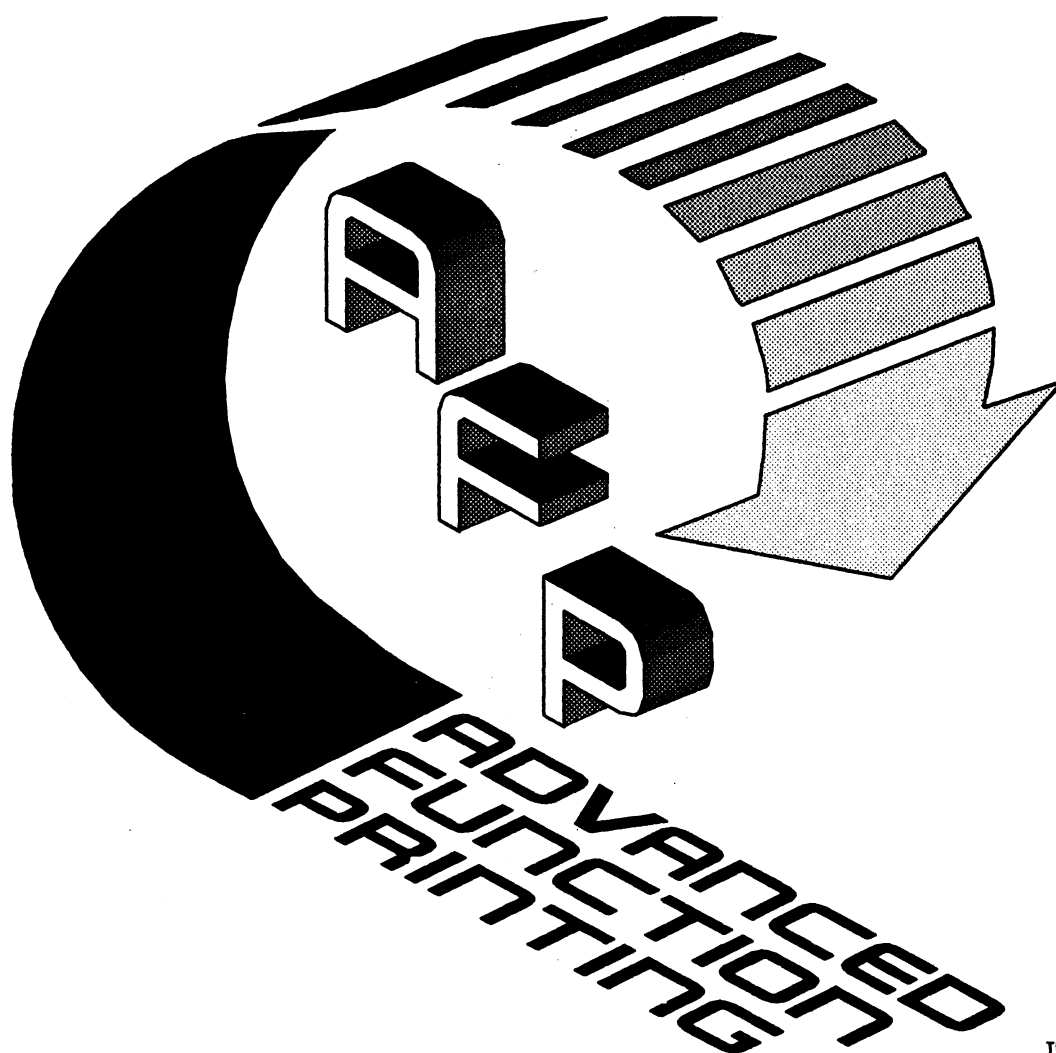




IBM Page Printer Formatting Aid/370: Diagnosis Guide and Reference

LH40-0207-00

Release 1.0



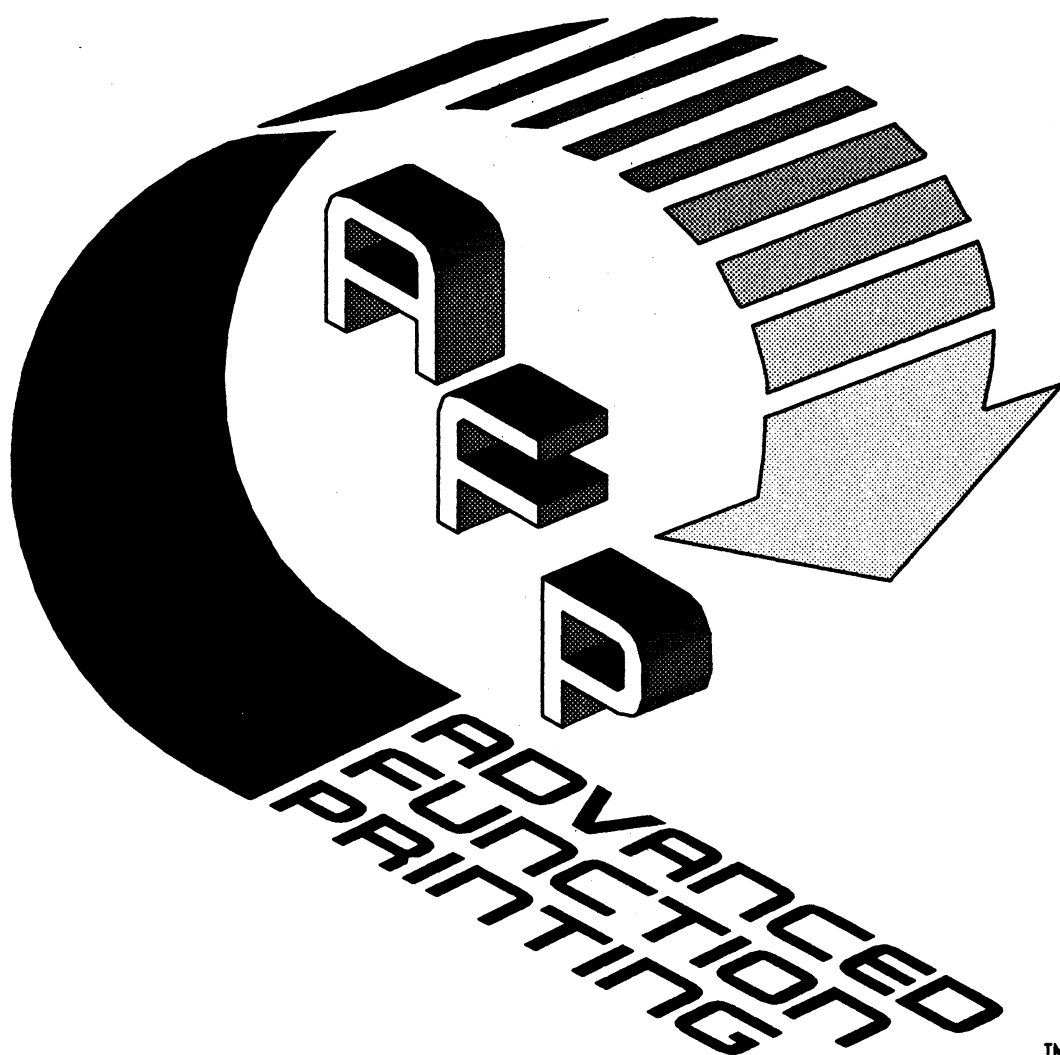
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LH40-0207-00

