.

1. List the consolidated software inventory (CSI), using the following SMP/E control statements:

```
SET BDY (tgtzone).  
LIST MOD (name) XREF.
```

Note: Be sure to include the *period* at the end of the control statements.

2. In the **NAME** column of the CSI, locate the name of the module causing the problem.
3. In the entry for the module, find the **FMID** field. The three low order digits in the FMID field constitute the basis for the release level keyword. Append them to the keyword prefix **R**.

Example: If the three digits are **320**, specify the release level keyword as shown:

```
R320
```

4. Turn to "Service Level Keyword" on page 111.

Note: For more details on using this procedure, see the publication *SMP/E User's Guide*.

Method B—Using the Module Copyright Area

1. Locate the module in the dump by scanning the EBCDIC portion in the address range associated with the failure-related module. The first part of the module contains the following:
 - Copyright statement
 - Module name
 - FMID
 - Service level (PTF#) of the module
2. In the copyright area, find the **FMID** field. The three low order digits in the FMID field constitute the basis for the release level keyword. Append them to the keyword prefix **R**.

Example: If the three digits are **320**, specify the release level keyword as shown:

R320

3. Turn to "Service Level Keyword" on page 111.

Service Level Keyword

Use this procedure to determine the service level of a DFP module installed on your system. The service level of a module is defined as the most current fix applied to that module. It may be any one (but only one) of the following:

- The highest level APAR fix applied to a module.
- The highest level PTF fix applied to a module.
- The FMID of the DFP product to which a module belongs (if no fixes have been applied to the module).

The service level keyword is optional in the keyword string, but is required when communicating with the IBM Support Center.

Use this keyword to identify any recently applied software service (APARs or PTFs) that seems to be failure-related.

Procedure

Use one of the following methods to obtain the service level of a DFP module:

- Method A—Using SMP/E
- Method B—Using the Module Copyright Area
- Method C—Using the SDUMP Title Page

Notes:

1. The service level is normally adjacent to the module name in a dump.
2. If the failure-related module resides in the Modified Link Pack Area (MLPA), specify *its* service level as the keyword.

Method A—Using SMP/E

List the appropriate target zone of the CSI. The control statements are:

```
SET BDY (tgtzone).  
LIST MOD (name) XREF.
```

where *tgtzone* is the target zone and *name* is the module name.

1. Using the output listing, locate the name of the failure-related module in the **NAME** column of the CSI.
2. In the entry for that module, locate the replacement module identifier (RMID) field. The RMID field contains one of the following:
 - An APAR number
 - A PTF number
 - The FMID of the DFP product of which the module is a part (if no fixes have been applied to the module).

Note: You can also determine a module's service level by using the SMP/E query dialog. For more information, see the publication *SMP/E User's Guide*.

3. To determine whether a specific PTF is installed on your system without knowing what modules it affects, use your installation’s SMP procedure as follows:

Using **SMP/E**, list the **SYSMODs**; the control statement is:

```
SET BDY (tgtzone).  
LIST SYSMOD (ptf#).
```

Note: For more details on using this procedure, see the publication *SMP/E User’s Guide*.

4. Specify the service level keyword.

Example: If the service level of the failure related module is **UY12345**, specify the service level keyword as shown:

```
UY12345
```

5. Turn to “Searching with the Keyword String” on page 3.

Method B—Using the Module Copyright Area

1. Locate the service level in the copyright information at the beginning of the failure-related CSECT.
2. Specify the service level keyword.

Example: If the service level of the failure related module is **UY12345**, specify the service level keyword as shown:

```
UY12345
```

3. Turn to “Searching with the Keyword String” on page 3.

Method C—Using the SDUMP Title Page

1. Locate the service level in the SDUMP header title.
2. Specify the service level keyword.

Example: If the service level of the failure related module is **UY12345**, specify the service level keyword as shown:

```
UY12345
```

3. Turn to “Searching with the Keyword String” on page 3.

Contacting the IBM Support Center for Assistance

Procedure

Contact the IBM Support Center for assistance in gathering additional documentation. Be prepared to supply the following information:

- The keyword string (or strings) that you have built
- Customer number
- Current release level
- Current service level (list of APARs and PTFs applied)
- Processor number (type, model, serial)
- Your program update tape level

Abbreviations

The following abbreviations are defined as they are used in the MVS/DFP library. If you do not find the abbreviation you are looking for, see *Dictionary of Computing*, SC20-1699.

This list includes acronyms and abbreviations developed by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). This material is reproduced from the *American National Dictionary for Information Processing*, copyright 1977 by the Computer and Business Equipment Manufacturers American National Standards Institute, 1430 Broadway, New York, New York 10018.

A

ABEND. Abnormal end.

ABP. Actual block processor (either the IOM module IDA121A2 or the IOM communication vector table).

ACB. Access method control block.

ACDS. Active control data set.

ACDS (SMP). Alternate control data set (a data set used by SMP).

ACS. Automatic class selection.

adcon. Address constant.

ADDR. Addressed processing.

ADR. Same as ADDR.

AIX. Alternate index.

AL. American National Standard Labels.

AMBL. Access method block list.

AMBXN. Access method block extension.

AMDSB. Access method data statistics block.

AMODE. Addressing mode.

AOM. Asynchronous Operations Manager.

APAR. Authorized program analysis report.

APF. Authorized program facility.

ARDB. Address range definition block.

ASCB. Address space control block.

ASCII. American National Standard Code for Information Interchange.

ASI. Asynchronous interrupt.

AUTOTBL. Storage table (access method services).

AVT. Appendage vector table.

B

BCB. Buffer control block.

BCDIC. Binary coded decimal interchange code.

BCS. Basic catalog structure.

BDW. Block descriptor word.

BIB. Base information block.

BLPRM. Resource pool parameter list.

BMF. Buffer management facility

bpi. Bits per inch.

BPI. Bytes per inch.

BSPH. Buffer subpool header.

BUFC. Buffer control block.

BWD. Backward (processing).

C

C. Close.

CA. Control area.

CAS. Catalog address space.

CAXWA. Catalog auxiliary work area.

CBIC. Control blocks in common.

CBUF. Control block update facility.

CCA. Catalog communication area.

CCB. CVAF common block.

CCHHR. Cylinder/head record address.

CCR. Catalog control record.

CCW. Channel command word.

CCX. Catalog communication area extension.

CDE. Contents directory element.

CDS. Control data set.

CDM. Common data manager

CESD. Composite external symbol dictionary.

CFS. Common filter service.

CHKPT. Checkpoint.

CHR. Checkpoint header record.

CI. Control interval.

CICB (Catalog management). Catalog integrity control block.

CICB (SAM). JES compatibility interface control block.

CIDF. Control interval definition field.

CIFWA. CAS interface work area.

CIPT. Control interval pointer table.

CISA. Catalog integrity save area.

CIST. Control interval substitution table.

CKDS. Cryptographic key data set.

CLW. Close work area (VSAM - mapped by IDACLWRK).

CLWA. Close work area (common OPEN/CLOSE/EOV).

CNV. Control interval or control-interval processing.

COMMDS. Communications data set.

CPA. Channel program area.

CPL. Catalog parameter list.

C/R. Checkpoint/restart.

CRA. Catalog recovery area.

CRT. CAS resource table.

CSA. Common service area.

CSI. Consolidated software inventory (a data set used by SMP/E).

CSL. Core save list.

CSW. Channel status word.

CTC. Channel to channel

CTGFL. Catalog field parameter list.

CTGFV. Catalog field vector table.

CTGPL. Catalog parameter list.

CTGVL. Catalog volume list.

CTGWA. Catalog work area.

CVAF. Common VTOC access facility.

CVOL. Control volume.

CVPL. CVAF parameter list.

CVT. Communication vector table.

D

DADSM. Direct access device space management.

DASD. Direct access storage device.

DAT. Dynamic address translation.

DB2. IBM Database 2

DB2I. IBM Database 2 Interactive

DCB. Data control block.

DCBD. Data control block dummy section.

DCE. Device class extension.

DCS. DASD calculation services.

DD. Data definition.

DDNT. Ddname table.

DEB. Data extent block.

DECB. Data event control block.

DES. Data Encryption Standard.

DFDSS. Data Facility Data Set Services.

DFHSM. Data Facility Hierarchical Storage Manager.
DFP. Data Facility Product.
DIE. Disabled interrupt exit.
DIR. Direct processing.
DIRF. DADSM interrupt recording facility.
DIS. device information services.
DIWA. Data insert work area.
DOC APAR. An authorized program analysis report produced for a documentation problem.
DOS. Disk operating system.
DSAB. Data set association block.
DSDR. Data set descriptor record.
DSECT. Dummy control section.
DSL. Data extent block save list.
DSORG. Data set organization.
DSPE. Data set pointer entry.
DTT. Define tracking table.
DVCT. Device characteristics table.

E

ECB. Event control block.
ECKD. Extended count-key data.
ECSA. Extended common service area.
EDB. Extent definition block.
EDT. Eligible device table.
ELPA. Extended link pack area.
ENDREQ. End the request.
ENF. Event notification facility.
EOB. End of block.
EOD. End-of-data.
EOKR. End-of-key range.
EOM. End-of-module.

EP. External procedure entry point.
E/P. Entry point.
EPA. Entry point address.
EPCB. EXCP purge control block.
EPLPA. Extended pageable link pack area.
ERFLG. Error flags.
ERP. Error recovery procedure.
ESDID. External symbol dictionary identification.
ESDS. Entry-sequenced data set.
ESL. Enqueue save list.
ESQA. Extended system queue area.
ESTAE. Extended specify task abnormal exit.
EUNLD. Unload parameter list.
EWS. Early warning system.
EXCD. Exceptional conditions.
EXLST. Exit list.

F

F. Fixed (used to describe record format).
FBQE. Free block queue element.
FCB. Forms control buffer.
FCL. Filter criteria list.
FDT. Function data table (access method services).
FILTLIST. Filter list.
FIPS. Federal Information Processing Standard.
FKS. Full key search.
FLIH. First level interrupt handler.
FLPA. Fixed link pack area.
FMID. Function modification identifier.
FOE. Fixed ownership element.
FPL. Catalog field parameter list.
FQE. Free queue element.

