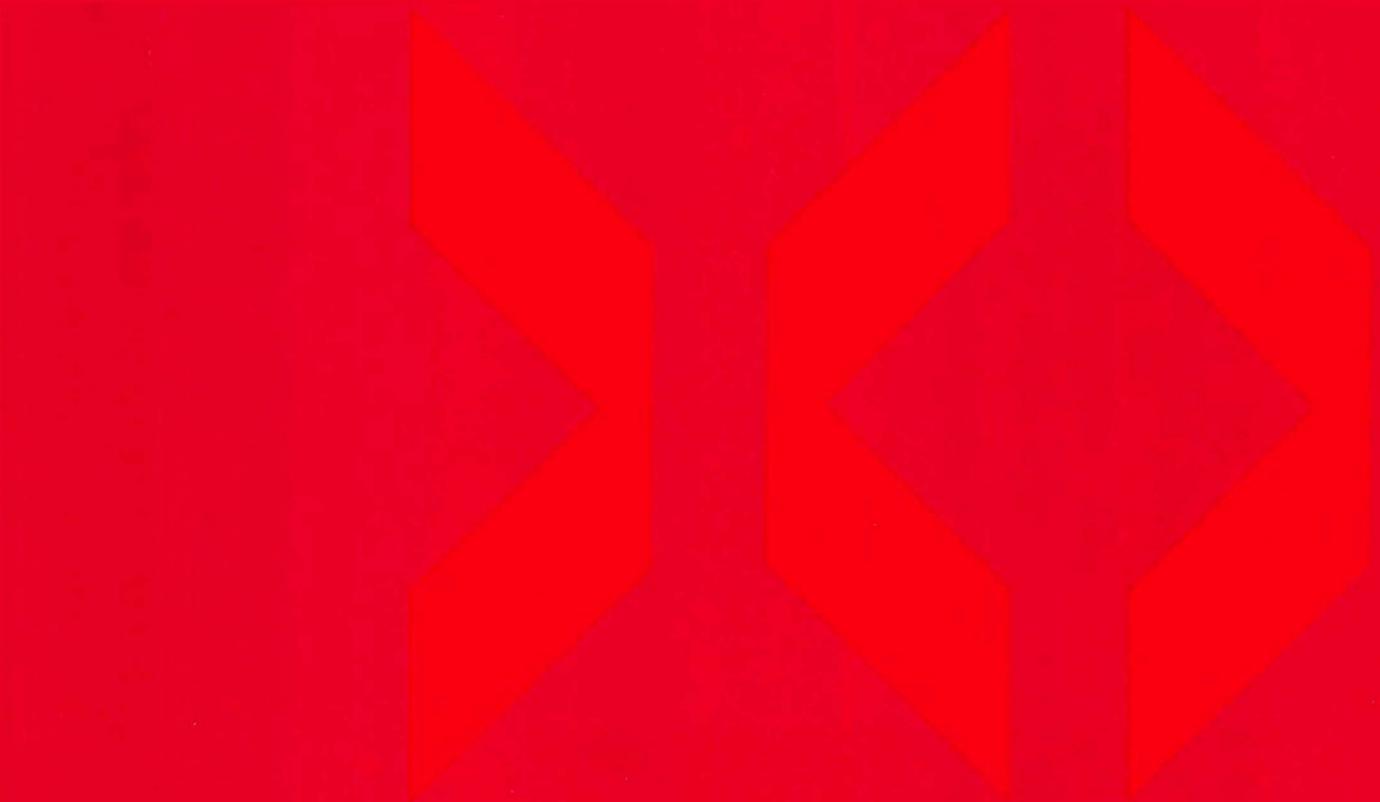




**MVS/Extended Architecture  
Data Facility Product  
Version 2: Diagnosis Guide**

Licensed  
Program





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**MVS/Extended Architecture  
Data Facility Product  
Version 2: Diagnosis Guide**

Licensed  
Program

### **First Edition (June 1987)**

This edition applies to Version 2 Release 3.0 of MVS/Extended Architecture Data Facility Product, Licensed Program 5665-XA2, and to any subsequent releases until otherwise indicated in new editions or technical newsletters.

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, and 4300 Processors Bibliography*, GC20-0001, for the editions that are applicable and current.

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## Preface

This book is intended to help diagnosticians identify, describe, report, and resolve failures in all components of the Data Facility Product (DFP). The related publication, *DFP Diagnosis Reference*, LY27-9530, 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.

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## How To Use This Book

This book directs you through a step-by-step procedure to help you build a string of standard keywords that describe common failures. You can then 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 one of the following:

- An APAR fix
- A Program Temporary Fix (PTF)
- 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 for all DFP components. Any component that requires component-specific activity leaves the common path to perform that activity, then returns.

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## How This Book Is Organized

This book contains the following sections:

**Introduction:** explains the keyword concept and the elements of a keyword string.

**Searching with the Keyword String:** explains how to use the keyword string as a search argument against the IBM software support data base.

**Type-of-Failure Keyword:** explains how to specify the type of program failure as a keyword.

**Module Keyword:** explains how to identify the name of the failure-related module and specify it as a keyword.

**Modifier Keywords:** explains how to describe the failure more precisely by specifying modifier keywords.

**Component Identification Keyword:** explains how to specify the failing Component ID as a keyword.

**Release Level Keyword:** explains how to specify the component release level as a keyword.

**Service Level Keyword:** explains how to specify the module service level as a keyword.

**Gathering Additional Failure-related Documentation:** explains how to gather additional documentation to more precisely define the failure.

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## Prerequisite Knowledge

To use this book efficiently, you should already have a basic understanding of the IBM Support structure. You should also be familiar with the following subjects:

- Basic dump analysis
- Diagnostic techniques

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## Required Publications

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

- *DFP Customization*, (GC26-4267) provides guidance and reference information for customizing DFP in the areas of installation exits, replaceable modules, and ISMF display panels.
- *MVS/XA Diagnostic Techniques*, (LY28-1199) provides guidelines on how to isolate problems on an MVS/XA system.
- *ISMF User's Guide*, (GC26-4266) provides guidance in using ISMF.
- *ISPF Dialog Management Services*, (SC34-2088) provides guidance in using ISPF.
- *OS/VS System Modification Program (SMP): System Programmer's Guide* (GC28-0673) describes how to use SMP to install or remove system modifications, how to create and initialize SMP data sets, and how to correct and prevent installation errors. It also describes the different types of system modifications, SMP processing, and provides examples of system modifications.
- *System Modification Program Extended (SMP/E) User's Guide* (SC28-1302) provides an overview of SMP/E and discusses how to allocate and initialize the SMP/E data sets.

## Related Publications

Within the text, references are made to the publications listed in the table below:

Short Title (as it appears in the text)	Publication Title	Order Number
Access Method Services Reference (Integrated Catalog)	<i>MVS/Extended Architecture Integrated Catalog Administration: Access Method Services Reference</i>	GC26-4135
Access Method Services Reference (VSAM Catalog)	<i>MVS/Extended Architecture VSAM Catalog Administration: Access Method Services Reference</i>	GC26-4136
Data Administration: Macro Instruction Reference	<i>MVS/Extended Architecture Data Administration: Macro Instruction Reference</i>	GC26-4141
Debugging Handbook	<i>MVS/Extended Architecture Debugging Handbook, Volumes 1 through 6</i>	LC28-1164 <sup>1</sup> LC28-1165 LC28-1166 LC28-1167 LC28-1168 LC28-1169
DFDSS: Diagnosis Guide	<i>MVS/Extended Architecture Data Facility Data Set Services: Diagnosis Guide</i>	SY26-3951
DFDSS: User's Guide and Reference	<i>MVS/Extended Architecture Data Facility Data Set Services: User's Guide and Reference</i>	SC26-4125
DFHSM: Diagnosis Guide	<i>MVS/Extended Architecture Data Facility Hierarchical Storage Manager Diagnosis Guide</i>	SH35-0095
DFHSM: Messages	<i>MVS/Extended Architecture Data Facility Hierarchical Storage Manager Messages</i>	SH35-0094
DFP Diagnosis Reference	<i>MVS/Extended Architecture Data Facility Product Version 2: Diagnosis Reference</i>	LY27-9530
Diagnostic Techniques	<i>MVS/Extended Architecture Diagnostic Techniques</i>	SY28-1199
EREP User's Guide and Reference	<i>Environmental Recording, Editing, and Printing (EREP) User's Guide and Reference</i>	GC28-1378
ISPF Diagnosis	<i>Interactive System Productivity Facility Version 2 Diagnosis</i>	SC34-2140

<sup>1</sup> All six volumes may be ordered under one order number, LBOF-1015.

Short Title (as it appears in the text)	Publication Title	Order Number
Programming System General Information (PSGIM)	<i>IBM Field Engineering Pro- gramming System General Information</i>	G229-2228
Service Aids	<i>MVS/Extended Architecture System Programming Library: Service Aids</i>	GC28-1159
SMP System Pro- grammer's Guide	<i>OS/VS System Modification Program (SMP): System Pro- grammer's Guide</i>	GC28-0673
SMP/E Reference	<i>System Modification Program Extended (SMPIE) Reference</i>	SC28-1107
SMP/E User's Guide	<i>System Modification Program Extended (SMPIE) User's Guide</i>	SC28-1302
Supervisor Services and Macro Instructions	<i>MVS/Extended Architecture System Programming Library: Supervisor Services and Macro Instructions</i>	GC28-1154
System Codes	<i>MVS/Extended Architecture Message Library: System Codes</i>	GC28-1157
System Commands	<i>MVS/Extended Architecture Operations: System Commands</i>	GC28-1206
System Messages	<i>MVS/Extended Architecture Message Library: System Mes- sages, Volumes 1 and 2</i>	GC28-1376 GC28-1377
TSO Command Lan- guage Reference	<i>MVS/Extended Architecture TSO Command Language Ref- erence (OS/VS2 TSO Command Language Reference, as updated by Supplement SD23-0259 for MVS/XA)</i>	GC28-0646
Using Data Facility Hierarchical Storage Management with the Interactive Storage Management Facility	<i>MVS/Extended Architecture Using Data Facility Hierarchical Storage Management with the Interactive Storage Manage- ment Facility</i>	SH35-0108
Utilities	<i>MVS/Extended Architecture Data Administration: Utilities</i>	GC26-4150
Vocabulary for Data Processing, Telecom- munications, and Office Systems	<i>Vocabulary for Data Proc- essing, Telecommunications, and Office Systems</i>	GC20-1699
VSAM Administration Guide	<i>MVS/Extended Architecture VSAM Administration Guide</i>	GC26-4151

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## Summary of Changes

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**Release 3.0, June 1987**

### Changes to Data Facility Product Library

DFP diagnosis information from the following DFP publications has been moved to this book and combined to create a common DFP diagnosis procedure. The books in the following list have been deleted from the DFP library and are superseded by this manual.