Release 1.0



First Edition (October 1990)

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Special Notices

This publication is intended to help diagnose problems concerning PPFA/370, and to communicate them to an IBM Support Center representative. It contains information to help you diagnose problems. This publication documents no programming interfaces for use by customers in writing programs that request or receive the services of PPFA/370.

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Chapter 1. How to Use This Publication

This publication is written for document administrators, advanced function printing (AFP) programmers, and system programmers. The purpose of the publication is to help you communicate with IBM support representatives about a failure in the Page Printer Formatting Aid/370 (PPFA/370) source. This publication describes the process to develop keywords to help identify a failure. It does not provide you with enough detail to change or to correct the program logic. A thorough review of the *Advanced Function Printing Diagnosis Guide* is strongly recommended as an aid in problem isolation.

Note: This publication contains no programming interfaces for customers.

Prerequisite Knowledge

To use this publication, you need a basic understanding of PPFA/370 at the level contained in the *Page Printer Formatting Aid/370 User's Guide and Reference* and the printer being used.

Before contacting the IBM Support Center, follow the processes described in "Part 1. Diagnosis Guide" to determine the program component and the type of failure and to verify that the current problem has not been previously reported and corrected.

Publication Organization

The *Page Printer Formatting Aid/370 Diagnosis Guide and Reference* is organized in two major parts: "Part 1. Diagnosis Guide" and "Part 2. Diagnosis Reference."

Part 1. Diagnosis Guide

This part contains information to help you diagnose failures in PPFA/370 and describe them to an IBM representative. The information in this part is useful only for diagnosing failures in the operation of PPFA/370 program. We assume, therefore, that you have already determined that PPFA/370 is the failing component and that a usage error did not cause the failure. "Part 1. Diagnosis Guide" is divided into the following chapters:

- Chapter 2, "Introduction" presents a brief overview of how IBM works with you in the diagnosis task.
- Chapter 3, "Using Keywords to Describe Problems" guides you in describing a PPFA/370 failure in terms of a string of keywords. Sample dumps are presented for VSE, MVS, and VM, showing the steps leading to identification of the name of the failing module for use in the development of keywords. How to use these strings in a search argument is then explained, followed by how to report program problems to IBM.

Part 2. Diagnosis Reference

This part contains additional information about PPFA/370. The information in this part is designed to help you diagnose program failures and to help you to provide diagnostic information to IBM. This manual is not intended to supply all the information necessary for module maintenance.

Part Two contains the following appendixes:

- Appendix A, "Service Aids" is a one-page listing of the diagnostic aids available in PPFA/370.
- Appendix B, "Control Block Directory" is a list of all control blocks contained in PPFA/370.
- Appendix C, "Module and Message Reference" is a table of modules and messages, keyed first to an alphabetical list of modules and second to a numerical list of message IDs.
- Appendix D, "Register Conventions" lists the information contained in each register controlled by PPFA/370 during execution.

A glossary of terms used in this publication and an index to the book follow the appendixes.

Related Publications

Following is a list of related publications:

PPFA/370

Title	Order Number
<i>IBM Page Printer Formatting Aid/370: User's Guide and Reference</i>	S544-3700
<i>IBM Page Printer Formatting Aid/370: Command Quick Reference</i>	G544-3701

Advanced Function Printing

Title	Order Number
<i>Advanced Function Printing: Diagnosis Guide</i>	LH40-0201
<i>Advanced Function Printing: Data Stream Reference</i>	S544-3202
<i>Advanced Function Printing: Printer Information</i>	G544-3290

Print Services Facility

Title	Order Number
<i>Print Services Facility/MVS: System Programming Guide</i>	S544-3672
<i>Print Services Facility/VM: System Programming Guide</i>	S544-3680
<i>Print Services Facility/MVS: System Programming Guide</i>	S544-3665

MVS/XA

Title	Order Number
<i>MVS/XA JCL User's Guide: System Programming</i>	GC28-1351
<i>MVS/XA JCL Reference: System Programming</i>	GC28-1352

MVS/ESA

Title	Order Number
<i>MVS/ESA JCL User's Guide: System Programming</i>	GC28-1830
<i>MVS/ESA JCL Reference: System Programming</i>	GC28-1829

VM

Title	Order Number
<i>VM/SP Command and Macro Reference</i>	SC19-6209
<i>VM/SP CMS User's Guide</i>	SC19-6210

VSE/POWER

Title	Order Number
<i>VSE/POWER: Installation and Operation</i>	SH12-6371

Part 1. Diagnosis Guide

This part contains information to help you diagnose failures in PPFA/370 and describe them to an IBM representative. The information in this part is useful only for diagnosing failures in the operation of PPFA/370 program. We assume, therefore, that you have already determined that PPFA/370 is the failing component and that a usage error did not cause the failure.