FRR. Functional recovery routine.

FS. Free space.

FSR. Function support routine (access method services).

FVT. Catalog field vector table.

FWD. Forward (processing).

G

GAT. Generation aging table.

GC. Type code (group code).

GCR. Group coded recording.

GDG. Generation data group.

GDGNT. Generation data group name table.

GDS. Generation data set.

GDT. Global data table (access method services).

GEN. Generic key search.

GIPE. Generation index pointer entry.

GRS. Global resource serialization.

GSR. Global shared resources.

GTF. Generalized trace facility.

H

HA. Home address.

HEB. Header element block.

HSM. Data Facility Hierarchical Storage Manager

I

ICB. Interrupt control block.

ICE. Index control entry.

ICIP. Improved control-interval processing.

ICKDSF. Device Support Facilities.

ICWA. Index create work area.

IDAL. Indirect data-address list (real page list).

IDAX. SMS interpreter/dynamic allocation exit.

II. ISAM Interface.

IICB. ISAM interface control block.

ILE. Index link entry.

IMF. Index management facility

IMWA. Index modification work area.

IOB. Input/output block.

IOGEN. I/O device generation.

IOM. I/O management.

IOMB. I/O-management block.

IOMBXN. I/O management block extension.

IOS. I/O supervisor.

IOSB. I/O supervisor block.

IPE. index pointer entry.

IQE. Interrupt queue element.

IRB. Interrupt request block.

IRF. Interrupt recognition flag.

IRG. Interrecord gap.

ISCI. International Standard Code for Information Interchange.

ISMF. Interactive Storage Management Facility.

ISO. International Organization for Standardization.

ISPF. Interactive System Productivity Facility.

J

JCT. Job control table.

JESCT. Job entry subsystem control table.

JFCB. Job file control block.

JFCBE. Job file control block extension.

JSCB. Job step control block.

JSTCB. Job step task control block.

K

K. Kilobyte

KEQ. Search on key equal.

KSDS. Key-sequenced data set.

L

L. Link.

LCS. Library control system

LD. Label definition.

LDS. Linear data set.

LLE. Load list element.

LLOR. Least length of record (that contains all key fields).

LPA. Link pack area.

LPALIB. Link pack area library.

LPMB. Logical-to-physical mapping block.

LR. Label reference.

LRI. Logical record interface.

LSQA. Local system queue area.

LSR. Local shared resources.

M

MACR. Macro reference.

MBBCCHHR. Module#, bin#, cylinder#, head#, record#.

MBCB. Main SVRB pool control block.

MLA. Multilevel alias facility.

MLPA. Modified link pack area.

MMIB. Media manager interface block.

MMPB. Media manager process block.

MMPT. Media manager purge table.

MMRE. Media manager request element.

MMSB. Media manager storage block.

MMSV. Media manager storage vector.

MMVT. Media manager vector table.

MOD. Module.

MSS. Mass Storage System.

MSVC. Mass Storage Volume Control.

MSVI. Mass storage volume inventory.

MVS. Multiple virtual storage

N

n. Integer number.

NIP. Nucleus initialization program.

NRZI. Nonreturn-to-zero inverted.

NSI. Next sequential instruction.

NSL. Nonstandard label (a label option for magnetic tape devices).

NSP. Next string position.

NUP. No update.

NVR. Non-VSAM volume record.

O

O. Open.

OAM. Object Access Method

O/C/EOV. Open/close/end-of-volume.

OCO. Object code only.

OFLG. Open flags.

OPTCD. Option code.

OPW. Open work area (VSAM—mapped by IDAOPWRK).

OPWA. Common O/C/EOV work area.

OPWRK. VSAM O/C/EOV ACB work area (mapped by IDAOPWRK).

OS CVOL. Operating system control volume.

P

P pointer. Position pointer.

PC. Private code.

PCB. Page control block.

PCCB. Private catalog control block.

PCI. Program-controlled interruption.

PCTT. Private catalog termination table.

PDA. Problem determination area.

PDAB. Parallel data access block.

PDS. Partitioned data set.

PDSCB. Partial data set control block.

PDSE. Partitioned data set extended.

PE. Phase encoded.

PERFM. Type-of-failure keyword for performance problem.

PFL. Page fix list.

PFPL. PGFIX parameter list (same as PFL).

PIOD. Problem-state I/O driver.

PIRL. Purge I/O restore list.

PLH. Placeholder list.

PLPA. Pageable link pack area.

PO. Partitioned organization.

PPIR. Problem program storage image record.

PQE. Partition queue element.

PR. Pseudo register.

PRB. Program request block.

PROC. Procedure.

PS. Physical sequential organization (used to describe data set format).

PSA. Prefixed save area.

PSB. Protected sphere block.

PSL. Page save list.

PSR. Program Support Representative.

PSW. Program status word.

PVT. Page vector table.

Q

QCB. Queue control block.

QDB. Queue descriptor block.

R

R0. Record zero.

RA. Record area.

RAB. Record area block.

RB. Request block.

RBA. Relative byte address.

RDF. Record definition field.

RDW. Record descriptor word.

RIM. Resource initialization module.

RLD. Relocation dictionary.

R/M. Record management.

RMF. Resource Management Facility.

RMID. Replace module identifier (used by SMP and SMP/E).

RMODE. Residence mode.

Rn. General-purpose register n.

RPLE. Request parameter list extension.

RPG. Report Program Generator.

RPS. Rotational position sensing.

RRDS. Relative record data set.

RRN. Relative record number.

RSECT. Read-only control section.

RTM. Recovery/termination manager.

RTN. Routine.

S

- SAF.** System authorization facility.
- SAMB.** Sequential access method block.
- SCB.** STAE control block.
- SCDS.** Source control data set.
- SCIB.** Search compressed index block.
- SCRA.** Catalog recovery area in system storage.
- SCT.** Step control table.
- SCVT.** Secondary communication vector table.
- SD.** Section definition.
- SDB.** Structured data base.
- SDW.** Segment descriptor word.
- SDWA.** STAE (specify task asynchronous exit) diagnostic work area.
- SEQ.** Sequential or sequential processing.
- SIO.** Start I/O.
- SIO appendage.** Start I/O appendage.
- SIOD.** Supervisor-state I/O driver.
- SIOT.** Step I/O table.
- SIRB.** Supervisor interrupt request block.
- SKP.** Skip sequential processing.
- SLIP.** Serviceability level indication processing.
- SMAS.** Storage management address space.
- SMF.** System management facilities.
- SML.** Storage Management Library.
- SMS.** Storage Management Subsystem.
- SPL.** Service priority list.
- SPQE.** Subpool queue element.
- SQA.** System queue area.
- SQL.** Structured query language
- SRA.** Sphere record area.
- SRB.** Service request block.
- SRM.** System resource manager.
- SRR.** Serially reusable resource.
- SSCR.** Subsystem checkpoint record.
- SSF.** Software Support Facility.
- SSIB.** Subsystem identification block.
- SSL.** (1) Swap save list. (2) Storage Subsystem Library.
- SSOB.** Subsystem option block.
- SST.** Set sector table.
- STAE.** Specify task asynchronous exit.
- STAI.** Subtask ABEND interception.
- STC.** System task control.
- STCB.** Subtask control block.
- STRNO.** Number of RPL strings.
- SUR.** Supervisor record.
- SVC.** Supervisor call.
- SVCLIB.** Supervisor call library.
- SVRB.** Supervisor request block.
- SVT.** Supervisor vector table.
- SWA.** (1) Segment work area. (2) Scheduler work area.
- SYSCTLG.** The data set name of the CVOL catalog.
- SYSDUMP.** System dump.

T

- TCAM.** Telecommunications access method.
- TCB.** Task control block.
- TIOT.** Task I/O table.
- TMP.** Terminal monitor program.
- TQE.** Timer queue element.
- TRC.** Table reference character.
- TTR.** Track record address.

U

U. Undefined (used to describe record format).
UCB. Unit control block.
UCRA. Catalog recovery area in user’s storage.
UCS. Universal character set.
UHL. User header label.
UPD. Update mode.
UPT. Upgrade table.
USASI. USA Standards Institute.
USAR. User security authorization record.
USL. Unscheduled list.
USVR. User security-verification routine.
UTL. User trailer label.

V

V. Variable (used to describe record format).
VAT. Valid AMBL table.
VCB. Volume control block.
VCBPE. Volume control block pointer entry.
VCRCORE. VSAM checkpoint/restart core.
VCRT. VSAM checkpoint/restart table.
VDSCB. Virtual data set control block.
VDSS. VTOC data set services.
VGTT. VSAM global termination table.
VIB. VTOC information block.
VICE. Volume index control entry.
VIER. VTOC index entry record.
VIOT. Valid IOMB table.
VIR. VTOC index record.
VIXM. VTOC index map.
VLSPC. Volume space table.

VMDS. VTOC map of DSCBs.
VMT. Volume mount table.
VPL. Virtual page list.
VPSM. VTOC pack space map.
VRF. VTOC recording facility.
VRP. VSAM resource pool.
VSCR. Virtual storage constraint relief.
VSI. VSAM shared information.
VSL. Virtual subarea list.
VSM. Virtual storage manager.
VSRT. VSAM shared resource table.
VTOC. Volume table of contents.
VVCR. VSAM volume control record.
VVDS. VSAM volume data set.
VWDSWA. VVDS work area.
VVR. VSAM volume record.

W

WAX. Work area for path processing.
WSHD. Working storage header.
WTG. Where-to-go table.
WTO. Write to operator.
WTOR. Write to operator with reply.
WXTRN. Weak external reference.

X

XA. Extended architecture.
XCTL. Transfer control (an Assembler language macro).
XDAP. Execute direct access program.
XLRI. Extended logical record interface.
XPT. Checkpoint.
XPTE. External page table entry.

XREF. Cross reference.