<b>Publication Title</b>	<b>Order Number</b>
<i>MVS/Extended Architecture Catalog Diagnosis Guide</i>	LY26-3955
<i>MVS/Extended Architecture DFP Common Services Diagnosis Guide</i>	LY26-3959
<i>MVS/Extended Architecture DADSM and Common VTOC Access Facility Diagnosis Guide</i>	LY26-3960
<i>MVS/Extended Architecture Interactive Storage Management Facility Diagnosis Guide</i>	LY26-3906
The guide portion of <i>MVS/Extended Architecture Media Manager Diagnosis Guide and Reference</i> retitled <i>MVS/Extended Architecture Media Manager Diagnosis Reference</i>	LY26-3965

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## Introduction

This publication enables Data Facility Product (DFP) users to:

- Develop a string of standard symptom keywords describing a 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 execute either a *freeform* search using the keywords built as this document directs, or you may use the keywords as a base from which to conduct a search of the *structured data base* (SDB) facility. In the latter case, SDB:

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

If an APAR for the problem has not been submitted, you will need the keywords strings for which you have executed searches if you request assistance from the IBM Support Center and they recommend submitting an APAR.

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

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"General Diagnostic Aids" on page 1
"BDAM Diagnostic Aids" on page 2
"DADSM/CVAF Diagnostic Aids" on page 3
"DFP Common Services Diagnostic Aids" on page 36
"ISMF Diagnostic Aids" on page 42
"Linkage Editor/Loader Diagnostic Aids" on page 63
"Media Manager Diagnostic Aids" on page 87
"OPEN/CLOSE/EOV (Common) Diagnostic Aids" on page 92
"SAM Diagnostic Aids" on page 135
"VIO Diagnostic Aids" on page 140
"VSAM Diagnostic Aids" on page 154
"VSAM—Access Method Services Diagnostic Aids" on page 224
"VSAM—Catalog Management Diagnostic Aids" on page 285
"VSAM—CVOL Processor" on page 322
"VSAM—OPEN/CLOSE/EOV Diagnostic Aids" on page 328
"VSAM—Record Management Diagnostic Aids" on page 343

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## 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.

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## Searching with the Keyword String

When you have developed a keyword string describing the 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.

## Searching with the Keyword String

- **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” on page 5.
- 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 92. 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.
- Go to “Preliminary Failure Source Isolation” on page 7 to begin building your 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 92. 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.

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## Keyword Worksheet

Date: \_\_\_\_\_ Time: \_\_\_\_\_ IBM Problem Number: \_\_\_\_\_

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### Problem Description (including symptoms not described by keywords):

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### 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: \_\_\_\_\_

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Release Level: \_\_\_\_\_ Service Level: \_\_\_\_\_

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### Search Arguments Used:

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### Information Provided by IBM Support Center

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## Preliminary Failure Source Isolation

Use this section to isolate the probable source of a failure to an area within 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 DFP is related to the failure.

### Procedure

1. If the failure involves a DFP component and ISMF *does not* seem to be involved, go to "Type-of-Failure Keyword" on page 9
2. If the failure seems related to ISMF, use Figure 1 to identify the failing function, and continue below.

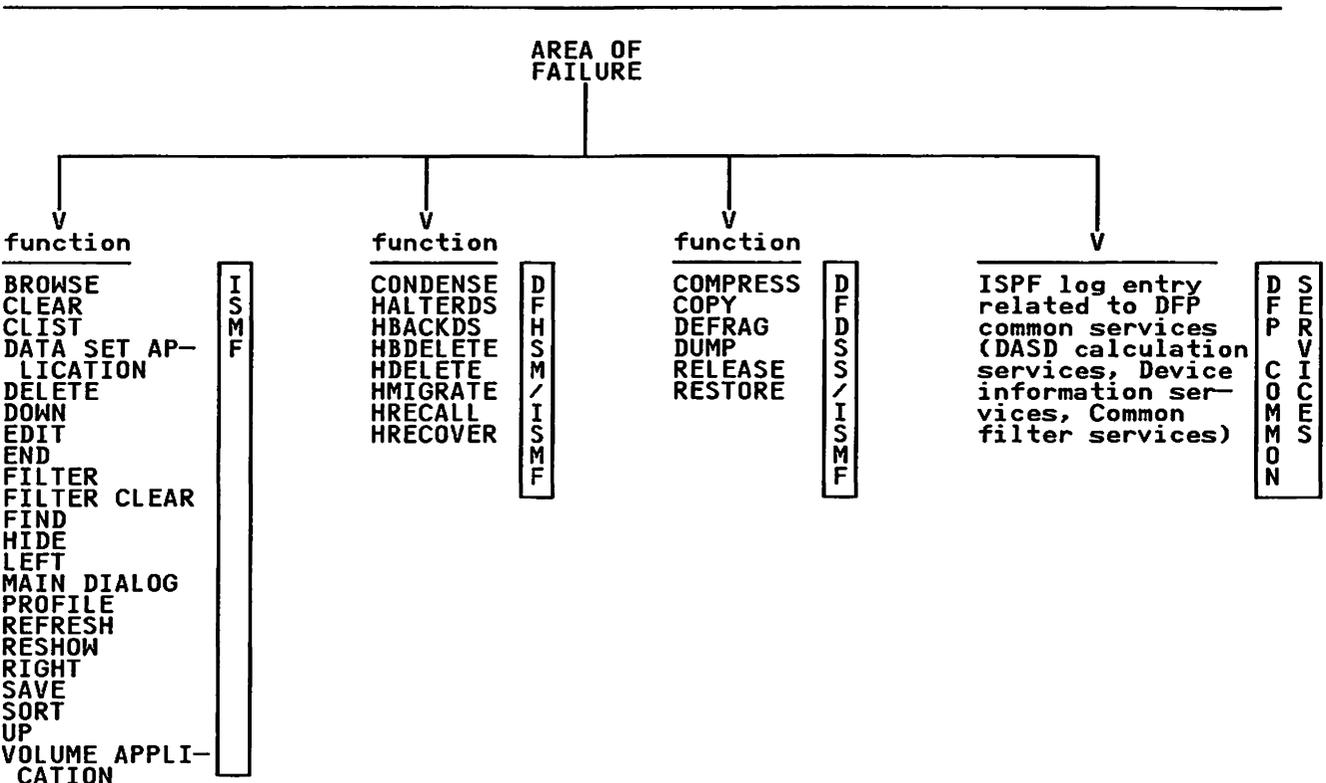


Figure 1. ISMF Failure Isolation Aid

- a. Use this table together with the associated entry in the ISPF log to isolate the failure source (see the sample ISPF log entry in Figure 8 on page 47 in the related publication *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 Guide* or *DFHSM Diagnosis Guide* as appropriate.

- c. If the failure involves a reason code associated with one of the DFP common services, use the DFP common services-specific sections of the keyword build procedures and see the DFP common services section of the related publication *DFP Diagnosis Reference* to gather additional failure-related information.
- d. To begin developing the keyword string, go to “Type-of-Failure Keyword” on page 9.

## 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"> <li>• A program's printed system output</li> <li>• A system message's text</li> <li>• An ISMF abend panel</li> <li>• An ISPF abend panel</li> <li>• A TSO message identifying an abend</li> </ul>	Turn to "Abend Keyword" on page 10.
Wait/Loop	Program unexpectedly suspended; indicated by: <ul style="list-style-type: none"> <li>• No program response.</li> <li>• Repeating messages.</li> <li>• Repeating sequence of ISMF panels.</li> <li>• System abends 122, 222, 322, 522, 722, A22, C22 (See Figure 11 on page 25 for a description of these abends.)</li> </ul>	Turn to "Wait and Loop Keywords" on page 25.
Message	Error indicated by a system message.	Turn to "Message Keyword" on page 30.
Incorrect Output	<ul style="list-style-type: none"> <li>• Incorrect or missing output from a program</li> <li>• Incorrect ISMF panel flow or information</li> </ul>	Turn to "Incorrect Output Keyword" on page 38.
Performance	Performance less than what is expected.	Turn to "Performance Keyword" on page 46.
Documentation	Incorrect or incomplete documentation.	Turn to "Documentation Keyword" on page 47.

---

## 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.

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 DFP component received the ABEND.

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

---

IDA019RC	IDA019RI
IDA019RE	IDA019RJ
IDA019RG	IDA019RN
IDA019RH	IDA019RW

---

To determine whether you have a broken data set, use the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publications *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)* and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors" in the publication *VSAM Administration Guide*. 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 three following kinds of documentation. To determine the **ABEND CODE**, go to the procedure indicated in the following table:

<b>Documentation</b>	<b>Action</b>
ISMF/ISPF abend panels	Turn to "ISMF/ISPF—Abend Panels" on page 12
SVC Dump	Turn to "SVC Dump" on page 14.
SYSABEND, SYSMDUMP, or SYSUDUMP	Turn to "SYSABEND, SYSMDUMP, or SYSUDUMP." on page 19.

For more information on dump documentation and analysis, see the publication *Diagnostic Techniques*.

## Abend Keyword

### 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 13 show sample abend panels. Record the **ABEND CODE** and turn to “Building the Abend Keyword” on page 24.
- A TSO message appears indicating an abend condition. Turn to “TSO Messages for ISMF Abends” on page 13.

```
                                ISMF ABEND PANEL
COMMAND ==> _

*****
*****
**                               **
**                               **
**          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



## Abend Keyword

### 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 *OS/VS2 TSO Command Language 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
PSM AT TIME OF ERROR 078D1000 00B5A992 ILC 2 INTC 0D
NO ACTIVE MODULE FOUND
DATA AT PSM 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 00000000
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 24.

**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

To determine the keywords do the following:

1. Use AMDPRDMP to:
  - a. Save the dump data set.
  - b. Print the summary dump (SUMDUMP). (See the publication *Service Aids*.)
2. The title page of the SUMDUMP (see the example at Figure 6 on page 16) contains the dump header and title page, which provide failure-related symptoms extracted from the dump. (See Figure 7 on page 17 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

Abend Keyword

```

TITLE FROM DUMP: JOB=BUILDCAT.CAS ESTAE-566528418 R230.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

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

  RETAIN
MVS KEY  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:

  RETAIN
MVS KEY  KEY      SYMPTOM DATA      EXPLANATION
-----  -
VCBM/    FLDS/   CCA                MAPPING MACRO NAME
VCBM/    FLDS/   CCX                MAPPING MACRO NAME
VCBM/    FLDS/   CTGPL             MAPPING MACRO NAME
VCBA/    ADRS/   009E9900          CONTROL BLOCK ADDRESS
VCBA/    ADRS/   00C42800          CONTROL BLOCK ADDRESS
VCBA/    ADRS/   00970CA0          CONTROL BLOCK ADDRESS
  
```

Figure 6 (Part 1 of 2). Sample SUNDUMP

VAID/	VALU/H	000C	CALLERS ASID
VTGB/	ADRS/	009758B8	TCB ADDRESS
VCA/	ADRS/	800114DC	CALLERS ADDRESS
VCAN/	RIDS/	IGGPGETO	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 SUMDUMP

Term	Keywords present in sample dump header
JOB = BUILDCAT	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 R230	Component ID and release number
ABEND0C1	The dump was taken because of an 0C1abend
IGG0CLAT +007A	The abend occurred in CSECT IGG0CLAT at offset X'007A'
	<b>Note:</b> The dump header may contain additional symptoms.
	<b>Keywords present in dump title page</b>
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 0C1abend. <b>0C1 is the ABEND CODE</b>
IGG0CLA9	Recovery routine CSECT name
FI/:	Identifies the instruction string at the failing location

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

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')
	<b>Additional keywords present in dump title page</b>
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 24.
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 19.

## SYSABEND, SYSDUMP, or SYSUDUMP.

Depending on the JCL used, the system directs a dump to either the SYSUDUMP, SYSABEND, or SYSDUMP data set. If the system did not produce a dump, you may have to recreate the failure and obtain one. For information about obtaining a dump, see the publication *Diagnostic 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.