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Chapter 2. Introduction

This diagnosis guide helps you to describe failures in the operation of the Page Printer Formatting Aid/370 (PPFA/370) through the use of keywords. A *keyword* is a word that describes one characteristic of a program failure. You are guided in the development of a keyword string that describes a program failure by following the instructions in Chapter 3, "Using Keywords to Describe Problems" on page 9. This publication also aids you in communicating with product-support personnel.

After you have developed a keyword string, you can use these keywords to help you discover whether a correction exists for the failure. You can do this either by using the keywords to search an IBM software-support database, or by providing the keywords when you contact your IBM Support Center.

The term *software-support database* is used in this publication to represent the Information/System (I/S) or the Early Warning System (EWS). The I/S is an online data base that contains up-to-date resolutions of authorized program analysis reports (APARs). The EWS is a microfiche copy of the information contained in the I/S. If you do not have access to the software-support database, you should contact your IBM Support Center and give them the keywords, plus any other relevant information (see "Calling the IBM Support Center" on page 38).

If the failure is known, there is usually a correction for it. If not, the keywords can help IBM correct the problem.

People Involved

Persons normally involved in the diagnosis and correction process are listed below with a brief description of their tasks.

Diagnostician

Diagnosticians are the principal users of this publication. Their task is to identify the cause of a failure and, if the cause is PPFA/370, to describe the failure using a keyword string.

If the diagnosticians have access to the software support data, then they can use the string to search the data base. This search helps determine if the same failure has been described previously and, if so, whether a correction exists. The diagnosticians can contact an IBM Support Center for help in doing the search.

IBM Support Center Representative

The Support Center representative has three functions in the diagnosis and correction process:

- To help in the diagnostic search
- To provide a correction if one exists
- To refer the problem to an IBM specialist if a correction is not found.

IBM Specialist

The IBM specialist contacts the diagnosticians. Together they:

- Verify that the diagnosticians used correct keywords in building the string
- Gather additional required information (described in "APAR Preparation" on page 39) about the failure.
- If the problem has not been reported previously, the IBM specialist
 - Tries to develop a bypass so productive work can continue.
 - Refers the problem to the IBM Change Team by preparing an authorized program analysis report (APAR)
 - Gives the customer the APAR number to use when sending requested documentation to the IBM Change Team.

IBM Change Team

The tasks of the IBM change team are:

- To develop corrections for program problems reported on APARs
- To make the correction available to the customer reporting the problem
- To modify the keyword string to describe the failure more accurately, if necessary
- To add the keyword string and the program fix to the software-support database.

Chapter 3. Using Keywords to Describe Problems

Specifying a Program Failure

Each keyword describes one characteristic of a program failure. The first keyword in a keyword string identifies PPFA/370 by its component identification number. To some extent, each keyword after the first is optional. If circumstances make it particularly difficult to follow the instructions given for choosing some keyword, you can omit the keyword. In general, however, if you contact IBM, you will be asked to identify your problem with a full keyword string as described in the following pages. A complete keyword string for PPFA/370 identifies the following:

- Component identification number
- Type of failure
- Failing module, modifier, or both
- Maintenance level.

A search of an indexed database with only the component identification number keyword detects all reported problems for the entire licensed program. Adding other keywords to the search argument reduces the number of matches and increases the chances of locating a match for your particular problem.

Your search is most successful if you follow these rules:

- Use only the keywords in this publication
- Spell the keywords exactly as they are give here
- Follow the keyword procedure in the order shown.

Getting Started

Before you develop a keyword string, do the following:

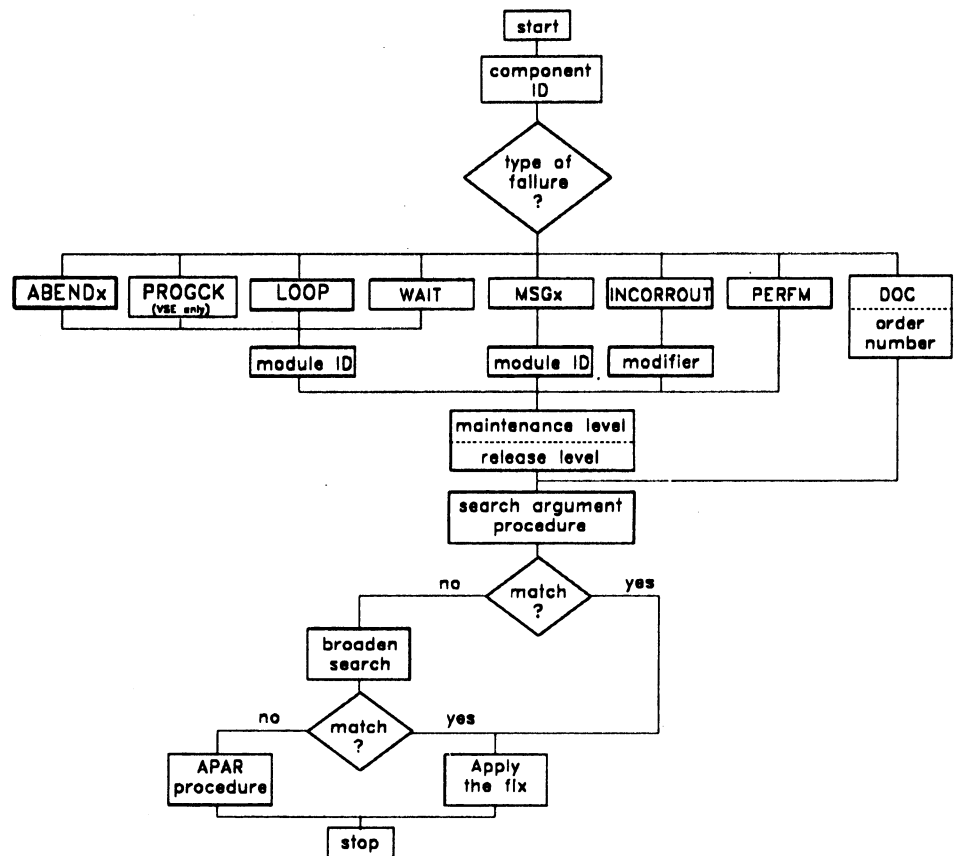
1. If PPFA/370 has been changed by a program temporary fix (PTF) since you last used it, note the PTFs and the modules that were changed. If the error occurs as the result of changes in the program and cannot be corrected, note the change that caused the error.
2. Correct all problems diagnosed by messages.
3. Note the sequence of events that led to the error condition. This information can be useful in developing a keyword string and is needed to submit an APAR.
4. Examine your specifications (such as JCL/JCS or command stream) to verify that they have been specified correctly. If an error is found, correct it and continue the task.