XTRN. External reference.

XSB. Extended status block.

Glossary

The following terms are defined as they are used in the MVS/DFP library. If you do not find the term you are looking for, see *Dictionary of Computing*, SC20-1699.

This list includes acronyms and abbreviations developed by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). This material is reproduced from the *American National Dictionary for Information Processing*, copyright 1977 by the Computer and Business Equipment Manufacturers American National Standards Institute, 1430 Broadway, New York, New York 10018.

A

abnormal end (ABEND). Termination of a task prior to its completion as a result of an error condition that could not be resolved by error recovery facilities during task execution.

absolute address An address that, without further modification, identifies a unique DASD storage location.

access method. A technique for organizing and moving data between main storage and input/output devices.

access method control block (ACB). A control block that links an application program to VSAM or ACF/VTAM.

access method services. A multifunction service program that is used to manage both VSAM and non-VSAM data sets and integrated catalog facility or VSAM catalogs. Access method services is used to define data sets and allocate space for them, convert indexed-sequential (ISAM) data sets to key-sequenced data sets, modify data set attributes in the catalog, reorganize data sets, facilitate data portability between operating systems, create backup copies of data sets and indexes, help make inaccessible data sets accessible, list the records of data sets and catalogs, define and build alternate indexes, and convert OS CVOLs and VSAM catalogs to integrated catalog facility catalogs.

acquire. In Mass Storage System, to allocate space on a staging drive, and to stage the volume table of contents (VTOC) from a cartridge to the staging drive.

ACS installation exit. User-written code, executed after an ACS routine, that provides capabilities beyond the scope of the ACS routine.

ACS routine. A procedural set of ACS language statements. Based on a set of input variables, the ACS language statements generate the name of a predefined SMS class, or a list of names of predefined storage groups, for a data set.

ACS specification statement. One of the source statements of an ACS routine.

activate. To load the contents of a source control data set (SCDS) into SMS address space storage and into an active control data set (ACDS), or to load the contents of an existing ACDS into SMS address space storage. This establishes a new storage management policy for the SMS complex.

activation. The process of making an inactive SMS configuration be the active configuration. This determines how the SMS manages system storage.

active configuration. The most recently activated source control data set (SCDS), which now controls storage management for the SMS complex.

active control data set (ACDS). A VSAM linear data set that contains a copy of the most recently activated configuration (SCDS). All systems in an SMS complex use the configuration contained in the ACDS to manage storage.

actual block processor (ABP). A program that formats I/O requests for processing by the I/O supervisor (may be either the IOM module IDA121A2 or the IOM communication vector table).

actual extent. An area in the DEB containing data that describes the space occupied by an extent of a data set. BDAM module IGG0193A builds one actual extent for each extent in the data set.

addressed-direct access. In systems with VSAM, the retrieval or storage of a data record identified by its relative byte address, independent of the record's location to the previously-stored record. See also *addressed-sequential access*, *keyed-direct access*, and *keyed-sequential access*.

addressed-sequential access. In systems with VSAM, the retrieval or storage of a data record in its entry sequence relative to the previously retrieved or stored record. See also *addressed-direct access*, *keyed-direct access*, and *keyed-sequential access*.

addressing mode (AMODE). An attribute of an entry point in a load module that identifies the addressing range in virtual storage which the module is capable

of addressing. Below the 16-megabyte line, only 24-bit addresses can be used.

aggregate group. An SMS construct that uses control information and data set lists to define an application. The data stored is the principal input to DFHSM's application backup.

alias. An alternative name for an entry or for a member of a partitioned data set (PDS).

alias. An alternative name for a data set. In a CVOL catalog, only the high-level name of a fully qualified data set name may have an alias.

alias entry. An entry that relates an alias to the real entry name of a user catalog or non-VSAM data set.

allocation. Generically, the entire process of obtaining a volume and unit of external storage, and setting aside space on that storage for a data set.

ACDS (SMP). Alternate control data set. A data set used by SMP.

alternate index (AIX). In systems with VSAM, a key-sequenced data set containing index entries organized by the alternate keys of its associated base data records. It provides an alternate means of locating records in the data component of a cluster on which the alternate index is based.

alternate index cluster. The data and index components of an alternate index.

alternate-index entry. In VSAM, a catalog entry that contains information about an alternate index. An alternate-index entry points to a data entry and an index entry to describe the alternate index's components, and to a cluster entry to identify the alternate index's base cluster.

alternate-index record. A collection of items used to sequence and locate one or more data records in a base cluster. Each alternate-index record contains an alternate key value and one or more pointers, which vary according to the type of data set supported by the alternate index. When the alternate index supports a key-sequenced data set (KSDS), each data record's prime key value is the pointer. When the alternate index supports an entry-sequenced data set (ESDS), the data record's RBA value is the pointer.

alternate index upgrade. The process of reflecting changes made to a base cluster in its associated alternate indexes.

alternate key. One or more characters within a data record used to identify the data record or control its use. Unlike the prime key, the alternate key can identify more than one data record. It is used to build an

alternate index or to locate one or more base data records via an alternate index.

application. The use to which an access method is put or the end result that it serves; contrasted to the internal operation of the access method.

Asynchronous Operations Manager (AOM). A component of MVS/DFP that is a "control" interface to the IBM 3990 subsystem.

authorized program analysis report (APAR). Authorized program analysis report. A report of a problem caused by a suspected defect in a current unaltered release of a program.

authorized program facility (APF). A system facility that permits the identification of programs that are authorized to use restricted functions.

automatic backup. In DFHSM, the process of automatically copying eligible data sets from primary volumes or migration volumes to backup volumes during a specified backup cycle.

automatic class selection (ACS). A mechanism for assigning SMS classes and storage groups to data sets.

automatic call library mechanism. The process in which control sections are processed by the linkage editor or loader to resolve external references to members of partitioned data sets not resolved by primary input processing.

automatic data set protection (ADSP). A user attribute that causes all permanent DASD data sets defined by the user to be automatically defined to RACF.

automatic dump. In DFHSM, the process of using DFDS to automatically do a full volume dump of all allocated space on primary volumes to designated tape dump volumes.

automatic migration. In DFHSM, the process of automatically moving eligible data sets either from primary volumes to level 1 volumes or from level 1 volumes to level 2 volumes without a specific request for each data set so moved.

auxiliary storage. All addressable storage, other than the memory of a processing unit, that can be accessed by means of an input/output channel; for example, storage on DASD, tape, or mass storage system volumes.

availability. For a storage subsystem, the degree to which a data set can be accessed when requested by a user.

B

backup. The process of copying data and storing it for use in case the original data is somehow damaged or destroyed.

backup data set. A copy that can be used to replace or reconstruct a damaged data set.

base cluster. A key-sequenced data set or entry-sequenced data set over which one or more alternate indexes are built.

base configuration information. The base information for a configuration which includes default device geometry, default unit, system names for the complex, SMS resource status token, default management class, and data set status.

base RBA. In VSAM, the relative byte address (RBA) stored in the header of an index record that is used to calculate the RBAs of data or index control intervals governed by the index record.

basic catalog structure (BCS). The name of the actual catalog structure within the integrated catalog facility environment. The integrated catalog facility catalog is composed of a BCS together with its related volume tables of contents (VTOCs) and VSAM volume data sets (VDSs).

blkref field. A field the user specifies in a program and that contains either the relative or the actual address of the record to which the user wants access. If it is the relative address, the BDAM address conversion routines convert it to an actual address (MBBCHHR). The actual address is then placed in the IOBSEEK field of the IOB so that the channel program can use the address to find a block. The address of the blkref field is in the block address operand of the READ or WRITE macro.

block position feedback. A user-specified option that causes the system to put the actual or relative address of the block just read or written into the area specified in the block address operand of the READ or WRITE macro. The format of the address will be MBBCHHR if feedback was not specified in the DCB macro; otherwise, the format will be the same as the addressing scheme in the DCB macro.

block size. The number of records, words, or characters in a block of data; usually specified in bytes.

block unused. For non-VSAM data sets, block unused represents the amount of space (returned in kilobytes) that would be saved if the optimal block size were used instead of the current block size. For VSAM data sets, block unused represents the amount of space (returned in kilobytes) that would be saved if

the optimal CI (control interval) size were used instead of the current CI size.

buffer. A routine or storage used to compensate for a difference in the rate of flow of data, or time of occurrence of events, when transferring data from one device to another.

buffer pool. A continuous area of storage divided into buffers.

C

cache. In a storage controller, a high-speed storage buffer that is continually updated to contain recently-accessed contents of DASD storage. Its purpose is to reduce access time.

candidate volume. A direct-access storage volume that has been defined in a VSAM catalog as a VSAM volume; VSAM can then automatically allocate space on this volume, as needed.

capacity record. The first block (block 0) on each track of a data set. It contains the ID of the last block on the track and the number of usable bytes remaining on the track.

catalog. A data set that contains extensive information required to locate other data sets, to allocate and deallocate storage space, to verify the access authority of a program or operator, and to accumulate data set usage statistics. See *master catalog* and *user catalog*.

catalog address space (CAS). A separate address space in virtual storage that contains catalog management modules and control blocks.

catalog cleanup. A process that allows the deletion of entries if their volume is no longer available; catalog cleanup also allows deletion of a catalog even though it is not empty. Catalog cleanup is a function of the DELETE command.

catalog connector. A catalog entry, called either a user catalog entry or a catalog connector entry, in the master catalog that points to a user catalog's volume (that is, it contains the volume serial number of the direct-access volume that contains the user catalog).

catalog recovery area (CRA). An entry-sequenced data set that exists on each volume owned by a recoverable catalog, including the volume on which the catalog resides. The CRA contains copies of the catalog's records, and can be used to recover a damaged catalog.

cataloged data set. In a CVOL catalog, a data set that is represented in an index or hierarchy of indexes that provides the means for locating the data set.