```
*****
JES2 JOB LOG -- SYSTEM PXA0 -- NODE SJFEVMC
----- JOB 14 IEF097I BUILDAT - USER AND GROUP ASSIGNED
09.18.23 JOB 14 SHASP373 BUILDAT 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 INTC 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 20 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.

Abend Keyword

```

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 JPQ      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    008FFF88 TCT      00000000 USER   00000000 NDSP    00002000 MDIDS   00000000
+00B4 JSCB     00AF7920 SSAT   00F883B0 IOBRC   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          XSCB   00000040 FOE     00000000 SWA     00000000 STAWA   00000000
+0100 TCBID   TCB      RTM12   00000000 ESTAE   00000000 UKYSP   7FFFC3B8 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 NDAMP   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

ACTIVE RBS

PRB  008EBDC8
-020 XSB      008EBE30 FLAGS2   00000000 RTPSM1   070C0000 0001939A          RTPSM2   00020001
-00C          008CD000 FLAGS1   02000000 MCSA    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 0000ABC7 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
  
```

Figure 9 (Part 1 of 3). Sample System Storage Dump



```

T10T 008F8128

TASK HAS NO OPEN DATA SETS

RTM2MA 008FA600
+000 ID RTM2 ADDR 008FA600 SPID FF LGTH 0009FC CVT 00F88590
+010 TCBC 008EBE88 VRBC 008FD338 ASC 00F5DE00 CCF 008EBDC8 CC 0C1000
+020 SFNA 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 INCL 0001 TRAN 008C0000 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
+0AC TIME 00000000 00000000 ERRA 40 ERRB 04 ERRC 00
+0B7 ERRD 01 FMID 0000 IOFS 20 RSV 00 RSV 00
+0BD FIOB FFFFFFF RBST 008EBDC8 RSV 00000000 SCBC 008FFF88 SCBN 008FFF88
+0D0 SCBO 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 7FFDF98 81AB5702 81AB3A60 D9E3F104 008FA600 00000000 01AB62C1 008EBE88
+19C 008FD338 81AB52C2 008FFF88 008FA600 01AB572C 00000000 008E3890 008FD398
+1BC PKEY 00 CCTL 0800 CTLT 00 MCTL 00 ABID 00
+1C2 ABND 00 RCTL 18 CTLR 00 DMPC 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
+2A0 000C1000 00000000 0000C10 00000000 00000000 00000000 00000000 00000000
+2C4 RMPS 008FA8C8 RMPL 80000006 00F5DE00 00000000 00000000 008FA8E0 00000000
+2E0 RMWS 43000000 7F8EBE88 008FA6BC 08000000 00000000 00000000 00000000 00000000
+304 00000000 00000000 00000000 00000000 00000000 00000000 00000000 RMSA 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
+3A4 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 OCHP 000000 OCRC 00000000
    
```

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

- 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 20, 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 for an example of the summary information.

RTM2WA SUMMARY	
-----	
+1C	COMPLETION CODE 840C1000
+8C	ABENDING PROGRAM NAME IGGPACDV
+94	ABENDING PROGRAM ADDR 00008A56
+3C	REGS AT TIME OF ERROR 00FBBC00 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

3. When you determine the **ABEND CODE**, continue at "Building the Abend Keyword" on page 24.

---

## Building the Abend Keyword

To build the abend keyword do the following:

1. Use the **ABEND CODE** that you have extracted from the supplied 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 48 (directly to the component-specific section, if one exists).

---

## Wait and Loop Keywords

Use this section when a 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.
- System abends 122, 222, 322, 522, 722, A22, C22 (see Figure 11 for a description of these abends).

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.

Figure 11. System Abends for WAITs and LOOPs

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

## Wait and Loop 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 27.
2. For all other 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 20, 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. (For the format of the system trace table, see the publication *Diagnostic Techniques*.)
  - An AMBLIST listing or SPZAP dump of the CSECT(s) that you suspect (see the publication *Service Aids*).
6. For VSAM Record Management/Block Processor, turn to “VSAM Record Management/Block Processor—Wait and Loop Keywords” on page 29.
  7. For all other DFP components, turn to “Module Keyword” on page 48.

---

## 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 75. 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 Abends and Takes Dumps” on page 42 in the related publication *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 28).

ISMF—Wait and Loop Keywords

```

JOB USER20          STEP IEFPROC      TIME 143854  DATE 86014  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  BMDP  00F63B80  CMSF  00000000  SVRB  007FD540
+0014  SYNC  00007BD5  IOSP  00000000  TNEH  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  00F77CCB
+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  TMCH  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  XHPQ  00000000  IQEA  00000000  RTMC  00000000
+00A8  MCC  00000000  JBNI  00000000  JBNS  00F77CD0  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  007FE800
+00E4  NDP  3D  TNDP  FF  NTSG  FF  IODP  3D  LOCI  00000000
+00EC  CMLH  00000000  CMLC  00000000  SSO1  000000  SSO4  00  ASTE  00F5E0B0
+00FC  LTOV  7FFFD000  ATOV  7FFFE750  ETC  0000  ETCN  0000  LXR  0000
+010A  AXR  0000  STKH  007FEB10  GOEL  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  RCHS  00000000  IOSC  00003933
+0144  PKML  0080  XCNT  01F4  NSQA  00000000  ASM  0193AEE0  RV30  00000000
+0154  TCME  00000000  RV70  00000000  00000000  00000000  CREQ  0000006B
+016C  RSME  0193AEC0  RV86  00000000  ARC  00000000  RSHA  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 below:

**WAIT**

- Turn to “ISMF—Modifier Keywords” on page 75.

---

## 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 broken VSAM data set. To determine whether you have a broken data set, use the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publications *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)* and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors" in the publication *VSAM Administration Guide*. The EXAMINE command provides details about the nature of data set damage.

Waits or loops can occur in several VSAM modules because of a broken 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 broken data set:

- SVC01 WAITs issued by module IDA019RZ
  - Interrupted processing with the TCB structure indicating an SVC01 WAIT issued from IDAM19R3 (IDA019R3)
2. Turn to "Module Keyword" on page 48.

---

## Message Keyword

Use this section for all Data Facility Product 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 of the DFP Diagnosis Guide**, 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.

Go to one of the procedures indicated below:

Component	Procedure
DADSM/CVAF	Turn to "DADSM/CVAF—Message Keyword" on page 31.
ISMF	Turn to "ISMF—Message Keyword" on page 33.
VSAM	Turn to "VSAM—Message Keyword" on page 36.
All other 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 48.

---

## DADSM/CVAF—Message Keyword

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

### Procedure

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 “DADSM/CVAF System Dumps” on page 19 in the related publication *DFP Diagnosis Reference* for CVAF dump analysis assistance.
3. 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 24 on page 72 for a list of valid CVFCTN field values.

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

```
IX DEL
```

4. Turn to “DADSM/CVAF—Module Keyword” on page 49.

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

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 **153**, specify the keyword string as shown:

```
MSGIEC606I RC153
```

2. 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
3. Record the CVAF module name identified in the system dump title on the "Keyword Worksheet" on page 6.
  4. Turn to "DADSM/CVAF—Module Keyword" on page 49.

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" on page 19 in the related publication *DFP Diagnosis Reference* for CVAF dump analysis assistance.

1. 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 72 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
```

2. Turn to "DADSM/CVAF—Module Keyword" on page 49.

**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 49.

---

## ISMF—Message Keyword

### Procedure

#### 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 13 for an example of a TSO message that can interrupt the screen. See “Messages Issued by Other Components” on page 35 to diagnose the error.

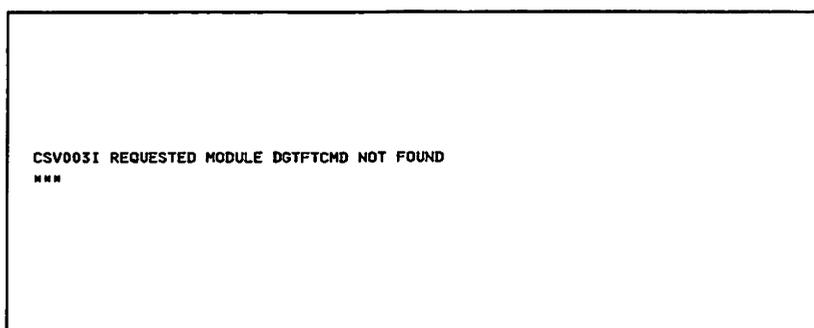


Figure 13. ISMF—Messages That Interrupt the Screen

- **ISMF or ISPF short error messages.** Figure 14 is an example of an 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, see Step 1 on page 34.

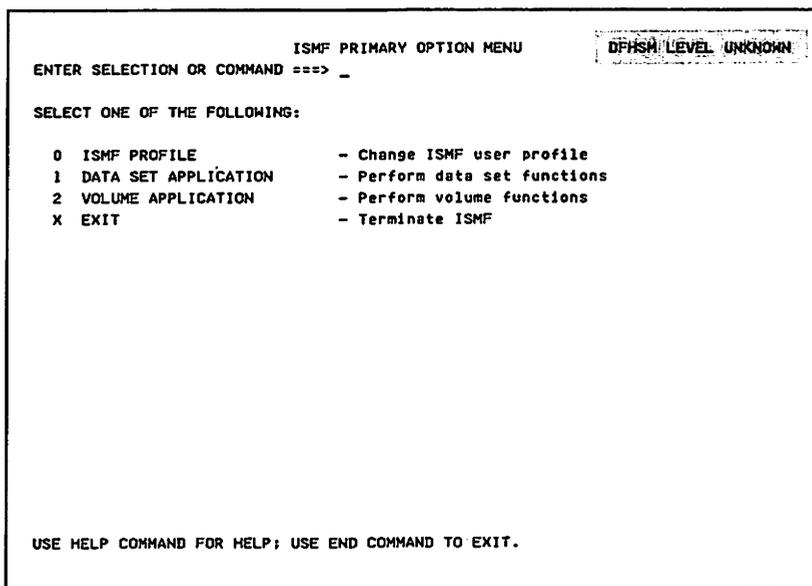


Figure 14. ISMF—Short Error Message

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 15 on page 34 is an example of an 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.

```

                                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 APPLICATION       - Perform data set functions
2 VOLUME APPLICATION          - Perform volume functions
X EXIT                        - Terminate ISMF

USE HELP COMMAND FOR HELP; USE END COMMAND TO EXIT.
    
```

Figure 15. ISMF—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 16 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 16. 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 36 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 13 on page 33.
2. Press the ENTER key to get the ISMF short error message. For an example see Figure 14 on page 33.
3. Enter HELP to get the ISMF long error message. For an example see Figure 15 on page 34.
4. Enter HELP again to get the help panel that defines the problem further. For an example see Figure 16 on page 34 above.

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” on page 44 in the related publication *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 17.
6. If the message starts with any of these prefixes, use the manual indicated in the following table to determine the recommended action.
7. Turn to “ISMF—Module Keyword” on page 52.