Developing a Keyword String

To develop a keyword string, follow the steps in each of the procedures (described later) for identifying characteristics of a program failure, unless a branch to another procedure is specified.

Note: The procedures described here for developing a keyword string are intended to ensure that any two people will develop an identical set of keywords when working on the same type of problem caused by the same program error.

The following diagram shows a sample diagnosis procedure for building a keyword string.



The keyword string is *highlighted* throughout the procedures. Each step provides a partial keyword string that describes what is known at that time about the program problem. A partial keyword string may require inserting a specific piece of information. (For example, you might need to add the identifier of the message received to the MSGx keyword). The information to be added will be known at that time. You should continue to develop the keyword string until you are instructed to use it as a search argument.

If you have access to the software-support database, search the database as soon as the keyword string is complete enough to make a search reasonably productive. If an early search is unsuccessful, instructions for continuing the problem diagnosis are given. Go to "Component Identification Keyword" on page 11 to begin developing a keyword string.

Component Identification Keyword

The component identification number is the first keyword in a keyword string and is used whenever PPFA/370 is suspected of being the failing component. The component identification keyword should be used with at least one other keyword to search the software-support database. Used alone, it will produce a full listing of APARs against PPFA/370.

Procedure:

1. The component identification number is:
568819001
2. Go to "Type-of-Failure Keyword" on page 12 to determine the type of failure that occurred.

Type-of-Failure Keyword

The following keywords identify the types of failures that can occur in PPFA/370.

From the list, select one keyword that best describes the program failure, and follow the procedure for that particular failure type.

Keyword	Type of Failure
ABENDxxxx	Abnormal end of PPFA/370. See "ABENDxxxx" on page 13. Note: The procedure is different for VSE, MVS, and VM.
DOC	Information is missing or incorrect in one of the PPFA/370 publications. See "DOC" on page 16.
INCORROUT	Incorrect or missing output, without a message. See "INCORROUT" on page 17.
LOOP	The program is doing something repetitively. See "LOOP" on page 18.
MSGx	A PPFA/370 error message has been received. See "MSGx" on page 19.
PERFM	Performance is degraded. Use only when no other keyword is appropriate. See "PERFM" on page 20.
PROGCK	Program check in PPFA/370. See "PROGCK" on page 21. Note: Applies only to VSE.
WAIT	The program does not seem to be doing anything. See "WAIT" on page 22.

ABENDxxxx

Use *ABENDxxxx* when the host system or the program that produces PPFA/370 output ends abnormally.

Do not use this keyword if the abnormal end was forced by the host system because of a prolonged wait state or an endless loop. For those situations, refer to the WAIT and LOOP keywords.

MVS Procedures

ABEND is an abnormal termination because of ESTAE abnormal task-termination routine. Two types of ABENDs can occur:

Type	Message ID
System initiated	AKQ540T
User-initiated	AKQ541T

**System Initiated
ABEND**

AKQ540T messages contain a three-character hexadecimal code. These codes are described in *OS/VS Message Library: VS2 System Codes*, GC38-1008.

1. Add the hexadecimal code to the keyword (replacing the xxxx).

For example, use ABEND0C6 if an 0C6abend occurred:

Component ID No.	Type
568819001	ABEND0C6

2. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

**User Initiated
ABEND**

AKQ541T messages contain a four-character hexadecimal code:

Code	Meaning
0257	FREEMAIN FAILED IN AKQFMN
0265	MESSAGE GENERATION FAILED IN AKQGNMS
0269	MESSAGE GENERATION FAILED IN AKQTERM

A fourth code:

0300	ESTAE ESTABLISHMENT FAILED IN AKQERR
------	--------------------------------------

does not print with the AKQ541T message and appears only in a storage dump.

1. Add the hexadecimal code to the keyword (replacing the xxxx).

For example, use ABEND0257 if an 0257abend occurred:

Component ID No.	Type
568819001	ABEND0257

2. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

VM Procedures

ABEND is an abnormal termination.

Type	Message ID
System initiated	AKQ640T
User initiated	AKQ641T

System Initiated
ABEND

AKQ640T messages contain a three-hexadecimal code. These codes are described in *VM/SP Message and Codes*, SC19-6204.

1. Add the three-hexadecimal code to the keyword (replacing the xxxx).

For example, use ABEND0C6 if an 0C6 abend occurred:

Component ID No.	Type
568819001	ABEND0C6

2. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

User Initiated
ABEND

AKQ641T messages contain a four-hexadecimal code:

Code	Meaning
0257	FREEMAIN FAILED IN AKQFMN
0265	MESSAGE GENERATION FAILED IN AKQGNMS
0269	MESSAGE GENERATION FAILED IN AKQTERM

A fourth code

0300 ESTAE ESTABLISHMENT FAILED IN AKQERR

does not print with the AKQ541T message and appears only in a storage dump.