CATX. Option to open integrated catalog facility catalog without SCV26.

cell. An occurrence of information such as passwords, volume information, or associations.

channel program. One or more channel command words that control a specific sequence of data channel operations. Execution of the specific sequence is initiated by a single start I/O (SIO) instruction.

checkpoint. A designated point in a program where information about a job is collected and recorded in a separate checkpoint data set for restart purposes.

class. See *SMS class*.

cluster. In VSAM, a named structure consisting of a group of related components. For example, when the data is key-sequenced, the cluster contains both the data and the index components; for data that is entry-sequenced, the cluster contains only a data component.

cluster entry. A catalog entry that contains information about a key-sequenced or entry-sequenced VSAM cluster: ownership, cluster attributes, and the cluster's passwords and protection attributes. A key-sequenced cluster entry points to both a data entry and an index entry. An entry-sequenced cluster entry points to a data entry only.

collating sequence. An ordering assigned to a set of items, such that any two sets in that assigned order can be collated. As used in this publication, the order defined by the System/370 8-bit code for alphabetic, numeric, and special characters.

common filter service (CFS). A subcomponent of DFP common services. CFS compares data items with filter keys and indicates which data items match the keys and how many matches have been found.

common service area (CSA). A part of the common area of virtual storage that contains data areas addressable by all address spaces.

common VTOC access facility (CVAF). An MVS/DFP component used to retrieve information from indexed and nonindexed VTOCs.

communications data set (COMMDS). The primary means of communication among systems in an SMS complex. Shared among the systems in the SMS complex, the COMMDS is a VSAM linear data set that contains the name of the ACDS and current utilization statistics for each SMS-managed volume.

complex. See *SMS complex*.

component. A named, cataloged collection of stored records. A component, the lowest member of the hierarchy of data structures that can be cataloged, contains no named subsets.

composite external symbol dictionary (CESD). Control information associated with a load module that identifies the external symbols in the module.

compression. (1) A method for removing imbedded unused space from between members of a partitioned data set. (2) See *key compression*.

configuration. (1) The arrangement of a computer system as defined by the characteristics of its functional units. (2) See *SMS configuration*.

connectivity. Relationship that establishes the eligibility of a given system in an SMS complex to access a VIO storage group, a pool storage group, and the individual volumes within a pool storage group. The relationship can be NOTCON (not connected), indicating ineligibility, or any of the following, all of which imply eligibility: ENABLE, QUIALL (quiesce all), QUINEW (quiesce new), DISALL (disable all), DISNEW (disable new).

construct. A collective name for data class, storage class, management class, and storage group.

control area (CA). A group of control intervals used as a unit for formatting a data set before adding records to it. Also, in a key-sequenced data set, the set of control intervals pointed to by a sequence-set index record; used by VSAM for distributing free space and for placing a sequence-set index record adjacent to its data.

control-area split. The movement of the contents of some of the control intervals in a control area to a newly-created control area, to facilitate the insertion or lengthening of a data record when there are no remaining free control intervals in the original control area.

control blocks in common (CBIC). A facility that allows the user to open a VSAM data set so the VSAM control blocks are placed in the common service area (CSA) of the MVS operating system. This provides the capability for multiple memory accesses to a single VSAM control structure for the same VSAM data set.

control data set (CDS). With respect to SMS, a VSAM linear data set containing configurational, operational, or communication information. SMS introduces three types of control data sets: the source control data set, the active control data set, and the communications data set.

control interval (CI). A fixed-length area of auxiliary storage space in which VSAM stores records. It is the unit of information (an integer multiple of block size) transmitted to or from auxiliary storage by VSAM.

control interval access. The retrieval or storage of the contents of a control interval.

control interval definition field (CIDF). In VSAM, the four bytes at the end of a control interval that contains the displacement from the beginning of the control interval to the start of the free space and the length of the free space. If the length is 0, the displacement is to the beginning of the control information.

control-interval split. The movement of some of the stored records in a control interval to a free control interval, to facilitate the insertion or lengthening of a record that won't fit in the original control interval.

control volume (CVOL). A volume that contains one or more indexes of the catalog.

CONVERTED. A physical volume status indicating that all of the data sets on a volume have an associated storage class and are cataloged in an integrated catalog facility catalog. SMS can select a CONVERTED volume for all supported functions. See *INITIAL*.

cross memory. A synchronous method of communication between address spaces.

CVOL catalog. The collection of all data set indexes maintained by CVOL catalog management.

cylinder. The tracks of a disk storage device that can be accessed without repositioning the access mechanism.

cylinder fault. In MSS, a condition that occurs when the operating system requires data that has not been staged. The cylinder fault causes a cylinder of data to be staged.

D

DASD calculation services (DCS). DASD calculation services. A subcomponent of DFP common services. DCS retrieves and calculates data set information for both VSAM and non-VSAM data sets based on the user's input request.

data class. A list of the data set allocation parameters and their values, used when allocating a new SMS-managed data set.

data component. The part of a VSAM data set, alternate index, or catalog that contains the object's data records.

data control block (DCB). A control block used by access method routines in storing and retrieving data.

data entry. A catalog entry that describes the data component of a cluster, alternate index, page spaces, or catalog. A data entry contains the data component's attributes, allocation and extent information, and statistics. A data entry for a cluster's or catalog's data component can also contain the data component's passwords and protection attributes.

data extent block (DEB). A control block that describes the physical attributes of the data set.

Data Facility Data Set Services (DFDSS). An IBM licensed program used to copy, move, dump, and restore data sets and volumes.

Data Facility Hierarchical Storage Manager (DFHSM). An IBM licensed program used to back up, recover, and manage volumes.

Data Facility Product (DFP). An IBM licensed program used to manage programs, devices, and data in an MVS operating environment.

DFSMS. The complementary functions of MVS/DFP and other individual products of the Data Facility family, which, together with RACF, provide a system-managed, administrator-controlled storage environment.

data integrity. Preservation of data or programs for their intended purpose. As used in this publication, the safety of data from inadvertent destruction or alteration.

data management. The task of systematically identifying, organizing, storing, and cataloging data in an operating system.

data record. A collection of items of information from the standpoint of its use in an application, as a user supplies it to VSAM for storage. Contrast with *index record*.

data security. Prevention of access to or use of data or programs without authorization. As used in this publication, the safety of data from unauthorized use, theft, or purposeful destruction.

data set. The major unit of data storage and retrieval in the operating system, consisting of data in a prescribed arrangement and described by control information to which the system has access. As used in this publication, a collection of fixed- or variable-length records in auxiliary storage, arranged by VSAM in key sequence or entry sequence. See also *key-sequenced data set* and *entry-sequenced data set*.

data set name. An identifier that clearly names a data set.

data set pointer entry (DSPE). A CVOL catalog entry that identifies the volume on which a named data set resides.

data space. A storage area defined in the volume table of contents of a direct-access volume for the exclusive use of VSAM to store data sets, indexes, and catalogs.

default device geometry. Part of the configuration base, it identifies the number of bytes per track and the number of tracks per cylinder for converting TRK and CYL requests into bytes, when no generic UNIT exists. SMS uses the converted value to determine how many tracks or cylinders to allocate to the data set.

default management class. Part of the configuration base, it identifies the management class that DFHSM is to apply to SMS-managed data sets that do not have a management class explicitly specified.

default unit. Part of the configuration base, it identifies an esoteric (such as SYSDA) or generic (such as 3380) device name. If an end user fails to specify the UNIT parameter on their JCL, SMS applies the default unit to all data sets having a disposition of either MOD or NEW that are *not* SMS-managed.

DEQ. An Assembler language macro instruction used to remove control of one or more serially reusable resources from the active task (dequeue). It can also be used to determine whether control of the resource is currently assigned to, or requested for the active task.

demand paging. Transfer of a page from external page storage to real storage at the time it is needed for execution.

device management. The task of defining input and output devices to the operating system, and then controlling the operation of these devices.

Device Support Facilities (ICKDSF). An IBM system control program used to initialize DASD and to recover from DASD errors caused by defective tracks.

dialog. An application which runs under the ISPF dialog manager; a dialog may consist of programs, command procedures, panels, messages, tables, and files.

dialog variable. Named variables which are defined to ISPF and are used for communication between dialog function, programs, command procedures, panels, messages, tables, and files.

direct access. The retrieval or storage of data by a reference to its location in a data set rather than relative to the previously retrieved or stored data. See also *addressed-direct access* and *keyed-direct access*.

direct access device space management (DADSM). An MVS/DFP component used to control space allocation and deallocation on DASD.

direct access storage device (DASD). A storage device in which the access time is effectively independent of the location of the data.

DIS. device information services. A subcomponent of DFP common services. DIS permits a user to obtain information related to the unit control blocks (UCBs) for devices that are attached to the system.

disable all (DISALL). Relationship that prevents a system from allocating or accessing data sets in a VIO storage group, a pool storage group, or individual volumes within a pool storage group.

disable new (DISNEW). Relationship that prevents a system from allocating new data sets in a VIO storage group, a pool storage group, or individual volumes within a pool storage group.

discrete profile. A RACF profile that contains security information about a single data set, user, or resource. Contrast with *generic profile*.

distributed free space. Space reserved within the control intervals of a key-sequenced data set for inserting new records into the data set in key sequence; also, whole control intervals reserved in a control area for the same purpose.

DOC. Keyword for documentation problem.

dummy record. A record, created when BSAM builds a BDAM data set containing format F records, whose purpose is to provide space in which new records can be added to the data set after it is created. The first byte in the key field of the dummy record contains X'FF', and the first byte in the data field has a value indicating the position of the dummy record on the track (the R in MBBCCHHR).

dummy storage group. A type of storage group that contains the serial numbers of volumes that no longer reside on a system but that end users still refer to in their JCL. These volumes are treated as SMS-managed volumes. Dummy storage groups allow old JCL to function without having to be changed.

dump class. A DFHSM-named set of characteristics that describe how volume dumps are managed.

dynamic address translation (DAT). (1) The change of a virtual storage address to a real storage address during execution of an instruction. (2) A hardware feature that performs the translation.

dynamic allocation. The allocation of a data set or volume by the use of the data set name or volume serial number rather than by the use of information contained in a JCL statement.

dynamic buffering. A user-specified option that requests that the system handle acquisition, assignment, and release of buffers.