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

Figure 17. ISMF—Message Prefixes for Other Products

## VSAM—Message Keyword

### 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 52.

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" on page 44 in the related publication *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 75.

---

## VSAM—Message Keyword

### Procedure

1. A broken data set may cause one of the following messages:

Message	Explanation
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. To determine whether you have a broken data set, use the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publications *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)* and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Struc-

tural Errors” in the publication *VSAM Administration Guide*. The EXAMINE command provides details about the nature of data set damage.

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

**MSGIDC3302I**

3. Turn to “VSAM—Modifier Keywords” on page 83.

---

## 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 64 and go to the DADSM/CVAF-related "Incorrect Output Failure Modifier Keywords Procedure" on page 70 to identify appropriate 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 and 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:

<b>Component</b>	<b>Procedure</b>
Device Console Services	Turn to "Device Console Services—Incorrect Output Keyword" on page 40
ISMF	Turn to "ISMF—Incorrect Output Keyword" on page 41
Media Manager	Turn to "Media Manager—Incorrect Output Keyword" on page 42
O/C/EOV (Common)	Turn to "Open/Close/End of Volume (Common)—Modifier Keywords" on page 82
VSAM Block Processor or Record Management	Turn to "VSAM Block Processor/Record Management—Incorrect Output Keyword" on page 43
VSAM Catalog Management	Turn to "VSAM Catalog Management—Incorrect Output Keyword" on page 45
All Other DFP Components	Turn to "Nonspecific DFP Components—Modifier Keywords" on page 85

---

## Device Console Services—Incorrect Output Keyword

### 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 DFP Components—Module Keyword" on page 62.

---

## 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 75.

---

## 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:

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

Incorrect output may be the result of a previous failure.

### Procedure

1. If expected output is missing or different from that requested, 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 48.
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 48.

---

## VSAM—Incorrect Output Keyword

### VSAM Block Processor/Record Management—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 is often caused by a previous failure. Examine the system and console logs for failure-related abends, messages, or return codes. A broken 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 record management provides return codes in register 15 and reason codes in both the access method control block (ACB) and 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 *VSAM Administration: Macro Instruction Reference* 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', append the value to the keyword prefix RC and specify the keyword as shown:

**RC000C0010**

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

Some incorrect output failures involve a broken VSAM data set. To determine whether you have a broken data set, use either IEHLIST or the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publications *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)* and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors" in the publication *VSAM Administration Guide*. The EXAMINE command provides details about the nature of data set damage.

If these service aids indicate that the data set is *not broken*, inform the IBM Support Center if you call for assistance. If they indicate that the data set is

**VSAM—Incorrect Output Keyword**

*broken*, 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 broken 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):

2D08009C	9208009C	A608009C	A708009C
9108009C	D808009C	E08009C	D708009C
2A080020	2B080020	2C080020	DB080020
DF080020			

- 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 broken, rebuild it as directed at "VSAM—Record Management Broken Data Sets" on page 358 in the related publication *DFP Diagnosis Reference*, and rerun the job.
5. Turn to "VSAM—Modifier Keywords" on page 83.

## 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 *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)* to obtain a complete listing of the catalog.
2. Use the IEHLIST program as described in the publication *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 *Access Method Services Reference (Integrated Catalog)* to determine whether the 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 publications *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)*, and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster For Structural Errors," in the publication *VSAM Administration Guide* 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 broken*, inform the IBM Support Center if you call for assistance. If they indicate that the catalog *is broken*, 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 83.

---

## Performance Keyword

Use this section to define the performance keyword when you suspect that a 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 or 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 DFP component.
6. Turn to "Component Identification Keyword" on page 86.

---

## Documentation Keyword

Use this section when you encounter incorrect or incomplete information in a 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 publication 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 64.
- You should be able to identify 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 18.
- 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:

Component	Procedure
VSAM Catalog Management	Turn to "VSAM Catalog Management—Module Keyword" on page 60
DADSM/CVAF	Turn to "DADSM/CVAF—Module Keyword" on page 49
DFP Common Services	Turn to "DFP Common Services—Module Keyword" on page 51
ISMF	Turn to "ISMF—Module Keyword" on page 52
Media Manager	Turn to "Media Manager—Module Keyword" on page 56
Open/Close/End of Volume	Turn to "Open/Close/End of Volume (Common)—Module Keyword" on page 57
SAM	Turn to "SAM—Module Keyword" on page 59
All other DFP components	Turn to "Nonspecific DFP Components—Module Keyword" on page 62

Figure 18. Building the Module Keyword

---

## 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" on page 3, in the related publication *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 69. For **WAIT** or **LOOP** types-of-failure, turn to "Release Level Keyword" on page 88.
5. If the module name begins with the letters ICV, CVAF is the failing component. At "CVAF Module-to-Function Cross-Reference" on page 5, in the related publication *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 69. For **WAIT** or **LOOP** types-of-failure, turn to "Release Level Keyword" on page 88.
6. If neither Step 4 nor Step 5 has 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:

## DADSM/CVAF—Module Keyword

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 69. For **WAIT** or **LOOP** types-of-failure, turn to “Release Level Keyword” on page 88.

### Message Type-of-Failure

1. Specify the module keyword using the DADSM or CVAF module name identified at “DADSM/CVAF—Message Keyword” on page 31.

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

IGG020P2

2. Turn to “DADSM/CVAF—Modifier Keywords” on page 69.

---

## DFP Common Services—Module Keyword

Use this section to build the module keyword for the DFP 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 Figure 8 on page 47 of the related publication *DFP Diagnosis Reference* for a sample entry containing PDA information. See "DFP Common Services—Problem Determination Area (PDA)" on page 36 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 appropriate 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 "DFP Common Services—Modifier Keywords" on page 74.

## 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 75

### 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 Indicated By	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 53
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 54

See “Determining How ISMF Handles Abends and Takes Dumps” on page 42 in the related publication *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 19.

```

14:37 ***** ISMF ERROR ***** - APPLICATION(DGT1 - DATA SET); FUNCTION(DGTFCPTR)
14:37 - ISMF 2.3.0 FMID HDP2230 USERABEND CODE 0122
14:37 - MODULE NAME DGTFDS00 EPA 01C8DB00 PSW 078D1000 80023534
14:37 - R0 80000000 R1 8000007A R2 01CE2668 R3 00000001
14:37 - R4 00000001 R5 01CC0D28 R6 00027CB8 R7 00030B10
14:37 - R8 00000000 R9 0002E7A0 R10 01C6A304 R11 01CE3B24
14:37 - R12 800232A4 R13 0002E7A0 R14 800234CC R15 00000000
    
```

Figure 19. 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 **DGTFDS00**, specify the module keyword as shown:

**DGTFDS00**

- b. Turn to “ISMF—Modifier Keywords” on page 75.
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 54. If you still cannot determine the module name, turn to “ISMF—Modifier Keywords” on page 75.

### 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 “ISMF’s Use of the ISPF Log” on page 44 in the related publication *DFP Diagnosis Reference* for a description of the ISPF log. The format of the ISPF symptom dump is shown in Figure 20.

```
14:45      ISP SUBTASK ABEND      - VS 03.8 ISP 2.2.0000 ABEND CODE = 00007A PSM FF85000D 00000000
14:45      - 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 00027CBB R7 00030B10
14:45      ABEND                  - R8 00000000 R9 0002E7A0 R10 01C6A304 R11 01CE3B24
14:45      - R12 80036534 R13 0002E7A0 R14 8003675C R15 00000000
```

Figure 20. 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 **DGTFDS00** (this is *not* the case in the sample ISPF symptom dump shown in Figure 20 above), specify the module keyword as shown:

**DGTFDS00**

- b. Turn to “ISMF—Modifier Keywords” on page 75.
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 54. If you still cannot determine the module name, turn to “ISMF—Modifier Keywords” on page 75.

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 21 for a sample save area trace.

```

SAVE AREA TRACE

DGTFTCPR 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 ISDVEL.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 21. 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 21 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.
4. The name of the failing module is located in the row above its EPA (the one that you found in Step 3) 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 21, the module name for the failure is highlighted.

5. Specify the module name as the module keyword.

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

**DGTFTCMD**

6. Turn to “ISMF—Modifier Keywords” on page 75.

---

## Media Manager—Module Keyword

Forabend, 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 Figure 32 on page 88 in the related publication *DFP Diagnosis Reference* for a sample media manager dump.

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" on page 90 in the related publication *DFP Diagnosis Reference*.

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

**ICYCCHRR**

2. Turn to "Modifier Keywords" on page 64.

---

## 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 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 29 on page 86) and turn to "SAM—Module Keyword" on page 59 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 DFP service that abended. The next RB represents the failing 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 82.

#### 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" on page 92 in the related publication *DFP Diagnosis Reference* for details.)

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

## Open/Close/EOV (Common)—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 82.

### 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 82.

---

## 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 86.

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 0037 for jobs that issued an EOVSVC. See the sample formatted dump in Figure 9 on page 20 to locate the field.
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 64.

## VSAM Catalog Management—Module Keyword

Use this section to build the module keyword for any of the three 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 20 or the sample R/TM work area summary in Figure 10 on page 23), scan the translated EBCDIC output in the right-hand column for a module name. (In the sample formatted dump portion in Figure 22 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 C8C4D7F2 F2F3F040 D5D6D5C5 *..00.IGG0CLAT08.31.84HDP2230 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.....0.....*
000193A0 00 45E0CDF6 D2F7B314 B31C9500 B0074780 C06292A4 B00D45E0 CD2E5850 B4105050 *...6K7.....*
    
```

Figure 22. 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 23 on page 61 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 83.