1. Add the four-hexadecimal code to the keyword (replacing the xxxx).

For example, use ABEND0257 if an 0257 abend occurred:

Component ID No.	Type
568819001	ABEND0257

2. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

VSE Procedures

ABEND is an abnormal termination because of STXIT abnormal task-termination routine. In most ABEND cases, PPFA/370 displays the AKQ420T message in the message listing. This message contains an abnormal termination code (two hexadecimal digits). These codes are described in *VSE/Advanced Functions Version 2.1 Messages and Codes*, SC33-6181.

1. If the explanation of the code indicates a PPFA/370 logic error, use the ABEND keyword with the appended ABEND code.
2. Add the two-character hexadecimal code to the keyword (replacing the xxxx).

For example, use ABENDnn if an nn abend occurred:

Component ID No.	Type
------------------	------

568819001	ABENDnn
-----------	---------

where nn equals the two hexadecimal character abnormal termination code.

3. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

DOC

Use *DOC* when a programming problem appears to be caused by incorrect or missing information in one of the PPFA/370 manuals.

Procedure

1. If the problem is in a PPFA/370 publication, place the order number one space after the DOC keyword and omit the hyphens. For example, if the order number is S544-3700-00, specify DOC S544370000
2. Prepare a description of the problem. You should also include this information in the error description when submitting an APAR. The format of the keyword string is:

Component ID No.	Type-of-Failure Keyword
568819001	DOC S544370000

3. If you do not have access to a software- support database, contact your IBM representative. If you do have access, go to the next step.
4. To determine if documentation deficiency has been reported as a problem, go to "Search Argument Procedure" on page 37. If the search is unsuccessful, return to this procedure list to continue.
5. If this is a documentation deficiency that may cause lost time for other users, please contact your IBM Support Center. Tell them where the error exists and describe the problem it caused. Go to "Calling the IBM Support Center" on page 38.
6. If the documentation deficiency is less severe, use the reader's comment form contained in the back of that publication to recommend improvements to the publication.

INCORROUT

Use *INCORROUT* when the expected output was not received or when the output was different from what was expected.

Note: Do not use this keyword for output that appears to be repeated endlessly; use the LOOP keyword instead.

Procedure

Be sure that the output is really incorrect and not merely at variance with the intended result.

1. The format of the partial keyword string is:

Component ID No.	Type-of-Failure Keyword
568819001	INCORROUT

2. See "INCORROUT Modifier Keywords" on page 24 to select the appropriate modifier.

LOOP

When to Use LOOP

Use *LOOP* if some part of the program executes endlessly or if some part of the output repeats endlessly.

When Not to Use LOOP

- If a message repeats endlessly. Use the MSGx keyword.
- If there is an intentional loop used to wait for some resource. Use the WAIT keyword.

Note: You may use the LOOP keyword with or in addition to the MSGx or WAIT keyword. Your search for a matching problem might be more successful.

Procedure

1. A loop or a wait may be the problem if there is no evidence of activity by PPFA/370 when such activity is expected.

A wait can be determined from a partition dump.

A loop can be determined by a trace.

For **VSE**, use SDAID to trace activity for the entire partition (see "SDAID" in *VSE/Advanced Functions Diagnosis: Service Aids*, SC33-6099).

For **MVS**, use GTF to trace activity for the entire address space (see "GTF" in *OS/VS2 MVS System Programming Library: Service Aids*, GC28-0674).

For **VM**, use command CP TRACE to trace activity for the user virtual machine (see *CP Command Reference*, SC19-6211 and *CMS User's Guide*, SC19-6210).

If, after taking a trace, you cannot find the cause of looping, have the operator obtain a dump of the PPFA/370 partition before canceling it.

2. Having determined that PPFA/370 is looping, or if you suspect that it may be looping and would like to search for a known looping problem, use the keyword LOOP.
3. The format of the partial keyword string is:

Component ID No.	Type-of-Failure Keyword
568819001	LOOP

4. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

MSGx

Use *MSGx* when:

- A message is issued that indicates an internal program error
- A message is issued in some set of conditions that should not cause it to be issued
- A message is not issued in some set of conditions that should cause it to be issued
- A message contains invalid or missing data
- A message containing "Contact IBM" as the user response was issued
- The corrective action suggested in the appendix, "Codes and Messages" of *Page Printer Formatting Aid/370: User's Guide and Reference* does not correct the problem.

Each PPFA/370 message is identified by a set of seven characters, in the form

AKQnnns

where

AKQ identifies the component
 nnn identifies the message serial number
 s indicates the message type.

Procedure

1. Replace the x in the *MSGx* keyword with the seven-character message identifier. For example, if the message identifier is AKQ102E, the MSG keyword is:

MSGAKQ102E

2. Use Appendix C, "Module and Message Reference" on page 47 to identify the module or modules issuing the message.

For example, message AKQ102E indicates an invalid command is present in a command stream. This message is issued by AKQGTCM. The partial keyword string is:

Component ID No.	Type-of-Failure Keyword	Module
568819001	MSGAKQ102E	AKQGTCM

If more than one module can issue the message, repeat the string for all modules.

Component ID No.	Type-of-Failure Keyword	Module
568819001	MSGAKQ108E	AKQSBCM
568819001	MSGAKQ108E	AKQCFC
568819001	MSGAKQ108E	AKQSBFD
568819001	MSGAKQ108E	AKQSBPD

Note: The module that issued the message is not necessarily the failing module.

3. Go to "Maintenance and Release Level Keywords" on page 23 to select the appropriate keywords.

PERFM

If you suspect PPFA/370 is causing a performance problem, build a *PERFM* keyword string to describe the problem and see whether the problem has been reported and solved previously. Ensure that application programs, job control statements or language, and PPFA/370 command streams have been thoroughly examined.

Note: Be aware that the speed with which a job is processed can vary depending on the number and complexity of the resources used. There is a difference between a performance problem, as indicated by the PERFM type-of-failure keyword, and performance tuning.