E

early warning system (EWS). A microfiche copy of the data that is contained in SSF (Software Support Facility).

ENABLE. Relationship that allows a system to allocate and access data sets in a VIO storage group, a pool storage group, or individual volumes within a pool storage group.

end user. A person in a data processing installation who requires the services provided by the computer system.

ENQ. An Assembler language macro instruction that requests the control program to assign control of one or more serially reusable resources to the active task (enqueue). It is also used to determine the status of a resource; that is, whether it is immediately available or in use, and whether control has been previously requested for the active task in another ENQ macro instruction.

enqueue. To build a list of requests for a named resource.

entry. A collection of information about a cataloged object in a master or user catalog. Each entry resides in one or more 512-byte records.

entry name. A unique name for each component or object as it is identified in a catalog. The entry name is the same as the dsname in a DD statement that describes the object.

entry sequence. The order in which data records are physically arranged (according to ascending RBA) in auxiliary storage, without respect to their contents. Contrast with *key sequence*.

entry-sequenced data set (ESDS). In VSAM, a data set whose records are loaded without respect to their contents, and whose RBAs cannot change. Records are retrieved and stored by addressed access, and new records are added at the end of the data set.

environment record. A 256-byte record that is written when CVOL Catalog Management discovers an error. This record, which contains significant data that is present at the time of the error, is written to the last block of the data set SYSCTLG for later analysis.

ESA/370. A hardware architecture unique to the IBM 3090 Enhanced model processors and the 4381 Model Groups 91E and 92E. It reduces the effort required for managing data sets, removes certain MVS/XA constraints that limit applications, extends addressability for system, subsystem, and application functions, and helps exploit the full capabilities of DFSMS.

esoteric name. A name used to define a group of devices having similar hardware characteristics, such as TAPE or SYSDA. Contrast with *generic name*.

exception. An abnormal condition such as an I/O error encountered in processing a data set or file.

exclusive control. Preventing multiple WRITE-add requests from updating the same dummy record or writing over the same available space on a track. When specified by the user, exclusive control requests that the system prevent the data block about to be read from being modified by other requests; it is specified in a READ macro and released in a WRITE or RELEX macro. When a WRITE-add request is about to be processed, the system automatically gets exclusive control of either the data set or the track.

exclusive control list. An area of storage containing the UCB address and actual address of resources under exclusive control, and the addresses of the first and last IOBs for requests waiting to get exclusive control of that resource.

export. To create a backup or portable copy of a VSAM cluster, alternate index, or integrated catalog facility user catalog.

extended link pack area (ELPA). The extension of the link pack area that resides above 16 megabytes in virtual storage. See also *link pack area*.

extended pageable link pack area (EPLPA). The extension of the pageable link pack area that resides above 16 megabytes in virtual storage. See also *pageable link pack area*.

extended search. A user-specified option that requests that the system search for the specified block or a place in which to add a new block. The search is to start with the first block on the track which contains the block address operand specified in the request macro. The search continues either for as many tracks or blocks (rounded up to a complete track) as are specified in the request macro, or until the search ends successfully.

Extended search is only applicable if relative addressing is being used.

extent. A continuous space on a DASD volume occupied by a data set or portion of a data set. An extent of a data set contains a whole number of control areas.

external page storage. The portion of auxiliary storage used to contain pages.

external procedure. A procedure that can be called by any other VSAM procedure; a procedure whose name is in the module's (assembler listing) "external symbol dictionary."

external symbol dictionary (ESD). See *composite external symbol dictionary*.

F

feedback. See *block position feedback* and *next address feedback*.

field. In a record or control block, a specified area used for a particular category of data or control information.

filter list (FILTLIST). An inclusion/exclusion pair of lists that define filter criteria. FILTLISTs simplify comparison operations in ACS routines.

fixed link pack area (FLPA). A fixed area of virtual storage containing reenterable routines that are loaded at IPL and exist until the next IPL.

format channel program. A channel program that writes a new record to an already existing data set. See also *preformat channel program* and *self-format channel program*.

free control interval pointer list. In a sequence-set index record, a vertical pointer that gives the location of a free control interval in the control area governed by the record.

FREEMAIN. An Assembler language macro instruction that releases one area of main storage that had previously been allocated to the job step as a result of a GETMAIN macro instruction.

free space. Space reserved within the control intervals of a key-sequenced data set for inserting new records into the data set in key sequence or for lengthening records already there; also, whole control intervals reserved in a control area for the same purpose.

front compression. The elimination, from the front of a key, of characters that are the same as the characters in front of the preceding key.

function modification identifier (FMID). A code that identifies the release level of a DFP component.

G

generalized trace facility (GTF). An optional OS/VS service program that records significant system events, such as supervisor calls and start I/O operations, for the purpose of problem determination.

generation data group (GDG). A collection of historically related non-VSAM data sets that are arranged in chronological order; each data set is known as a generation data set.

generation data group base entry. An entry that permits a non-VSAM data set to be associated with other non-VSAM data sets as generation data sets.

generation data set (GDS). One of the data sets in a generation data group; it is historically related to the others in the group.

generation index. An index of the CVOL catalog that identifies the generations of a generation data group.

generation index pointer entry (GIPE). A CVOL catalog entry that identifies a generation index.

generic key. A high-order portion of a key, containing characters that identify those records that are significant for a certain application. For example, it might be desirable to retrieve all records whose keys begin with the generic key AB, regardless of the full key values.

generic name. A name assigned to a class of devices (such as 3380) that is derived from the IODEVICE statement in the MVS configuration program. Contrast with *esoteric name*.

generic profile. A RACF profile that contains security information about multiple data sets, users, or resources that may have similar characteristics and require a similar level of protection. Contrast with *discrete profile*.

GETMAIN. An Assembler language macro instruction that is used to allocate an area of main storage for use by the job step task.

gigabyte. 1 073 741 824 bytes.

global shared resources (GSR). An option for sharing I/O buffers, I/O-related control blocks, and channel programs among VSAM data sets in a resource pool that serves all address spaces in the system.

global storage. Virtual storage that is not part of a user's private address space.

guaranteed space. A storage class attribute indicating that SMS is to honor user-specified VOL=SER= specifications, and that SMS is to fail the request if space is not available on the specified volumes. This attribute also preallocates space on all volumes specified by the user.

H

header entry. In a parameter list of GENCB, MODCB, SHOWCB, or TESTCB, the entry that identifies the type of request and control block and gives other general information about the request.

high-level name. The first component of a qualified name. This name is found in a volume index of the CVOL catalog.

horizontal extension. An extension record pointed to by a catalog record's extension field. See also *vertical extension*.

horizontal pointer. A pointer in an index record that contains the RBA of another index record in the same level that contains the next key in collating sequence; used for keyed-sequential access.

I

import. To restore a VSAM cluster, alternate index, or integrated catalog facility catalog from a portable data set created by the EXPORT command.

inactive configuration. A configuration contained in an SCDS which is not currently being used by SMS.

INCORROUT. Keyword for incorrect output.

incremental backup. In DFHSM, the process of copying a data set that has been opened for other than read-only access since the last backup version was created, and that has met the backup frequency criteria.

index. As used in this publication, an ordered collection of pairs, each consisting of a key and a pointer, used by VSAM to sequence and locate the records of a key-sequenced data set; organized in levels of index records. See also *index level*, *index set*, and *sequence set*.

index component. That part of a key-sequenced data set, catalog, or alternate index that establishes the sequence of the data records within the object it indexes. The index is used to locate each record in the object's data component, based on the record's key value.

index control entry (ICE). The first entry of each index of the CVOL catalog. This entry contains all control information about the index.

index entry. A catalog entry that describes the index component of a key-sequenced cluster, alternate index, or catalog. An index entry contains the index component's attributes, passwords and protection attributes, allocation and extent information, and statistics.

index level. A set of index records that order and give the location of records in the next lower level or of control intervals in the data set that it controls.

index link entry (ILE). The last entry of each block of the CVOL catalog, used to link blocks of one index together in a chain.

index pointer entry (IPE). A CVOL catalog entry that attaches a lower-level index to the index in which it is found.

index record. A collection of index entries that are retrieved and stored as a group. Contrast with *data record*.

index record header. In an index record, the 24-byte field at the beginning of the record that contains control information about the record.

index replication. The use of an entire track of direct access storage to contain as many copies of a single index record as possible; this reduces rotational delay.

index set. The set of index levels above the sequence set. The index set and the sequence set together comprise the index.

index upgrade. The process of reflecting changes made to a base cluster in its associated alternate indexes.

Info/System. An interactive retrieval program product designed for use with the companion data base feature Info/MVS.

INITIAL. A physical volume status indicating that some data sets on a given volume lack an associated storage class or are not cataloged in an integrated catalog facility catalog.

initialize. With respect to SMS, to include the IGDSMSxx member in SYS1.PARMLIB. IGDSMSxx provides initialization parameters and identifies SMS to the system.

initial program load (IPL). (1) The initialization procedure that causes an operating system to commence operation. (2) The process by which a configuration

image is loaded into storage at the beginning of a work day or after a system malfunction.

in-place conversion. The process of bringing a volume and the data sets it contains under the control of SMS, without requiring a second volume to serve as an intermediary holding place during the conversion.

integrated catalog facility. The name of the catalog in MVS/DFP that is a functional replacement for OS CVOLs and VSAM catalogs.

integrated catalog facility catalog. Consists of two types of components: the basic catalog structure (BCS) and at least one VSAM volume data set (VVDS). The integrated catalog facility catalog is a functional replacement for VSAM catalogs and OS CVOLs; integrated catalog facility catalogs feature improvements over VSAM catalogs in reliability, recoverability, performance, usability, and DASD space management. It is also the only catalog that is supported by the Storage Management Subsystem (SMS).

integrity. See *data integrity*.

interactive. Pertaining to an application in which each entry calls forth a response from the system or program, usually in the form of a conversational dialog with screens and menus.