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	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHAHDP2230 NONE .....
01AEA9E0	00CC6B88	C9C7C7F0	C3D3C8C2	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH9HDP2230 NONE .....
00CCAA00	00CC5760	C9C7C7F0	C3D3C8C3	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHCHDP2230 NONE .....
01AEA200	00CC74D8	C9C7C7F0	C3D3C8C4	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...QIGG0CLHDHDP2230 NONE .....
01AEA400	00CC7A20	C9C7C7F0	C3D3C8C5	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHEHDP2230 NONE .....
01AEA600	00CC7BF0	C9C7C7F0	C3D3C8C6	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHFHDP2230 NONE .....
01AEA800	00CC8288	C9C7C7F0	C3D3C8E5	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLHVHDP2230 NONE .....
01EAAA00	00CC8428	C9C7C7F0	C3D3C8F0	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH0HDP2230 NONE .....
01EAA600	00CC8A60	C9C7C7F0	C3D3C8F1	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH1HDP2230 NONE .....
01EAA800	00CC8B88	C9C7C7F0	C3D3C8F2	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLH2HDP2230 NONE .....
01EAB000	00CC8E70	C9C7C7F0	C3D3E7C1	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLXAHDP2230 NONE .....
01EAB200	00CC82B8	C9C7C7F0	C3D3E7C2	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLXBHDP2230 NONE .....
01EAB400	00CC8C98	C9C7C7F0	C3D3E7C3	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...H.IGG0CLXCHDP2230 NONE .....
01EAB600	00CCD200	C9C7C7F0	C3D3E7C4	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...K.IGG0CLXDHDP2230 NONE .....
01EAB800	00CCE180	C9C7C7F0	C3D3E7C5	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLXEHP2230 NONE .....
01EABA00	00CCE7D8	C9C7C7F0	E3D9D4F1	C8C4D7F2	F2F3F040	61F0F461	40404040	00000000	00000000	*...XQIGG0TRM1HDP2230 NONE .....
01EABC00	C9C7C7F0	C3D3E7F0	000098C8	00081000	00000084	00000000	00000000	00000000	00000000	*IGG0CLX0...H.....*
01EABE00	000098C8	C9C7C7F0	C3D3E7F0	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...HIGG0CLX0HDP2230 NONE .....
01EAC000	0000AC30	C9C7C7F0	C3D3C6F0	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF0HDP2230 NONE .....
01EAC200	0000BFE8	C9C7C7F0	C3D3C1C8	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...YIGG0CLAHDP2230 NONE .....
01EAC400	0000D628	C9C7C7F0	C3D3C1F3	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...O.IGG0CLA3HDP2230 NONE .....
01EAC600	0000F5C0	C9C7C7F0	C3D3C6F5	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...5.IGG0CLF5HDP2230 NONE .....
01EAC800	00010900	C9C7C7F0	C3D3C5C7	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLEGHDP2230 NONE .....
01EACA00	00011DB0	C9C7C7F0	C3D3C6F4	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF4HDP2230 NONE .....
01EACC00	00012CD8	C9C7C7F0	C3D3C6F6	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...QIGG0CLF6HDP2230 NONE .....
01EACE00	00014768	C9C7C7F0	C3D3C2F6	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLB6HDP2230 NONE .....
01EAD000	00015218	C9C7C7F0	C3D3C5C1	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLEAHDP2230 NONE .....
01EAD200	00017288	C9C7C7F0	C3D3C6E3	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLFTHDP2230 NONE .....
01EAD400	00018990	C9C7C7F0	C3D3C5C8	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLEHHP2230 NONE .....
01EAD600	00019320	C9C7C7F0	C3D3C1E3	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLATHDP2230 NONE .....
01EAD800	0001AA00	C9C7C7F0	C3D3C6F1	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF1HDP2230 NONE .....
01EADA00	0001B460	C9C7C7F0	C3D3C6F3	C8C4D7F2	F2F3F040	D5D6D5C5	40404040	00000000	00000000	*...IGG0CLF3HDP2230 NONE .....
.										
.										
.										

Figure 23. VSAM Catalog Management—Sample CAS SVC Dump of CSECT Address Map

---

## Nonspecific DFP Components—Module Keyword

Use this section to build the module keyword for 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* 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 DFP service that abended. The next RB represents the failing 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 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 64.

#### 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 26), determine which module resides at that address, and specify the entire module name as the module keyword.
2. Turn to "Modifier Keywords" on page 64.

### 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 DFP Components—Modifier Keywords” on page 85.

## 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" 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 86.
3. For all other types-of-failure, select the procedure for the failure-related component from the following table:

Component	Procedure
VSAM Catalog Management	Turn to "VSAM Catalog Management—Modifier Keywords" on page 83
DADSM/CVAF	Turn to "DADSM/CVAF—Modifier Keywords" on page 69
DFP Common Services	Turn to "DFP Common Services—Modifier Keywords" on page 74
ISMF	Turn to "ISMF—Modifier Keywords" on page 75
Media Manager	Turn to "Media Manager—Modifier Keywords" on page 78
Open/Close/End of Volume (Common)	Turn to "Open/Close/End of Volume (Common)—Modifier Keywords" on page 82
All other DFP components	Turn to "Nonspecific DFP Components—Modifier Keywords" on page 85

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 nnnnn	Use OYnnnnn or OZnnnnn 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
CMDREJ	Command reject (hardware sense bit)
*Command reject	Use CMDREJ
*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 nnnn	Use D/Tnnnn (for example, D/T3380)
D/Tnnnn	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-n DSCB	Use FnDSCB
FnDSCB	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

## Modifier Keywords

Keyword	Meaning
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). <b>Note:</b> 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 DFP
*Out of sequence	Use OUTOFSEQ
OUTOFSEQ	Record keys out of sequence
OVR	Overrun (hardware sense bit)
PROGCK	Program check
*Program check	Use PROGCK
*PTF nnnnn	Use UYnnnnn or OZnnnnn as appropriate (for example, UY12345 or UZ12345)
*Publications	Do not use hyphens (for example, GC264149)

Keyword	Meaning
RCnnn	Return code, reason code, function code, error code, and so forth (exactly as the system presents it)
*Reason Code	Use RCnnn (exactly as the system presents it)
RECMGT	Record management function of VSAM
*Record Management	Use RECMGT
*Record Management Trace	Use RMTRACE
REGnn	General purpose register (use two decimal digits, for example, REG 02 or REG14)
*Registers	Use REGnn for general purpose registers, CREGnn for control registers, and FPREGnn for floating point registers (nn is either one or two decimal digits with leading zeros.)
*Release Level	Use Rnnn
*Return Code	Use RCnnn (exactly as the system presents it)
RMTRACE	Record management trace facility of VSAM
RPLFDBWD = nnnnnnnn	RPL feedback-word (nnnnnnnn is four hexadecimal 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
SVCnn	Supervisor call Instruction (nn is decimal, no leading zeros, or use 0Ann (nn is hexadecimal))
*Supervisor Call	Use SVCnn or 0Ann
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

## Modifier Keywords

Keyword	Meaning
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 (nn 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.

### 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 86.

**Table of DADSM Functions**

Function	Subfunction	Description
ALLOC	INIT	Initializes space allocation and routes requests to the appropriate subfunction
	NONIALL	Allocates space for nonindexed sequential access method (ISAM) data sets and virtual storage access method (VSAM) data spaces
	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
SCRATCH		Deletes a data set or VSAM data space
PRLSE		Frees unused space
RNAME		Renames data sets
OBTN		Reads DSCBs from the VTOC
LSPACE		Calculates available space on a direct access volume and writes SMF record 19
PRTCT		Maintains the system password data set

Function	Subfunction	Description
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
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
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 as described at "CVAF—GTF Trace of Events" on page 8 in the related publication *DFP Diagnosis Reference* to trace the CVAF events.
  - 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 86. 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 86.
- d. See “Table of DADSM Functions” on page 69 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 86.

- e. See “Table of CVAF Functions” on page 70 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 72. 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 86.
- 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.

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	—

Figure 24. CVAF Function Byte Values in the CVPL

See "Table of CVAF Functions" on page 70 for a detailed description of the operations performed by the CVAF functions.

- i. 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 86.

### **Message Failure Modifier Keywords Procedure**

1. Using the module name determined at “DADSM/CVAF—Message Keyword” on page 31, locate that module name in either “DADSM Module-to-Function Cross-Reference” on page 3 or “CVAF Module-to-Function Cross-Reference” on page 5 in the related publication *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 86.

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## DFP Common Services—Modifier Keywords

Use this section to build the modifier keywords for DFP 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 Figure 8 on page 47 of the related publication *DFP Diagnosis Reference* for a sample entry containing PDA information. See “DFP Common Services—Problem Determination Area (PDA)” on page 36 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 Figure 8 on page 47), specify the modifier keywords as shown:

**IGBDIS01 RC10 RC038**

2. Turn to “Component Identification Keyword” on page 86.

## 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” on page 44 in the related publication *DFP Diagnosis Reference* for a description of the ISPF log and ISMF logging options.

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 25 to determine which log information to specify as modifier keywords.
  - For abend failures, specify the module you determined at “ISMF—Module Keyword” on page 52 as the module name keyword.
  - For message-indicated failures, specify the return code and reason code you determined at “ISMF—Message Keyword” on page 33 as modifier keywords. (Specify them exactly as the system presented them.)

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

Figure 25 (Part 1 of 2). ISMF—Information Needed to Build the Modifier Keywords

Type-of-Failure	Modifier
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

Figure 25 (Part 2 of 2). ISMF—Information Needed to Build the Modifier Keywords

- If you cannot relate an ISPF log entry to the failure (incorrect output, wait, or loop types-of-failure), use Figure 26 to determine which modifier keywords to specify.

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

Figure 26. ISMF—Modifier Keywords to Use When the Log Is Not Available

- Continue at “Adding Modifiers to the Keyword String.”

**Adding Modifiers to the Keyword String**

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

The sample log entry in Figure 27 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 25 on page 75). 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 - DGTDS004); LAST PANEL(DGTDDDS1)
                          - SERVICE(DGTFDS04); FEEDBACK(NONE)
    
```

Figure 27. 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 27 on page 76 as follows:

**MSGDGTDS004 DATA SET SELECT RC8 RC6 DGTFDS03 GENAARAY DGTDDDS1 DGTDS004**

3. Turn to “Component Identification Keyword” on page 86.

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

6. One of the instructions shown in Figure 28 on page 79 follows this sequence of instructions. It identifies the media manager function invoked by the caller.

Machine Language Instruction	Assembler Language Instruction	Modifier (Function) Keyword
58F0F008	L 15,8(,15)	INIT
58F0F00C	L 15,12(,15)	RDWR
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

Figure 28. Instruction-to-Function Cross-Reference

**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 86.
- 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 SUMDUMP parameter of the AMDPRDMP program. If ICYFRR issued the SDUMP, see Figure 32 on page 88 in the related publication *DFP Diagnosis Reference* for an example of a summary dump.

- 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 Figure 32 on page 88 in the related publication *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

## Media Manager—Modifier Keywords

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
'08'	PFMT
'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 86.

## 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 thanabend, 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
<b>CNVT</b>	Converts relative byte addresses to absolute device addresses (CCHHR), and vice versa. The CNVT function uses modules ICYCCHHR and ICYRBA.
<b>FMTWR</b>	Processes requests to format and write tracks sequentially. The FMTWR function uses modules ICYABN, ICYABN, ICYBLDCP, ICYBLIST, ICYDIE, ICYFW, ICYNRM, ICYPGAD, ICYRBA, and ICYSTOR.
<b>INIT</b>	Initializes the media manager control blocks. The INIT function uses modules ICYIEDB, ICYILPMB, and ICYINIT.
<b>MMSYSTEM</b>	Manages media manager resources. The MMSYSTEM function uses modules ICYELE, ICYFRR, and ICYPURG.
<b>PFMT</b>	Processes requests to preformat tracks within a range of relative byte addresses. The PFMT function uses modules ICYCCHHR, ICYPCFP, ICYPCFMT, ICYRBA, ICYSTOR, ICYPCFDIE, and ICYPCFAPP.
<b>RDWR</b>	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 86.

---

**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 the sixth characters module name identify the function. Select a function from the following two lists:

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

**List of First Load Modules**

<b>Module Name</b>	<b>Function Keyword</b>
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 86.

---

## 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.)
  - 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.

#### Access Method Services Commands

ALTER  
BINDDATA  
BLDINDEX  
CHKLIST  
CNVTCAT  
DEFINE ALIAS  
DEFINE ALTERNATE INDEX  
DEFINE CLUSTER  
DEFINE GDG  
DEFINE MASTERCATALOG  
DEFINE NONVSAM  
DEFINE PAGESPACE  
DEFINE PATH

## VSAM—Modifier Keywords

DEFINE SPACE  
DEFINE USERCATALOG  
DELETE  
DIAGNOSE  
EXAMINE  
EXPORT  
EXPORTRA  
IMPORT  
IMPORTRA  
LISTCAT  
LISTCRA  
LISTDATA  
PRINT  
REPRO  
RESETCAT  
SETCACHE  
VERIFY

**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 86.

---

## Nonspecific DFP Components—Modifier Keywords

Use this section to build the modifier keywords for 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 64 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 86.

## Component Identification Keyword

Use this section to identify the suspected failing Data Facility Product 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 88.

Component Name	Component Identification Keyword
Access Method Services	566528430
AMBLIST	566528412
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
DFP Common Services	566528460
ICAPRTBL	566528435
IEBCOMPR	566528443
IEBCOPY	566528446
IEBDG	566528442
IEBEDIT	566528449
IEBGENER	566528447
IEBIMAGE	566528444
IEBISAM	566528441
IEBPTPCH	566528437
IEBUPDTE	566528448
IEHATLAS	566528440
IEHINITT	566528438
IEHLIST	566528405
IEHMOVE	566528407
IEHPROGM	566528406
IFHSTATR	566528439

<b>Component Name</b>	<b>Component Identification Keyword</b>
Integrated Catalog Facility and VSAM Catalog	566528418
ISAM	566528434
ISMF	566528461
Linkage Editor	566528408
Loader	566528411
Media Manager	566528415
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
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

---

## Release Level Keyword

Use the following procedure to determine the release level of the DFP modules on your system.

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

**Note:** Although 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 DFP release level:

- Method A—Using SMP or 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 not determine the module name, bypass this procedure and turn to "Searching with the Keyword String" on page 3.

#### Method A—Using SMP or SMP/E

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

1. List the control data set (CDS) or the consolidated software inventory (CSI).
  - a. To list the CDS, use the following SMP4 control statement:

```
LIST CDS MOD (name) XREF.
```

**Notes:**

- 1) If you run the above control statement without identifying a specific module name, the system lists all modules. If possible, tailor your statement to a specific module name.
- 2) You may select multiple module names with a single control statement by using the following command syntax:

```
LIST CDS MOD (name,name) XREF.
```

- 3) Be sure to include the *period* at the end of the control statement.

- b. To list the appropriate target zone of the CSI, use 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 CDS or 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 release level. For example, if the FMID is **HDP2230**, the release level is **230**.
4. When you determine the release level, go to "Building the Release Level Keyword," below.

**Note:** For more details on using this procedure, see the publications *SMP Programmer's Guide* and *SMP/IE 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 release level. If the FMID is **HDP2230**, the release level is **230**.
3. When you determine the release level, go to "Building the Release Level Keyword," below.

---

### Building the Release Level Keyword

1. To build the keyword, append the release level to the keyword prefix **R**.

**Example:** If the release level is **230**, specify the release level keyword as shown:

**R230**

2. Turn to "Service Level Keyword" on page 90.

---

## 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 or 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 or SMP/E

1. For **SMP4**, list the control data set (CDS). The control statement is:

```
LIST CDS MOD (name) XREF.
```

where *name* is the module name. You may specify more than one module name in the control statement:

```
LIST CDS MOD (name, name) XREF.
```

For **SMP/E**, list the appropriate target zone of the consolidated software inventory (CSI). The control statements are:

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

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

2. Using the output listing, locate the name of the failure-related module in the **NAME** column of the CDS or CSI.
3. 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*.

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

- a. For **SMP4**, list the **SYSMODs** as follows: The control statement is:

```
LIST CDS SYSMOD (ptf#).
```

where **ptf#** is the desired PTF number. You may specify more than one PTF number in the control statement:

```
LIST CDS SYSMOD (ptf#,ptf#).
```

For **SMP/E**, list the **SYSMODs** as follows: The control statement is:

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

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

5. Go to " Building the Service Level Keyword," below.

#### **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. Go to " Building the Service Level Keyword," below.

#### **Method C—Using the SDUMP Title Page**

1. Locate the service level in the SDUMP header title.
2. Go to " Building the Service Level Keyword," below.

---

### **Building the Service Level Keyword**

1. **Example:** If the service level of the failure-related module is **UZ12345**, specify the service level keyword as shown:

```
UZ12345
```

2. 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)

---

## Glossary

### Acronyms and Abbreviations

The following alphabetized list defines acronyms and abbreviations used in this book or elsewhere during the diagnosis process. The publication *Vocabulary for Data Processing, Telecommunications, and Office Systems* may contain terms not defined here.

- ABEND.** abnormal end
- ABP.** actual block processor (either the IOM module IDA121A2 or the IOM communication vector table)
- ACB.** access method control block
- ACDS.** alternate control data set. A data set used by SMP.
- ADDR.** addressed processing or addressed
- ADR.** same as ADDR
- AIX.** alternate index
- AMB.** access method block
- AMBL.** access method block list
- AMBXN.** access method block extension
- AMDSB.** access method data statistics block
- ANSI.** American National Standards Institute
- APAR.** authorized program analysis report. A report of a problem caused by a suspected defect in a current unaltered release of a program.
- 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
- BCB.** buffer control block
- BDAM.** basic direct access method
- BDW.** block descriptor word
- BIB.** base information block
- BISAM.** basic ISAM
- BLPRM.** resource pool parameter list
- BPAM.** basic partitioned access method
- BSAM.** basic sequential access method
- BSPH.** buffer subpool header
- BUFC.** buffer control block
- BWD.** backward (processing)
- C.** close
- CA.** control area
- CAS.** catalog address space
- CATX.** option to open integrated catalog facility catalog without SVC26
- CAXWA.** catalog auxiliary work area
- CBUF.** control block update facility
- CCA.** catalog communication area
- CCB.** CVAF common block
- CCHHR.** cylinder/cylinder/head/head/record. A DASD volume address designation.
- CCR.** catalog control record
- CCW.** channel command word
- CCX.** catalog communication area extension
- CDE.** contents directory element
- CDS.** control data set. A data set used by SMP.
- CESD.** composite external symbol dictionary
- CFS.** common filter service. 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.
- CHKPT.** checkpoint
- CHR.** checkpoint header record

## Glossary

**CI.** control interval. Also used as an abbreviation for compatibility interface.

**CICB.** catalog integrity control block

**CIDF.** control interval definition field. The 4-byte control-information field at the end of a control interval that gives the displacement from the beginning of the control interval to free space and the length of the free space. If the length is 0, the displacement is to the beginning of the control information.

**CIFWA.** CAS interface work area

**CIPT.** control interval pointer table

**CISA.** catalog integrity save area

**CIST.** control interval substitution table

**CLW.** close work area (VSAM - mapped by IDACLWRK)

**CLWA.** close work area (common OPEN/CLOSE/EOV)

**CMB.** cluster management block

**CNV.** control interval or control-interval processing

**CPA.** channel program area

**CPL.** catalog parameter list

**CRA.** catalog recovery area. An entry-sequenced data set that exists on each volume owned by a recoverable catalog, including the catalog volume itself. The CRA contains self-describing records as well as duplicates of catalog records that describe the volume.

**CRT.** CAS resource table

**CSA.** common service area

**CSECT.** control section

**CSI.** consolidated software inventory. A data set used by SMP/E.

**CSL.** core save list

**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

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

**CVPL.** CVAF parameter list

**CVT.** communication vector table

**C/R.** checkpoint/restart

**DADSM.** direct-access device space management

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

**DCB.** data control block

**DCE.** device class extension

**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.

**DDNAME.** data definition name

**DDNT.** ddname table

**DEB.** data extent block

**DECB.** data event control block

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

**DFDSS.** data facility data set services

**DFP.** Data Facility Product

**DIE.** disabled interrupt exit

**DIR.** direct processing

**DIRF.** DADSM interrupt recording facility

**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.

**DIWA.** data insert work area

**DOC.** keyword for documentation problem

**DOC APAR.** An authorized program analysis report produced for a documentation problem.

**DOS.** disk operating system

**DSAB.** data set association block

**DSCB.** data set control block

**DSDR.** data set descriptor record

**DSECT.** dummy section

**DSL.** DEB save list

**DSNAME.** data set name

**DSORG.** data set organization

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

**DTT.** define tracking table

**DVCT.** device characteristics table.

**EBCDIC.** extended binary-coded-decimal interchange code

**ECB.** event control block

**ECKD.** extended count-key-data architecture

**ECSA.** extended common service area

**EDB.** extent definition block

**EDT.** eligible device table

**ENDREQ.** end the request

**ENF.** event notification facility

**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. 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.

**EOB.** end of block

**EOD.** end of data

**EOF.** end of file

**EOM.** end of module

**EOV.** end of volume

**EP.** external procedure 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. A task recovery routine that provides recovery for those programs that run enabled, unlocked, and in task mode.

**EUNLD.** unload parameter list

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

**EXCD.** exceptional conditions

**EXCP.** execute channel program. An Assembler language macro instruction that requests the initiation of the I/O operations of a channel program.

**EXLST.** exit list

**E/P.** entry point

**F.** fixed. Used to describe record format.

**FBQE.** free block queue element

**FCL.** filter criteria list

**FDT.** function data table (access method services)

**FKS.** full key search

**FLIH.** first level interrupt handler

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

**FOE.** fixed ownership element

**FPL.** catalog field parameter list

**FQE.** free queue element

**FREEMAIN.** An Assembler language macro instruction that releases one area of main storage that had

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previously been allocated to the job step as a result of a GETMAIN macro instruction.

**FRR.** functional recovery routine

**FS.** free space

**FSR.** function support routine (access method services)

**FVT.** catalog field vector table

**FWD.** forward (processing)

**GAT.** generation aging table

**GC.** type code (group code)

**GDG.** generation data group. A collection of historically related data sets.

**GDS.** generation data set

**GDT.** global data table (access method services))

**GEN.** generic key search

**GETMAIN.** An Assembler language macro instruction that is used to allocate an area of main storage for use by the job step task.

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

**GSR.** global shared resources. (See shared resources.)

**GTF.** generalized trace facility. A service aid that traces selected system events.

**HEB.** header element block

**ICB.** interrupt control block

**ICE.** index control entry. The first entry of each index of the CVOL catalog. This entry contains all control information about the index.

**ICIP.** improved control-interval processing

**ICKDSF.** device support facility

**ICWA.** index create work area

**ID.** identifier. Also used as an abbreviation for identification.

**IDAL.** indirect data-address list (real page list)

**II.** ISAM Interface

**IICB.** ISAM interface control block

**ILE.** Index link entry. The last entry of each block of the CVOL catalog, used to link blocks of one index together in a chain.

**IMWA.** index modification work area

**INCORROUT.** keyword for incorrect output.

**IOB.** input/output block

**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. A CVOL catalog entry that attaches a lower-level index to the index in which it is found.

**IPL.** initial program load

**IQE.** interrupt queue element

**IRB.** interrupt request block

**IRF.** interrupt recognition flag

**ISAM.** indexed sequential access method

**ISMF.** interactive storage management facility

**ISO.** International Organization of Standards

**ISPF.** interactive system productivity facility

**I/O.** input/output

**JCL.** job control language.

**JCT.** job control table. A problem-oriented language (designed to express statements in a job) that is used to identify the job or describe its requirements to an operating system.

**JES.** job entry subsystem

**JESCT.** job entry subsystem control table

**JFCB.** job file control block

**JSCB.** job step control block

**JSTCB.** job step task control block

**K.** 1024 decimal (a kilobyte = 1024 bytes)

- KEQ.** search on key equal
- KEY.** keyed accessing
- KGE.** search on key greater or equal
- KSDS.** key sequenced data set
- L.** link
- LD.** label definition
- LDS.** linear data set
- 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.
- LLE.** load list element
- LLOR.** least length of record (that contains all key fields)
- LPA.** link pack area
- LPMB.** logical-to-physical mapping block
- LR.** label reference
- LSQA.** local storage queue area
- LSR.** local shared resources. (See shared resources.)
- MACR.** macro reference
- MBBCHHR.** absolute disk address. A pattern of characters that, without further modification, identifies a unique DASD storage location.
- MBCB.** main SVRB pool control block
- 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
- MODESET.** A Supervisor macro instruction used to change the system status by altering the PSW key or the mode indicator.
- MSS.** mass storage system
- MSVI.** mass storage volume inventory
- MVS.** Multiple Virtual Systems
- MWA.** module work area
- n.** integer number
- NCP.** number of channel programs
- NIP.** nucleus initialization program
- NSI.** next sequential instruction
- NSL.** nonstandard label. Used to describe a label option for magnetic tape devices.
- NSP.** next string position
- NUP.** no update
- O.** open
- O/C/EOV.** Open/Close/End of Volume
- 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)
- PC.** private code
- PCB.** page control block
- PCCB.** private catalog control block
- PCTT.** private catalog termination table
- PDA.** problem determination area. An area provided by the calling program and filled in with diagnostic information by the service.
- PDS.** partitioned data set
- PDSCB.** partial data set control block
- 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

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**PIRL.** purge I/O restore list

**PLH.** placeholder list

**PLPA.** pageable link pack area

**PO.** partitioned organization. Used to describe data set format.

**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.** Programming Systems Representative

**PSW.** program status word. An area in storage used to indicate the order in which instructions are executed, and to hold and indicate the status of the system.

**PTF.** program temporary fix. A temporary solution or bypass of a problem diagnosed by IBM Support Center as the result of a defect in a current unaltered release of the program.

**PVT.** page vector table

**QCB.** queue control block

**QDB.** queue descriptor block

**QISAM.** queued ISAM

**QSAM.** queued sequential access method

**RA.** record area

**RAB.** record area block

**RACF.** Resource Access Control Facility

**RB.** request block

**RBA.** relative byte address. 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.

**RDF.** record definition field. A 3-byte control-information field to the left of the CIDF in a VSAM control interval that gives the length of a record in the control interval or the number of consecutive records having the same length. This term is also used to describe a DASD location relative to the beginning of a data set, in the form TTR.

**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.

**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.

**RIM.** resource initialization module

**RLD.** relocation dictionary

**R/M.** record management

**RMID.** replace module identifier. Used by SMP and SMP/E.

**Rn.** general-purpose register n

**RPL.** request parameter list

**RPLE.** request parameter list extension

**RPS.** rotational position sensing

**RRDS.** relative record data set

**RTN.** routine

**R0.** record zero. Track capacity record on a DASD device.

**R/TM.** recovery/termination manager. A system routine that monitors the flow of software recovery processing by handling all abnormal termination of tasks and address spaces.

**SAF.** system authorization facility

**SAM.** sequential access method

**SAMB.** sequential access method block

**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.

- SCB.** STAE control block
- SCIB.** search compressed index block
- SCRA.** catalog recovery area in system storage
- 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.
- SCT.** step control table
- SCVT.** secondary communication vector table
- SD.** section definition
- SDB.** structured data base. 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 from user-entered data.
- SDW.** segment descriptor word
- SDWA.** STAE diagnostic work area. An area containing diagnostic information used for problem determination.
- SEQ.** sequential or sequential processing
- SIO.** start I/O
- SIOD.** supervisor-state I/O driver
- SIOT.** step I/O table
- SIRB.** supervisor interrupt request block
- SKP.** skip sequential or skip sequential processing
- SLIH.** second level interrupt handler
- SLIP.** serviceability level indication processing
- SMF.** System Management Facilities
- SMP.** System Modification Program
- SMP/E.** System Modification Program/Extended
- SPL.** service priority list
- SPQE.** subpool queue element
- SRA.** sphere record area
- SRB.** service request block
- SRM.** system resource manager
- SRR.** serially reusable resource
- SSCR.** subsystem checkpoint record
- SSF.** Software Support Facility. An IBM online data base that contains information about all current APARs (authorized program analysis reports) and PTFs (program temporary fixes).
- SSIB.** subsystem identification block
- SSL.** swap save list
- 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 instruction
- SVRB.** supervisor request block. A system control block containing program status information and general register contents.
- SVT.** supervisor vector table
- SWA.** scheduler work area. Also used as an abbreviation for segment work area.
- SYSCTLG.** The data set name of the CVOL catalog.
- SYSDUMP.** system dump
- TCAM.** telecommunications access method
- TCB.** task control block
- TIOT.** task I/O table
- TQE.** timer queue element
- TSO.** time sharing option
- TTR.** relative track and record address on a direct-access device, where TT represents two hexadecimal digits specifying the track relative to the beginning of the data set, and R is one hexadecimal digit specifying the record on that track.
- U.** undefined. Used to describe record format.

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**UCB.** unit control block. A data area used by MVS/XA for device allocation and for controlling input/output (I/O) operations.

**UCRA.** catalog recovery area in user's storage

**UPD.** update mode (or data modify)

**UPT.** upgrade table

**USAR.** user security-authorization record

**USASI.** USA Standards Institute

**USL.** unscheduled list

**USVR.** user security-verification routine

**V.** variable. Used to describe record format.

**VAT.** valid AMBL table

**VCB.** volume control block. A block of the catalog that identifies as many as 20 volumes containing one data set.

**VCBPE.** volume control block pointer entry. A CVOL catalog entry that identifies a VCB for a named data set.

**VRCORE.** VSAM checkpoint/restart core

**VCRT.** VSAM checkpoint/restart table

**VDSCB.** virtual data set control block

**VGTT.** VSAM global termination table

**VIB.** VTOC information block

**VICE.** volume index control entry. The first entry in the volume index. The VICE describes the volume index and controls space allocation in SYSCTLG.

**VIER.** VTOC index entry record

**VIO.** virtual I/O

**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

**VS.** variable spanned (as used to describe record format)

**VSAM.** virtual storage access method

**VSI.** VSAM shared information

**VSLE.** virtual subarea list (same as PFL or PFPL)

**VSM.** virtual storage manager

**VSRT.** VSAM shared resource table

**VTAM.** Virtual Telecommunications Access Method

**VTOC.** volume table of contents

**VVCR.** VSAM volume control record

**VVDS.** VSAM volume data set

**VVDSWA.** VVDS work area

**VVIC.** (replaced by MSVI)

**VVR.** VSAM volume record

**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.

**WAX.** work area for path processing

**WSHD.** working storage header

**WTG.** where-to-go. The name of a table used to transfer control between common O/C/EOV modules.

**WTO.** write to operator

**WTOR.** write to operator with reply

**WTP.** write to programmer

**WX.** weak external reference

**XCTL.** transfer control. An Assembler language macro that causes control to be passed to a specified entry point.

**XDAP.** execute direct access program

**XPT.** checkpoint

**XPTE.** external page table entry

**XREF.** cross reference

**XSB.** extended status block

## Glossary

### Terms and Expressions

**absolute address.** A pattern of characters that, without further modification, identifies a unique DASD storage location. The format is MBBCCHHR

**Access Method Services.** A multifunction service program that defines VSAM data sets and allocates space for them, converts indexed sequential data sets to key-sequenced data sets with indexes, modifies data-set attributes in the catalog, reorganizes data sets, facilitates data portability between operating systems, creates backup copies of data sets and indexes, helps make inaccessible data sets accessible, and lists data-set records and catalog entries.

**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.

**adcon.** Address constant

**addressed direct access.** The retrieval or storage of a data record identified by its relative byte address, independent of the record's location relative to the previously retrieved or stored record. (See *also* keyed direct access, addressed sequential access, and keyed sequential access.)

**addressed sequential access.** The retrieval or storage of a data record in its entry sequence relative to the previously retrieved or stored record. (See *also* keyed sequential access, addressed direct access, and keyed direct access.)

**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.

**allocated space.** All space allocated (on a device) to a data set.

**allocated used space.** The amount of allocated space that is in use.

**alternate index.** A collection of index entries organized by the alternate keys of its associated base data records.

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

**application.** As used in this publication, 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.

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