Procedure

1. The format of the partial keyword string is:

Component ID No.	Type-of-Failure Keyword
568819001	<i>PERFM</i>

2. See "Maintenance and Release Level Keywords" on page 23 to select the appropriate keywords.

PROGCK

*This keyword applies only to **VSE** users.*

Use this keyword when a PPFA/370 task ends because of a program check.

Procedure

If a dump is provided by the system without an AKQ420T message, use the PROGCK keyword.

1. The format of the partial keyword string is:

Component ID No.	Type-of-Failure Keyword
568819001	PROGCK

2. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

WAIT

The host system, PPFA/370, or some program that services PPFA/370 has suspended activity, without issuing a message, while waiting for some condition to be satisfied.

Use *WAIT* when:

- The program status word (PSW) for the host system has the wait bit on
- No activity has occurred over a period of time
- No repeated visual output appears.

If a *WAIT* condition is suspected, for

VSE use the VSE/AF DUMP command to obtain a dump of the partition.
MVS use the OS CANCEL command.
VM terminate the session and request a storage dump.

Do not use *WAIT* if the wait occurs after an abend or because of an endless loop in PPFA/370. In such instances, use the *ABEND* or *LOOP* keywords.

Note: You might find a matching problem easier if you build two keyword strings; one with the keyword *WAIT* and one with the keyword *LOOP*.

Procedure

1. Add the *WAIT* keyword to the string. The format of the partial keyword string is:

Component ID No.	Type-of-Failure Keyword
568819001	PROGCK

2. Go to "Module Keyword" on page 26 to select a module name for use in developing the keyword string.

Maintenance and Release Level Keywords

This keyword identifies the maintenance level of PPFA/370. Each program temporary fix (PTF) applied to PPFA/370 has a 7-character ID (two letters and five numerals). For example, if the last PTF applied was PTF 22577, the keyword is UL22577. To determine the PTF ID, see the *Program Directory* shipped with the PPFA/370 licensed program.

Use PTF numbers as a keyword only if you feel that the PTF has caused the problem. The match you are looking for might have been found for a program with a PTF level earlier or later than yours.

The cover of the *Program Directory* you received shows the release and modification levels of your PPFA/370 program. You must specify these three numbers as part of your keyword string.

Procedure

1. Specify the PPFA/370 version, release, and modification levels as a three-character code. For example,

100	represents Version 1 Release 0 Modification 0
111	represents Version 1 Release 1 Modification 1
200	represents Version 2 Release 0 Modification 0
2. Specify the ID of the latest PTF applied to your PPFA/370 program. Use the the 7-character PTF number as a keyword *only* if you feel that the PTF has caused the problem.
3. The format of the keyword string is:

Component ID No.	Type-of-Failure Keyword	Module Modifier	Release and Modifica- tion Levels
568819001	WAIT	AKQPPFA	110 UL22577

4. You now have the information needed for an effective search of the problems listed in the software-support database.
5. Do you have access to the software-support database?

Yes	Go to "Search Argument Procedure" on page 37 and perform the necessary actions.
No	Go to "Calling the IBM Support Center" on page 38.

INCORROUT Modifier Keywords

These modifier keywords can be used to describe missing data, extra data, or data to better identify a particular problem area. There are three parts to modifier keywords.

- The first describes the user data type (for example, a line-data document).
- The second describes what aspect of the output was incorrect (for example, a font, the print direction, or the number of lines per inch).
- The third describes how the aspect was incorrect (for example, wrong font, wrong print direction, or too many lines per inch).

Procedure

1. Choose one keyword from the following table to describe the type of data that had incorrect output.

Keyword	Explanation
LINE	The document consisted of line-printer data (optionally including control records).
COMPOSED	The document consisted of composed-text data (for example, the output from DCF).
MIXED	The document consisted of both line-printer and composed-text data.

2. Choose one or more PPFA/370 commands or subcommands to describe what was wrong. For example, if the page was printed in the wrong direction, you should specify PAGEDEF.
3. Choose one or more keywords from the following table to describe the error just named.

Keyword	Explanation
CONTENT	Error in content formatted by malfunctioning command.
DIRECTION	Error in printline, field, or logical page direction.
EXTRA	An extra part was included in the output.
LENGTH	Error in field length parameter.
LINESPACE	Error in line spacing for document, page, or text string.
MISSING	Part named in malfunctioning command was missing from output.
POSITION	Error in position of part affected by malfunctioning command.
REPEAT	Error in repetition of text or image cells.
ROTATION	Error in rotation of font.
SIZE	Error in size of logical page or overlay.

Examples of the format for the partial keyword string follow:

Component ID No.	Type-of-Failure Keyword	Modifiers
568819001	INCORROUT	LINE PAGEDEF DIRECTION
568819001	INCORROUT	COMPOSED OFFSET POSITION
568819001	INCORROUT	LINE REPEAT TOO FEW
568819001	INCORROUT	LINE OVERLAY MISSING

The more precisely the incorrect output is defined, the more selective is the resulting search.

4. Go to "Maintenance and Release Level Keywords" on page 23 to select the appropriate keyword.

Module Keyword

This keyword identifies the module related to the program failure.

Procedure

1. Get a storage dump of the virtual storage area where the PPFA/370 code was loaded.

Detailed dump diagnosis information and a sample dump are contained in "Using ABEND Dumps to Identify Failing Module" on page 27.

2. Find the instruction address where:
 - the abend or dump occurred
 - the SVC for the WAIT was issued
 - the loop occurred.
3. Go back from that instruction until you find a six- to eight-character module name (for example, AKQSCAN), followed by a module date and an IBM copy-right statement. Include the module name as part of the keyword string.
4. Add the module name to the keyword string.

Note: This is not necessarily the failing module.