Interactive Storage Management Facility (ISMF). An interactive MVS/DFP facility for defining and viewing how the Storage Management Subsystem manages storage.

Interactive System Productivity Facility (ISPF). An IBM licensed program used to develop, test, and run application programs interactively. ISPF is the interactive interface for all storage management functions.

internal procedure. A procedure that can be called only by other procedures within the module. See also *external procedure*.

interval migration. In DFHSM, automatic migration that occurs when the high threshold of occupancy is reached or exceeded on a primary volume during a specified time interval. Data sets are moved from the volume, oldest first, until the low threshold of occupancy is reached.

invalid. A status indicating that an SCDS or ACDS is in error. Either the SCDS is incomplete, or an ACS routine in the SCDS has assigned an undefined SMS class name or assigned a storage group list containing undefined names. An invalid SCDS cannot be activated.

IOB buffer queue. A queue containing the addresses of IOBs for requests for which a buffer is not available. The BCB contains the addresses of the first and last IOB in this chain, and the IOBDQPTR field in each IOB in the chain contains the address of the next IOB. This queue is used only when real storage is specified for a task.

ISAM interface. A set of routines that allow a processing program coded to use ISAM (indexed sequential access method) to gain access to a VSAM key-sequenced data set.

J

job catalog. A catalog made available for a job by means of the JOBCAT DD statement.

job step catalog. A catalog made available for a job by means of the STEPCAT DD statement.

K

key. One or more characters within an item of data that are used to identify it or control its use. As used in this publication, one or more consecutive characters taken from a data record, used to identify the record and establish its order with respect to other records.

key compression. The elimination of characters from the front and the back of a key that VSAM does not need to distinguish the key from the preceding or following key in the index record; it reduces the storage space for an index.

keyed-direct access. The retrieval or storage of a data record by use of either an index that relates the record's key to its relative location in the data set or a relative record number, independent of the record's location relative to the previously retrieved or stored record. Contrast with *addressed-direct access*, *keyed-sequential access*, and *addressed-sequential access*.

keyed-sequential access. The retrieval or storage of a data record in its key or relative record sequence relative to the previously retrieved or stored record, as defined by the sequence set of an index. Contrast with *addressed-sequential access*, *keyed-direct access*, and *addressed-direct access*.

key field. A field located in the same position in each record of a data set, whose contents are used as the key of a record.

key range. In VSAM, a particular key range (for example, A-F) that is specifically associated with one or more control ranges of a data set.

key sequence. The collating sequence of data records, determined by the value of the key field in each of the data records. It may be the same as, or different from, the entry sequence of the records.

key-sequenced data set (KSDS). A VSAM data set whose records are loaded in ascending key sequence and controlled by an index. Records are retrieved and stored by keyed access or by addressed access, and new records can be inserted in key sequence because of free space allocated in the data set. Relative byte addresses can change, because of control interval or control area splits.

keyword. A symptom that describes one aspect of a program failure.

kilobyte. 1024 bytes.

L

level. A conceptual relationship between indexes of the CVOL catalog. The index corresponding to the simple name of a data set is said to be the lowest level; the first component of a qualifier name is said to correspond to the highest-level index.

level 0 volume. A primary volume or a user volume not managed by DFHSM.

level 1 volume. A volume owned by DFHSM containing data sets that migrated from a level 0 volume.

level 2 volume. A volume under control of DFHSM containing data sets that migrated from a level 1 volume, or from a volume not managed by DFHSM.

level number. For the index of a key-sequenced data set, a binary number in the header of an index record that indicates the index level to which the record belongs.

library. A partitioned data set containing a related collection of named members.

linear data set (LDS). A VSAM data set that contains data but no control information. A linear data set can be accessed as a byte-addressable string in virtual storage.

LINK. An Assembler language macro instruction that causes control to be passed to a specified entry point. The linkage relationship established is the same as that created by a BAL instruction.

link-edit. To create a loadable computer program using the linkage editor to process object and load modules.

link pack area (LPA). An area of virtual storage containing reenterable routines that are loaded at IPL

and can be used concurrently by all tasks in the system.

load module. The output of the linkage editor; a program in a format ready to load into virtual storage for execution.

load module buffer. An area of virtual storage used by the linkage editor to read input load module text records and possibly to retain the text information in storage for subsequent writing of the output load module text records.

local shared resources (LSR). An option for sharing I/O buffers, I/O-related control blocks, and channel programs among VSAM data sets in a resource pool that serves one partition or address space.

local storage. Virtual storage in a user's private address space.

locate. Pertains to functions that do not change the status of a catalog; that is, read-only operations are performed.

logical record. (1) A record from the standpoint of its content, function, and use rather than its physical attributes; that is, one that is defined in terms of the information it contains. (2) A unit of information normally pertaining to a single subject; a logical record is that user record requested of or given to the data management function.

M

management class. A list of the migration, backup, and retention parameters and their values, for an SMS-managed data set.

mass sequential insertion. A technique VSAM uses for keyed-sequential insertion of two or more records in sequence into a collating position in a data set; it is more efficient than inserting each record separately.

Mass Storage System. The name for the entire storage system, consisting of the Mass Storage Facility and all devices that are defined to the Mass Storage Control.

mass storage volume. Two data cartridges in the IBM 3850 Mass Storage System that contain information equivalent to what would be stored on a direct-access storage volume.

master catalog. A catalog that contains extensive data set and volume information that VSAM requires to locate data sets, to allocate and deallocate storage space, to verify the authorization of a program or operator to gain access to a data set, and accumulate usage statistics for data sets.

memory. As used in this book, a synonym for the private address space in virtual storage.

migration. In DFHSM, the process of moving a cataloged data set from a primary volume to a level 1 volume or level 2 volume, from a level 1 volume to a level 2 volume, or from a volume not managed by DFHSM to a level 1 or level 2 volume.

migration level 0. A state of storage indicating that end users can directly access a data set residing on an SMS-managed volume.

migration level 1. A state of storage indicating that end users cannot directly access a data set residing on a mounted DASD. Either the system or an end user must issue a RECALL command to access the data set.

migration level 2. A state of storage indicating that end users cannot directly access a data set residing on a tape device. Either the system or the end user must issue a RECALL command to access the data set.

MODESET. A Supervisor macro instruction used to change the system status by altering the PSW key or the mode indicator.

modified link pack area (MLPA). An area of virtual storage containing reenterable routines from the SYS1.LINKLIB, SYS1.SVCLIB, or SYS1.LPALIB system data sets that are to be part of the pageable extension of the link pack area during the current IPL.

module. The unit of code that is link-edited. A program module has at least one procedure, and may have many.

must-complete. An indication to the operating system that the event must be performed without interruption or waiting.

MVS configuration program. A program that is used to define I/O configurations to MVS/XA. MVSCP replaces the I/O definition functions of IOGEN and EDTGEN. See also *I/O device generation* and *eligible device table generation*.

MVS/DFP. An IBM licensed program used to manage programs, devices, and data in an MVS operating environment, and which is the base for the Storage Management Subsystem.

MVS/ESA. An MVS operating system environment which supports ESA/370.

MVS/SP. An IBM licensed program used to control the MVS operating system and establish a base for an MVS/ESA, MVS/XA, or MVS/370 environment.

MVS/XA. An MVS operating system environment that supports 31-bit real and virtual storage addressing, increasing the size of addressable real and virtual storage from 16 megabytes to 2 gigabytes.

MVS/370. An MVS operating system environment that supports 24-bit real and virtual storage addressing.

N

next address feedback. A user-specified option that causes the system to put the relative address (TTR) of the next data or capacity record into the area specified in the next address operand of the READ or WRITE macro. (If the *type* operand in the READ or WRITE macro terminated with an R, the address of the next data record is returned; if it terminated with an RU, the address of the next data or capacity record is returned, whichever occurs first.) Next address feedback is only applicable for operations involving format VS records.

nonlocate. Pertains to functions that change the status of a catalog; that is, write operations are performed.

non-SMS volume. A volume that is not controlled by SMS.

non-VSAM entry. A catalog entry that describes a non-VSAM data set. A non-VSAM entry contains the data set's volume serial number and device type. If the data set resides on a magnetic tape volume, the entry can also identify the data set's file number. When the data set resides on a direct-access device, the operating system obtains further information by examining the data set's DSCB (data set control block) in the volume's VTOC (volume table of contents).

non-VSAM volume record (NVR). A VVDS record which contains SMS-related information about a non-VSAM, system-managed data set.

not connected (NOTCON). Relationship that indicates a system is defined but has no access to a VIO storage group, a pool storage group, or individual volumes within a pool storage group.

O

object. A named byte string. In the context of optical programming support, an object generally refers to a document image or coded document combined. Surrounding the images or coded data are IBM format descriptive headers and trailers.

Object Access Method (OAM). A program that provides object storage, object retrieval, and object storage hierarchy management. OAM isolates applications from storage devices, storage management and storage device hierarchy management.

object code only (OCO). Licensed programs for which source materials are not made available to licensees.

object module. A module that is the output of an assembler or compiler and is input to the linkage editor.

online. Pertaining to equipment, devices, or data under the direct control of the processor.

operating system. Software that controls the execution of programs; an operating system may provide such services as resource allocation, scheduling, input/output control, and data management.

optimal block size. For non-VSAM data sets, optimal block size represents the block size that would result in the greatest space utilization on a device, taking into consideration record length and device characteristics.

optimal CI size. For VSAM data sets, optimal CI size represents the control interval size that would result in the greatest space utilization on a device.

OS control volume (OS CVOL). A volume that contains one or more indexes of the catalog.

OS/VS2 MVS. An MVS operating system that was the predecessor to MVS/XA.