**blkref field.** A field the user specifies in a program and that contains either the relative or the actual address of the record the user wants access to. If it is the relative address, the BDAM address conversion routines convert it to an actual address (MBBCCHHR). 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 MBBCCHHR 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 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 the current block size. For VSAM data set, 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 pool.** A continuous area of virtual storage divided into buffers.

**candidate volume.** A direct-access storage volume that has been defined in a VSAM catalog as a VSAM volume; VSAM can 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.** (See master catalog and user catalog.)

**catalog recovery area.** (See CRA.)

**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.

**cluster.** A combination of related VSAM data sets, identified by one name in a VSAM catalog and requiring a single DD statement. A key-sequenced data set and its index form a cluster; an entry-sequenced data set alone forms a cluster.

**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.

**compendium.** A compendium gathers together and presents in concise form all the essential facts and details about a VSAM functional unit.

**component.** As used in this book, a group of modules that perform a function, such as I/O Management.

**compression.** (See key compression.)

**control area.** 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 interval.** A fixed-length area of auxiliary-storage space in which VSAM stores records and distributes free space. It is the unit of information transmitted to or from auxiliary storage by VSAM, some integer multiple of blocksize.

**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.

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

**data record.** A collection of items of information from the standpoint of its use in an application and not from the standpoint of the manner in which it is stored (see also stored record).

**data security.** Prevention of access to or use of data or programs without authorization. As used in this publication, the protection 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 in key sequence or in 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 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.

**dequeue.** To remove a request for a resource from a list of requests.

**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.)

**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.

**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 MBCCCHHR).

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

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

**entry.** A logical record of a catalog.

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

**entry-sequenced data set.** A data set whose records are loaded without respect to their contents, and whose relative byte addresses 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 data set SYSCTLG for later analysis.

**exclusive control.**

- 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. When requested by the user, exclusive

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control 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* (all other WRITE-add requests). The purpose of getting exclusive control is the same in both of these cases: to prevent multiple WRITE-add requests from updating the same dummy record or writing over the same available space on a 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.

**Ext Proc.** external procedure

**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, starting with the first block on the track containing the block address operand specified in the request macro, and continuing 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 allocated on a direct-access storage volume, reserved for a particular data space or data set.

**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."

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

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

**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 space.** (See distributed free space.)

**generation.** One member of a generation data group.

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

**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.

**global storage.** Virtual storage that is not part of a user's private address space.

**high-level name.** The first component of a qualified data set 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 gives the location of another index record in the same level that contains the next key in collating sequence; used for keyed sequential access.

**index.** A table in the CVOL catalog structure that is used to locate data sets. For VSAM, this term is also used to describe 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 entry.** A key and a pointer paired together, where the key is the highest key (in compressed form) entered in an index record or contained in a data record in a control interval, and the pointer gives the location of that index record or control interval.

**index level.** A set of index records that order and give the location of records in the next lower level or (sequence set record) that give the location of control intervals in the control area that it is associated with.

**index record.** A collection of index entries that are retrieved and stored as a group. (Contrast to data 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; 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.

**Int Proc.** internal procedure

**integrity.** (See data integrity.)

**interactive storage management facility.** A facility of MVS/XA which allows users and storage administrators access to the storage management functions of DFSS and DFHSM.

**interactive system productivity facility.** 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.)

**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 key-sequenced data set with an index.

**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. (See *also* key field and generic key.)

**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 an index record; reduces storage space for an index.

**key field.** A field located in the same position in each record of a data set, whose contents are used for the key of a record.

**key sequence.** The collating sequence of data records, determined by the value of the key field in each of the data records. May be the same as, or different from, the entry sequence of the records.

**key-sequenced data set.** A data set whose records are loaded in key sequence and controlled by an index. Records are retrieved and stored by keyed access or by addressed access, and new records are inserted in the data set in key sequence by means of distributed free space. Relative byte addresses of records can change.

**keyed direct access.** The retrieval or storage of a data record by use of an index that relates the

record's key to its relative location in the data set, independent of the record's location relative to the previously retrieved or stored record. (See *also* addressed direct access, keyed sequential access, and addressed sequential access.)

**keyed sequential access.** The retrieval or storage of a data record in its key sequence relative to the previously retrieved or stored record, as defined by the sequence set of an index. (See *also* addressed sequential access, keyed direct access, and addressed direct access.)

**keyword.** A symptom that describes one aspect of a program failure.

**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.

**linear data set.** A named linear string of data, stored in such a way that it can be retrieved or updated in 4096-byte units. A linear data set object is essentially a VSAM entry-sequenced data set that is processed as a control interval. However, a control interval of a linear data set contains data only— it contains no record definition fields (RDFs) or control interval definition fields (CIDFs).

**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.

**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: more efficient than inserting each record directly.

**mass storage volume.** Two data cartridges in the IBM 3850 Mass Storage System that contain information equivalent to what could be stored on a direct access storage volume.

**master catalog.** A key-sequenced data set with an index containing 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 to accumulate usage statistics for data sets.

**memory.** As used in this book, a synonym for the private address space in virtual storage.

**module.** The unit of code that is link-edited. A program module has at least one procedure, and may have many.

## Glossary

**must-complete.** An indication to the operating system that the event must be performed without interruption or waiting.

**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.

**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.

**P pointer.** position pointer

**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 (for example, an alternate index and its base cluster).

**PDS directory.** The portion of a partitioned data set that provides a means of locating any of the members of the data set.

**period.** A group of tracks in which the first track does not begin with an overflow block, and the last track does not contain a block that overflows to another track.

**physical record.** On a track of a direct-access storage device, the space between interrecord gaps.

**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. (See *also* horizontal pointer and vertical pointer.)

**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.

**preformat channel program.** A channel program that writes a new format F record to an already existing data set.

**prime index.** The index component of a key-sequenced data set having one or more alternate indexes. (See *also* index and alternate index.)

**prime key.** The key of reference for a key-sequenced data set when it was loaded. (See *also* key.)

**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.

**qualified name.** A data set name consisting of a string of names separated by periods; for example, "TREE.FRUIT.APPLE" is a qualified 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."

**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.

**record.** (See index record, data record, stored record.)

**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 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 byte address.** (See RBA.)

**relative record data set.** A data set whose records are loaded into fixed-length slots.

**relative record number.** A number that identifies not only the slot in a relative record data set but also the record occupying the slot.

**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.

**replication.** (See index replication.)

**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.

**reusable data set.** A VSAM data set that can be reused as a work file, regardless of its old contents.

**ripple.** Moving data from one block of a chain to the next, due to modification of data in a preceding block.

**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 IOBUP LIM field of the IOB when the DCB specifies the extended search option.

**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 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 either its entry sequence or its key sequence, relative to the previously retrieved or stored record. (See *also* addressed sequential access and keyed sequential access.)

**shared resources.** 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. Resources are shared either locally (LSR) or globally (GSR).

**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.

**SIO appendage.** start I/O appendage

**skip sequential access.** Keyed sequential retrieval or storage of records 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.

**spanned record.** A 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).

**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.

**subroutine identification.** the 2 low-order bytes of each module's unique 8-byte name.

**system residence volume.** The volume on which the nucleus of the operating system is located.

**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.

## Glossary

**true name.** In a CVOL catalog, the high-level qualifier to which an alias is related.

**uncatalog.** To remove the catalog entry of a data set from a catalog.

**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. (This list is described in detail under "Data Areas.")

**unscheduled list.** An area of virtual storage containing the addresses of IOBs for requests for which a buffer is not available. Used only when virtual storage is specified for a task. (This list is described in detail under "Data Areas.")

**update channel program.** A channel program that reads or writes data for purposes other than adding a new block to an existing data set.

**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 catalog.** A catalog used in the same way as the master catalog, but optional and pointed to by the master catalog, and also used to lessen the con-

tion for the master catalog and to facilitate volume portability.

**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.

**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.

**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.

---

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# Technical Newsletter

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## **MVS/Extended Architecture Data Facility Product Version 2: Diagnosis Guide**

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This technical newsletter (TNL), a part of Version 2 Release 3.0 of MVS/Extended Architecture, Licensed Program 5665-XA2, contains pages of the subject publication. These replacement pages remain in effect for any subsequent releases unless specifically altered.

v, vi, 37, 38, 43, 44

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## Related Publications

Within the text, references are made to the publications listed in the table below:

Short Title (as it appears in the text)	Publication Title	Order Number
Access Method Services Reference (Integrated Catalog)	<i>MVS/Extended Architecture Integrated Catalog Administration: Access Method Services Reference</i>	GC26-4135
Access Method Services Reference (VSAM Catalog)	<i>MVS/Extended Architecture VSAM Catalog Administration: Access Method Services Reference</i>	GC26-4136
Data Administration: Macro Instruction Reference	<i>MVS/Extended Architecture Data Administration: Macro Instruction Reference</i>	GC26-4141
Debugging Handbook	<i>MVS/Extended Architecture Debugging Handbook, Volumes 1 through 6</i>	LC28-1164 <sup>1</sup> LC28-1165 LC28-1166 LC28-1167 LC28-1168 LC28-1169
DFDSS: Diagnosis Guide	<i>MVS/Extended Architecture Data Facility Data Set Services: Diagnosis Guide</i>	LY27-9538
DFDSS: User's Guide and Reference	<i>MVS/Extended Architecture Data Facility Data Set Services: User's Guide and Reference</i>	SC26-4125
DFHSM: Diagnosis Guide	<i>MVS/Extended Architecture Data Facility Hierarchical Storage Manager Diagnosis Guide</i>	SH35-0095
DFHSM: Messages	<i>MVS/Extended Architecture Data Facility Hierarchical Storage Manager Messages</i>	SH35-0094
DFP Diagnosis Reference	<i>MVS/Extended Architecture Data Facility Product Version 2: Diagnosis Reference</i>	LY27-9530
Diagnostic Techniques	<i>MVS/Extended Architecture Diagnostic Techniques</i>	SY28-1199
EREP User's Guide and Reference	<i>Environmental Recording, Editing, and Printing (EREP) User's Guide and Reference</i>	GC28-1378
ISPF Diagnosis	<i>Interactive System Productivity Facility Version 2 Diagnosis</i>	SC34-2140

<sup>1</sup> All six volumes may be ordered under one order number, LBOF-1015.

<b>Short Title (as it appears in the text)</b>	<b>Publication Title</b>	<b>Order Number</b>
Programming System General Information (PSGIM)	<i>IBM Field Engineering Pro- gramming System General Information</i>	G229-2228
Service Aids	<i>MVS/Extended Architecture System Programming Library: Service Aids</i>	GC28-1159
SMP System Pro- grammer's Guide	<i>OS/VS System Modification Program (SMP): System Pro- grammer's Guide</i>	GC28-0673
SMP/E Reference	<i>System Modification Program Extended (SMPIE) Reference</i>	SC28-1107
SMP/E User's Guide	<i>System Modification Program Extended (SMPIE) User's Guide</i>	SC28-1302
Supervisor Services and Macro Instructions	<i>MVS/Extended Architecture System Programming Library: Supervisor Services and Macro Instructions</i>	GC28-1154
System Codes	<i>MVS/Extended Architecture Message Library: System Codes</i>	GC28-1157
System Commands	<i>MVS/Extended Architecture Operations: System Commands</i>	GC28-1206
System Messages	<i>MVS/Extended Architecture Message Library: System Mes- sages, Volumes 1 and 2</i>	GC28-1376 GC28-1377
TSO Command Lan- guage Reference	<i>MVS/Extended Architecture TSO Command Language Ref- erence (OS/VS2 TSO Command Language Reference, as updated by Supplement SD23-0259 for MVS/XA)</i>	GC28-0646
Using Data Facility Hierarchical Storage Management with the Interactive Storage Management Facility	<i>MVS/Extended Architecture Using Data Facility Hierarchical Storage Management with the Interactive Storage Manage- ment Facility</i>	SH35-0108
Utilities	<i>MVS/Extended Architecture Data Administration: Utilities</i>	GC26-4150
Vocabulary for Data Processing, Telecom- munications, and Office Systems	<i>Vocabulary for Data Proc- essing, Telecommunications, and Office Systems</i>	GC20-1699
VSAM Administration Guide	<i>MVS/Extended Architecture VSAM Administration Guide</i>	GC26-4151

tural Errors” in the publication *VSAM Administration Guide*. The EXAMINE command provides details about the nature of data set damage.

**Example:** If a broken 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 64.

---

## 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 64 and go to the DADSM/CVAF-related "Incorrect Output Failure Modifier Keywords Procedure" on page 70 to identify appropriate 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 and 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?

---

## VSAM—Incorrect Output Keyword

### VSAM Block Processor/Record Management—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 is often caused by a previous failure. Examine the system and console logs for failure-related abends, messages, or return codes. A broken 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 record management provides return codes in register 15 and reason codes in both the access method control block (ACB) and 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 *VSAM Administration: Macro Instruction Reference* 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', append the value to the keyword prefix **RC** and specify the keyword as shown:

**RC000C0010**

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

Some incorrect output failures involve a broken VSAM data set. To determine whether you have a broken data set, use either IEHLIST or the IDCAMS EXAMINE command as described in Chapter 4, "Functional Command Format," in the publications *Access Method Services Reference (Integrated Catalog)* or *Access Method Services Reference (VSAM Catalog)* and in Chapter 12, "Checking a VSAM Key-Sequenced Data Set Cluster for Structural Errors" in the publication *VSAM Administration Guide*. The EXAMINE command provides details about the nature of data set damage.

If these service aids indicate that the data set is *not broken*, inform the IBM Support Center if you call for assistance. If they indicate that the data set is

*broken*, 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 broken 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):

---

2D08009C	9208009C	A608009C	A708009C
9108009C	D808009C	E008009C	D708009C
2A080020	2B080020	2C080020	DB080020
DF080020			

---

- 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 broken, rebuild it as directed at "VSAM—Record Management Broken Data Sets" on page 358 in the related publication *DFP Diagnosis Reference*, and rerun the job.
5. Turn to "Modifier Keywords" on page 64.

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