5. The format of the partial keyword string might look like:

Component ID No.	Type-of-Failure Keyword	Modifiers
568819001	LOOP	AKQSCAN

6. Go to "Maintenance and Release Level Keywords" on page 23 and select the appropriate keywords.

Using ABEND Dumps to Identify Failing Module

Types of PPFA/370 ABEND Dumps

Although ABEND dumps are handled differently by VSE, MVS, and VM, for each operation system there are two conditions that can cause PPFA/370 execution to come to an abnormal end.

For **VSE**, the conditions causing an abnormal end are:

- A system error

Note: These storage dumps are not automatic but can be requested by specifying the DUMP or PARTDUMP parameters in the OPTION statement.

A dump resulting from a system error is documented in SYSLSST for PPFA/370 message AKQ420T. Normally, the message text is sufficient to guide you in successfully reconfiguring the job.

- A defect in PPFA's code.

A defect in PPFA/370 causes an automatic storage dump, *not* accompanied by a message. To examine this type of dump to discover the name of the failing module in PPFA/370, see "Sample ABEND Dump Search for VSE" on page 28.

For **MVS**, the conditions causing an abnormal end are:

- A system-initiated ABEND
- A user-initiated ABEND.

In either of these ABENDs, control is passed to the ESTAE exit routine. PPFA/370 issues one of two messages:

AKQ540T if the ABEND was system initiated
AKQ541T if the ABEND was user initiated.

Both are printed in SYSPRINT output. If you want to print the dump, you should include either a SYSABEND or a SYSUDUMP DD statement in the job stream.

For **VM**, the conditions causing an abnormal end are:

- A system-initiated ABEND
- A user-initiated ABEND

In either of these ABENDs, control is passed to the user who can order a dump by using the DEBUG command and its subcommand DUMP. For details of using DEBUG, see *VM/SP Command and Macro Reference*, SC19-6209, and *VM/SP CMS User's Guide*, SC19-6210. PPFA/370 issues one of two messages:

AKQ640T if the ABEND was system initiated
AKQ641T if the ABEND was user initiated.

The following sections explain how to examine dumps taken in VSE, MVS, or VM to discover the name of the failing module in PPFA/370. The steps used to analyze the dump allow you to locate the name of the last module entered but not exited.

Sample ABEND Dump Search for VSE

You will search through several addresses in the dump, each one pointing to the next address, until you find the failing instruction. The right side of the page contains the contents of the source code.

The following steps and diagram describe the search sequence:

1. Find the Main Control Block (MCB) in the dump. Register 8 contains the address of the MCB. Example on page 29.

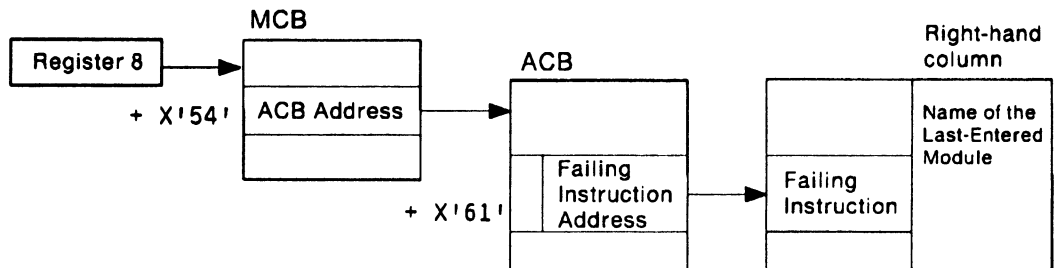
Note: In searching through your ABEND dump to find Register 8, locate registers active at ABEND.

2. Find the ABEND Control Block (ACB) in the dump. Within the MCB, at offset X'54', is the ACB address. Example on page 30.
3. Find the address of the failing instruction. Offset X'61' within the ACB is the three-byte address of the failing instruction. Example on page 31.
4. From the failing instruction address, scan the right column upwards for the up-to-eight-character name of the failing module. Example on page 32.
5. Add this name to your keyword string.

The format of your partial keyword string is:

Component ID No.	Type-of-Failure Keyword	Module
568819001	PROGCK	AKQSCAN

6. Go to "Maintenance and Release Level Keywords" on page 23 and select the appropriate keywords.



The following diagram shows part of a sample **VSE** storage dump. Register 8 is marked. It shows the address X'0C019C'.

SYMPTOM RECORD																			
E0E220					00000001	E2D9F3F0	F8F1F0F2	F4F1F1F2	F1F17AF1	*					SR308102411211	1*			
E0E240	F47AF1F7	7AF0F0F9	F061F0F8	61F2F1F1	F77AF1F4	7AF1F77A	F0F0F5F6	F6F660F3		*4	17	0090/08/2117	14	17	005666-3*				
E0E260	F0F140C8	F0F74000	E2C307D9	C5D84040	00000000	00000000	001F0074	00000093		*01	H07	SCPREQ							
E0E280	00000093	00000093	00000000	00000000	00000000	00000000	00000000	00000000		*									
E0E2A0	00000000	C1C261E2	F1F8F0F0	40D9C5C7	E261F0C3	F0F4F640	D9C5C7E2	61F0C6F0		*		AB/51800	REGS/0C046	REGS/0F0*					
E0E2C0	F4F84000									*48									
PSW AND REGISTERS OF ENDING TASK																			
PSW=		07100000 00088782																	
R8	GR 0-F	00000030	00088858	000D3708	000C0460	000C0488	000C0DD0	00000088	000C0F6C										
		000C019C	00000000	000D3800	000C2998	6008873C	000C2998	00000000	0008873A										
FP 0-3		40404040	40404040	40404040	40404040	40404040	40404040	40404040	40404040										
COMREG 86 ADDRESS IS 000538 LENGTH IS 0000E4																			
000520							F0F861F2	F161F9F0		*					08/21/90*				
000540	00000000	00000000	00000000	00000000	C1D2D8C9	E507F1E7	0008FFFF	000A2C40		*					AKQIVP1X				
000560	000A2C40	00000010	00FFFFFF	FF5F44D3	200044D0	19000000	2CA8A296	14D84058		*					L		Q \$*		
000580	118C1199	11A638F0	F8F2F1F9	F0F2F3F3	0000108C	0000FE98	408C0000	00000000		*		082190233							
0005A0	00000010	F1400000	000080F8	00F57A00	00000820	0FEC4790	00000000	053811E1		*	1	5							
0005C0	00FC8000	68680F40	40404040	40404000	40404040	40404000	008D6000	C4000000		*					- 0				
0005E0	00F54000	02044040	00000000	00000000	00F578D0	01023F00	0C070005	00000000		* 5		5							
000600	001FD000	00000000	C2C7D7D6	D6D30000	C1D2D8D7	D7C6C140	00000000			*		BGP00L	AKQPPFA						

Search for this address. In the sample, this address is the top of the MCB (see page 30 for the example).