P

page. (1) A fixed-length block of instructions, data, or both, that can be transferred between real storage and external page storage. (2) To transfer instructions, data, or both between real storage and external page storage.

pageable link pack area (PLPA). An area of virtual storage containing SVC routines, access methods, and other read-only system and user programs that can be shared among the users of a system. See also *link pack area*.

page fault. A program interruption that occurs when a page that is marked "not in real storage" is referred to by an active page.

paging. A technique in which blocks of data, or pages, are moved back and forth between main storage and auxiliary storage. Paging is the implementation of the virtual storage concept.

page space. A system data set that contains pages of virtual storage. The pages are stored into and retrieved from the page space by the auxiliary storage manager.

partitioned data set (PDS). A data set in DASD storage that is divided into partitions, called members, each of which can contain a program, part of a program, or data. See also *library*.

partitioned data set extended (PDSE). A Storage Management Subsystem-managed, page-formatted data set. PDSEs contain an indexed directory and members, similar to the directory and members of partitioned data sets. PDSEs can be used instead of partitioned data sets.

password. A unique string of characters stored in a catalog that a program, a computer operator, or a terminal user must supply to meet security requirements before a program gains access to a data set.

path. A named, logical entity composed of one or more clusters (an alternate index and its base cluster, for example).

path entry. A catalog entry that contains information about a path, and that points to the path's related objects.

PDS directory. A set of records in a partitioned data set (PDS) used to relate member names to their locations on a DASD volume.

performance. For a storage subsystem, a measurement of effective data processing speed against the amount of resource that is consumed by a complex. Performance is largely determined by throughput, response time, and system availability.

physical record. A record whose characteristics depend on the manner or form in which it is stored, retrieved, or moved. A physical record may contain all or part of one or more logical records.

physical storage. With respect to data, the actual space on a storage device that is to contain data.

physical volume status. Relationship between a pool storage group and each of its individual volumes, indicating if all data sets on a given volume have an associated storage class and are cataloged in an integrated catalog facility catalog.

plaintext. A data set or key which is not enciphered (with the cryptographic option). A data set or key is plaintext before it is enciphered and after it is deciphered.

pointer. An address or other indication of location. For example, an RBA is a pointer that gives the relative location of a data record or a control interval in the data set to which it belongs.

pool. See *storage pool*.

pool storage group. A type of storage group that contains the serial numbers of SMS-managed volumes. Pool storage groups allow groups of volumes to be managed as a single entity.

portability. The ability to use VSAM data sets with different operating systems. Volumes whose data sets are cataloged in a user catalog can be demounted from storage devices of one system, moved to another system, and mounted on storage devices of that system. Individual data sets can be transported between operating systems using access method services.

portable data set. A data set that can be transported between systems using access method services.

preformat channel program. A channel program that writes a new format F record to an already existing data set.

primary space allocation. Initially allocated space on a direct access storage device, occupied by or reserved for a particular data set. See also *secondary space allocation*.

primary volume. A volume managed by DFHSM containing data sets that are directly accessible to the user.

prime index. The index component of a key-sequenced data set.

prime key. One or more characters within a data record used to identify the data record or control its use. A prime key must be unique.

problem determination area (PDA). An area provided by the calling program and filled in with diagnostic information by the service.

procedure. A functional unit of VSAM code that is entered only at one entry point and exits at the end of the procedure (the last line of the procedure's code). The procedure can call (transfer control, with a return to the procedure expected) other procedures within the module (internal calls) and can call other procedures in other VSAM modules (external calls). See also *internal procedure* and *external procedure*.

processing program. Any program that is not a control program; synonymous with problem program.

program management. The task of preparing programs for execution, storing the programs in load libraries, and executing them on the operating system.

program status word (PSW). An area in storage used to indicate the order in which instructions are executed, and to hold and indicate the status of the system.

Q

qualified name. A data set name consisting of a string of names segmented by periods; for example, TREE.FRUIT.APPLE is a qualified name. See also *simple name*.

qualifier. Each component name in a qualified name other than the rightmost name. For example, TREE and FRUIT are qualifiers in TREE.FRUIT.APPLE.

quiesce all (QUIALL). Relationship that prevents a system from scheduling jobs that allocate or access data sets in a VIO storage group, a pool storage group, or individual volumes within a pool storage group.

quiesce new (QUINEW). Relationship that prevents a system from scheduling jobs that allocate new data sets or modify existing ones in a VIO storage group, a pool storage group, or individual volumes within a pool storage group.

R

RACF always call. A term for the procedure used by MVS/DFP to check all data sets automatically for discrete or generic RACF profiles to verify access authority.

RACF authorization. (1) The facility for checking a user's level of access to a resource against the user's desired level of access. (2) The result of that check.

random access. See *direct access*.

READ-exclusive request. A READ request specifying that exclusive control should be acquired for the record about to be read.

read-only variable. An ACS language variable that contains data set or system-derived information. It can be referenced but not altered in an ACS routine.

read-write variable. An ACS language variable that is assigned a value within an ACS routine. It can be referenced, and each ACS routine assigns a value to its own unique read-write variable.

rear compression. The elimination, from a key, of characters to the right of the first character that is unequal to the corresponding character in the following key.

recall. The process of moving a migrated data set from a level 1 or level 2 volume to a level 0 (primary) volume or to a volume not managed by DFHSM.

record. A set of data treated as a unit.

record definition field (RDF). A field stored as part of a stored record segment; it contains the control information required to manage stored record segments within a control interval.

recoverable catalog. A catalog defined with the recoverable attribute. Duplicate catalog entries are put into catalog recovery areas (CRAs) that can be used to recover data in the event of catalog failure. See also *catalog recovery area*.

recovery termination manager (RTM). A program that handles all normal and abnormal termination of tasks by passing control to a recovery routine associated with the terminated function.

recovery volume. The first volume of a prime index, if the VSAM data set is a key-sequenced cluster; otherwise, the first volume of the data set, if entry-sequenced.

relative address. The position of a block in a data set relative to the first block of a data set. The relative address can be a relative track number or relative block number. See *relative track address* and *relative block address*.

relative block address. A 3-byte binary number that indicates the position of a block in relation to the first block of a data set. The first block of a data set always has a relative block address of 0.

relative byte address (RBA). The displacement of a data record or a control interval from the beginning of the data set to which it belongs; independent of the manner in which the data set is stored.

relative extent. An area in the DEB containing the number of blocks in each extent and the number of blocks in each track (if track overflow is not in effect) of a data set. Module IGG0193A builds the relative extent area when relative block addressing is specified in the processing program.

relative record data set (RRDS). A VSAM data set whose records are loaded into fixed-length slots.

relative record number (RRN). A number that identifies not only the slot, or data space, in a relative record data set but also the record occupying the slot. Used as the key for keyed access to a relative record data set.

relative track address. A 3-byte binary number in the form TTR where:

TT is the position of the track relative to the first track of a data set. The first track has a relative position of 0.

R is the number of the block relative to the first block on the track TT. The first block of data on a track has a relative value of 1.

relocation dictionary (RLD). A set of records in an object or load module that identifies all addresses that must be adjusted when the module is relocated in virtual storage.

replication. See *index replication*.

residence mode (RMODE). The attribute of a load module that identifies where in virtual storage the program will reside (above or below 16 megabytes).

resource. Any facility of the computing system or operating system required by a job or task, including main storage, input/output devices, the central processing unit, data sets, and control processing systems.

Resource Management Facility (RMF). A licensed program that monitors the availability and activity of an MVS system.

resource pool, VSAM. See *VSAM resource pool*.

RETURN. An Assembler language macro instruction that is used to return control to the calling CSECT, and to signal normal termination of the returning CSECT.

reusable data set. A VSAM data set that can be reused as a work file, regardless of its old contents. It must not be a base cluster of an alternate index.

ripple. Moving data from one block of a chain to the next, because of modification of data in a preceding block.

RPL string. A set of chained request parameter lists (the set may contain one or more RPLs) used to gain access to a VSAM data set by action macros (GET, PUT, etc.). Two or more RPL strings may be used for concurrent direct or sequential requests made from a processing program or its subtasks.

S

SAVE. An Assembler language macro instruction that causes the contents of the specified registers to be stored in the save area at the address contained in register 13.

SCRATCH. An Assembler language macro instruction that points to the CAMLST macro instruction. SCRATCH, the first operand of CAMLST, specifies that a data set be deleted.

search argument. The field of a data block that contains information identifying the block as unique from any other block in the data set. Can be either the key field or the block ID in the count field. This term is also used to describe the string of keywords containing software failure symptom keywords.

search limit. The track following the last track that should actually be searched in a data set. The search limit is calculated and put in the IOBUPLIM field of the IOB when the DCB specifies the extended search option.

secondary space allocation. A predefined contiguous space on a DASD volume reserved for additions to a particular data set, and allocated only after the primary allocation space is full. See also *primary space allocation*.

security. See *data security*.

segment. The portion of a spanned record contained within a control interval. See also *spanned record*.

self-format channel program. A channel program that writes a new format U, V, or VS record to an already existing data set.

sequence checking. The process of verifying the order of a set of records relative to some field's collating sequence.

sequence set. The lowest level of the index of a key-sequenced data set; it gives the locations of the control intervals in the data set and orders them by the key sequence of the data records they contain. The sequence set and the index set together comprise the index.

sequential access. The retrieval or storage of a data record in: its entry sequence, its key sequence, or its relative record number sequence, relative to the previously retrieved or stored record. See also *addressed-sequential access* and *keyed-sequential access*.

sequential data set. A data set whose records are organized on the basis of their successive physical

positions, such as on magnetic tape. Contrast with *direct data set*.

serialization. In MVS, the prevention of a program from using a resource that is already being used by an interrupted program until the interrupted program is finished using the resource.

service request block (SRB). A system control block used for dispatching tasks.

shared resources. A set of functions that permit the sharing of a pool of I/O-related control blocks, channel programs, and buffers among several VSAM data sets open at the same time.

simple name. The rightmost component of a qualified name. For example, APPLE is the simple name in TREE.FRUIT.APPLE. The simple name corresponds to the lowest index level in the CVOL catalog for the data set name.

skip-sequential access. Keyed sequential retrieval or storage of records here and there throughout a data set, skipping automatically to the desired record or collating position for insertion; VSAM scans the sequence set to find a record or a collating position. Valid for processing in ascending sequences only.

slot. For a relative record data set, the data area addressed by a relative record number which may contain a record or be empty.

SMS class. A list of attributes that SMS applies to data sets having similar allocation (data class), performance (storage class), or backup and retention (management class) needs.

SMS complex. A set of up to eight systems within an installation that are defined to MVS in the base configuration as SMS systems.

SMS configuration. A configuration base, SMS class and storage group definitions, and ACS routines that SMS uses to manage storage.

SMS-managed data set. A data set that has been assigned a storage class.

SMS service level. A set of logical characteristics of storage required by an SMS-managed data set (for example, performance, security availability).

SMS volume. See *CONVERTED*.

Software Support Facility. An IBM online data base that contains information about all current APARs (authorized program analysis reports) and PTFs (program temporary fixes).

source catalog. An existing catalog that may be exported into a target catalog.

source control data set (SCDS). A VSAM linear data set containing the SMS class and storage group definitions, ACS routines, and system information that together represent an SMS configuration.

source module. A module containing the source statements which will be provided as input to a language translator or compiler.

spanned record. A logical record whose length exceeds control interval length, and as a result, crosses, or spans, one or more control interval boundaries within a single control area.

sphere. The collection of base cluster, alternate indexes, and upgrade alternate indexes opened to process one or more paths related to the same base information block (BIB).

sphere record. A collection of logically related subrecords in one VSAM logical record.

spooling. (1) The use of auxiliary storage as a buffer to reduce processing delays when transferring data between peripheral equipment and the processors of a computer. (2) The reading of input data streams and the output of data streams on auxiliary storage devices, concurrently with job execution, in a format convenient for later processing or output operations.

step catalog. See *job step catalog*.

storage administrator. A person in the data processing installation who is responsible for defining, implementing, and maintaining storage management policies.

storage class. A list of DASD storage performance, security, and availability service level requirements for an SMS-managed data set.

storage group. A list of traits and characteristics that SMS applies to groups of storage volumes having similar migration, backup, and dump needs. Only the storage administrator can access storage group definitions.

storage management complex. The set of systems within an installation running intercommunicating copies of SMS.

Storage Management Subsystem (SMS). An operating environment that helps automate and centralize the management of storage. To manage storage, SMS provides the storage administrator with control over data class, storage class, management class, storage group, and ACS routine definitions.

storage pool. A predefined set of DASD volumes used to store groups of logically related data according to user requirements for service or according to storage management tools and techniques.

stored record. A data record, together with its control information, as stored in auxiliary storage.

string. The part of a control block structure built around a placeholder (PLH) that enables VSAM to keep track of one position in the data set that the control block structure describes.

structured data base (SDB). A facility of the IBM RETAIN system that permits searching the software support data base with a system-generated string of closely defined symptom keywords built from user-entered data.

subrecord. The user definition level of a sphere, such as an alternate index, cluster, or generation data set.

subroutine identification. The 2 low-order bytes of each module's unique 8-byte name.

synchronization time interval. The number of seconds that SMS allows before it checks the COMMDS for volume status, space statistics, and configurational changes from other systems in the complex.

system-managed storage. An approach to storage management in which the system determines data placement and an automatic data manager handles data backup, movement, space, and security.

system management facilities (SMF). Programs used to gather, measure, and record information about system actions and performance.

System Modification Program Extended (SMP/E). An IBM licensed program used to make software changes to modules and macros in the operating system. SMP/E is an extended and enhanced version of SMP.

T

task control block (TCB). Holds control information related to a task.

target catalog. The catalog that data sets or a source catalog are imported into by access method services.

telecommunications access method (TCAM). An access method used to transfer data between main storage and and remote or local terminals.

terminal monitor program (TMP). In TSO, a program that accepts and interprets commands from the ter-

minal, and causes the appropriate command processors to be scheduled and executed.

track overflow. A user-specified option that will allow a format F record whose space requirements exceed the space remaining on the track to be partially written on that track and completed on the next track.

tracks unused. For data sets specifying cylinder allocation, tracks unused represents the number of unused tracks (returned in kilobytes) over all cylinders allocated.

transaction ID. A number associated with each of several request parameter lists that define requests belonging to the same data transaction.

translate. To check ACS routine source code for syntactic and semantic errors. If no errors exist, the translation process generates an object table from the source table and places the object table into a specified SCDS.

true name. (1) In a CVOL catalog, the high-level qualifier to which an alias is related. (2) Refers to the names generated for the data and index components as a result of the DEFINE command.

U

uncatalog. To remove the catalog entry of a data set from a catalog.

unit control block (UCB). A control block in storage that describes the characteristics of a particular I/O device on the operating system.

universal character set (UCS). A printer feature that permits the use of a variety of character arrays. Character sets used for these printers are called UCS images.

unposted queue. A queue of IOBs that are waiting to get exclusive control of a resource currently under exclusive control. The unposted queue contains only IOBs for the current task.

unscheduled list. An area of virtual storage containing the addresses of IOBs for requests for which a buffer is not available. It is used only when virtual storage is specified for a task.

update channel program. A channel program that reads or writes data for purposes other than adding a new block to an existing data set.

update number. For a spanned record, a binary number in the second RDF of a record segment that indicates how many times the segments of a spanned record should be equal. An inequality indicates a possible error.

upgrade set. All the alternate indexes that VSAM has been instructed to update whenever there is a change to the data component of the base cluster.

user buffering. The use of a work area in the processing program's address space for an I/O buffer; VSAM transmits the contents of a control interval between the work area and direct access storage without intermediary buffering.

user catalog. An optional catalog used in the same way as the master catalog and pointed to by the master catalog. It also lessens the contention for the master catalog and facilitates volume portability.

user catalog connector. See *catalog connector*.

V

valid. A status indicating that an SCDS or ACDS is complete. The ACS routines only assign SMS class names and lists of storage group names that are defined to the SCDS. To be complete, an SCDS must contain at least one storage class definition, at least one pool storage group definition containing at least one volume, a storage group selection routine, and base configuration information. A valid SCDS can be activated.

validate. To check the completeness and consistency of an individual ACS routine or an entire SCDS.

vertical extension. An extension record pointed to by a set-of-fields pointer in the object's base catalog record or its horizontal extension. See also *base catalog record* and *horizontal extension*.

vertical pointer. A pointer in an index record of a given level that gives the location of an index record in the next lower level or the location of a control interval in the data set controlled by the index.

VIO storage group. A type of storage group that allocates data sets to paging storage, which simulates the activity of a DASD volume. VIO storage groups do not contain any actual DASD volumes.

virtual storage. Addressable space that appears to the user as real storage, from which instructions and data are mapped into real storage locations. The size of virtual storage is limited by the addressing scheme of the computing system and the amount of auxiliary storage available, rather than by the actual number of real storage locations.

virtual storage constraint relief (VSCR). The use of extended areas in virtual storage to store system programs, buffers, and control blocks, leaving more space below 16 megabytes for user programs.

virtual volume. The data from a mass storage volume while it is located on a staging drive.

volume. A certain portion of data, together with its data carrier, that can be mounted on the system as a unit; for example, a tape reel or a disk pack. For DASD, a volume refers to the amount of space accessible by a single actuator.

volume application. Using a list of volumes constructed by ISMF, you can perform tasks against an individual volume. These tasks include consolidating or recovering unused space, copying, backing up, and restoring volumes.

volume cleanup. The process of deleting all VSAM data spaces from a volume and removing a VSAM catalog's ownership of a volume, even though the volume contains VSAM data records.

volume control block (VCB). A block of the catalog that identifies as many as 20 volumes containing one data set.

volume control block pointer entry (VCBPE). A CVOL catalog entry that identifies a VCB for a named data set.

volume index. The highest level of index in the CVOL catalog structure. Entries in the volume index point to all lower indexes and simple names.

volume index control entry (VICE). The first entry in the volume index. The VICE describes the volume index and controls space allocation in SYSCTLG.

volume pooling. Grouping volumes and managing them as if they were a single, large volume rather than managing them on an individual basis.

volume serial number (VOLSER). An identification number in a volume label that is assigned when a volume is prepared for use on the system.

volume table of contents (VTOC). A table on a direct access storage device (DASD) that describes each data set on the volume.

VSAM catalog. A key-sequenced data set or file with an index containing extensive data set and volume information that VSAM requires to locate data sets or files, allocate and deallocate storage space, verify the authorization of a program or operator to gain access to a file, and accumulate usage statistics for data sets or files. VSAM catalogs have been functionally replaced by integrated catalog facility catalogs.

VSAM catalogs are also not supported by the Storage Management Subsystem.

VSAM resource pool. A virtual storage area that is used share I/O buffers, I/O-related control blocks, and channel programs among VSAM data sets. A resource pool is local or global; it serves tasks in one partition or address space or tasks in all address spaces in the system.

VSAM shared information (VSI). Blocks that are used for cross-system sharing.

VSAM volume control record (VVCR). The first logical record in the VVDS that contains information to manage DASD space and the BCS back pointers.

VSAM volume data set (VVDS). A data set that describes the data set characteristics of VSAM data sets residing on a given volume; part of an integrated catalog facility catalog.

VSAM volume record (VVR). The VSAM volume record is a VSAM logical record within a VVDS.

W

WAIT. An Assembler language macro instruction that informs the control program that the issuing program cannot continue until a specific event, represented by an event control block, has occurred.

where-to-go table (WTG). The name of a table used to transfer control between common O/C/EOV modules.

WRITE-add request. A request to write a new block to the data set.

WRITE-release request. A WRITE-update request that specifies exclusive control should be released for the record about to be written.

WRITE-update request. A request to write an already existing block to the data set.

write-validity check. A user-specified option that causes the system to verify the accuracy of any data written by the channel program.

X

XCTL (transfer control). An Assembler language macro that causes control to be passed to a specified entry point.

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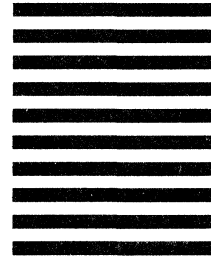


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