The following diagram shows the location of address X'0C019C', the top of the MCB. The offset of the ACB address within the MCB is X'54'.

```

0A3000      PAGE(S) NOT USED

0C0000  00000000 --SAME--
0C0080  00000000 00000000 000C0100 60DDE398  60097E62 00080078 000C00C8 0008FFFF
0C00A0  00000029 000C00CC 00F71F80 000C00C8  000800E0 40DDE392 00000610 00000000
0C00C0  0008FFFF  60097E7A 800C00CC 0023C6D6  D9D4D3C9 C27EE3C5 E2E348D7 D76C168
0C00E0  D7C1C7C5 D3C9C27E E3C5E2E3 4B07D7C6 C1000000 00000000 00000000 00000000
0C0100  00000000 000C0080 00000000 00000000  00000000 00000000 00000000 00000000
0C0120  00000000 --SAME--
0C0180  00000000 00000000 00000000 00098154  000C0198 00000000 000C1180 04C3C240
0C01A0  00000088 000C1180 00012800 000C0100  00010000 000C00C8 800C00CE 00000023
0C01C0  C1D2D8CB E5D7F1E7 F0F1F0F0 F0F8F2F1  F9FAE1E1 F1F4F1F7 00000000 000C0224
0C01E0  000C3180 000C0438 000C03A8 000C0488  000C0DD0 000C0EF4 000C0460 000C0F6C
0C0200  00000000 00000000 000C2998 00000001  00000000 00000000 00000000 00000000
0C0220  00000000 000C3C240 00000184 00000000  00000000 00000000 00000000 00000000
0C0240  00000000 --SAME--
0C0260  00000000 00000000 000D3680 00000000  00000000 00000000 00000000 00000000

                                X'54'

                                *          - T -          H          *
                                *              7            T           *
                                *          -        FORMLIB TEST.PPFA,*
                                *PAGELIB TEST.PPFA                      *
                                *                                          *
                                *                                          *
                                *                                          MCB *
                                *                                          *
                                *                  H                *
                                *AKQIVP1X0100082190111417             *
                                *                  4          -         *
                                *          FCB                          *
                                *                                          *
                                *                                          *
                                *                                          *
                                *                                          *

                                X'2BE2E' , Top of MCB

```

```

X'0C019C'
+   X'54'
-----
X'0C01F0'

```

Thus, the top of the ACB is at address X'0C01F0'. As shown in diagram, this address in turn contains the address X'0C0DD0'.

Example address X'0C0DD0' is shown on page 31.

The address of the failing instruction is offset X'61' from the top of the ACB.

0A3000 PAGE(5) NOT USED

```

0C0000 00000000 --SAME--
0C0080 00000000 00000000 000C0100 600DE398 60097E62 00080078 000C00C8 0008FFFF
0C00A0 00000029 000C00CC 00F71F80 000C00C8 000800E0 400DE392 00000610 00000000
0C00C0 0008FFFF 60097E7A 800C00CC 0023C606 090403C9 C27EE3C5 E2E348D7 07C6C168
0C00E0 07C1C7C5 03C9C27E E3C5E2E3 48D707C6 C1000000 00000000 00000000 00000000
0C0100 00000000 000C0080 00000000 00000000 00000000 00000000 00000000
0C0120 00000000 --SAME--
0C0180 00000000 00000000 00000000 00098154 000C0198 00000000 000C1180 04C3C240
0C01A0 00000088 000C1180 00002000 000C0100 00010000 000C00C8 800C00CE 00000023
0C01C0 C10208C9 E507F1E7 F0F1F0F0 F0F8F2F1 F9F0F1F1 F1F4F1F7 00000000 000C0224
0C01E0 000C3180 000C0438 000C03A8 000C0488 000C00D0 000C0EF4 000C0460 000C0F6C
0C0200 00000000 00000000 000C2998 00000001 00000003 00000000 00000000 00000000
0C0220 00000000 C6C3C240 00000184 00000000 00000000 00000000 00000000
0C0240 00000000 --SAME--
0C0260 00000000 00000000 00003680 00000000 00000000 00000000 00000000
0C0280 00000000 00000000 00000000 000D3800 00000000 00000000 00000000
0C02A0 00000000 000D3200 00000000 00000000 00000000 00000000 00000000
0C02C0 00000000 00000000 000D3600 0000007A 00000000 00000000 00000000
0C02E0 00000000 --SAME--
0C0300 00000000 00000000 00000000 00000000 00000000 00000000 000D3880
0C0320 C6C4C5C6 C4C44040 E3C5E2E3 40404040 D7D7C6C1 40404040 40404040 40404040
0C0340 00000000 00000000 00000000 00000000 00000000 00005980 D7C4C5C6
0C0360 C4C44040 E3C5E2E3 40404040 D7D7C6C1 40404040 40404040 40404040 00000000
0C0380 00000000 --SAME--
0C03A0 00000000 00000000 C9C4C140 00000090 00000000 00000000 40404040 40404040
0C03C0 40404040 --SAME--
0C0400 40404040 40404040 40404040 40404040 40404040 40404040 00000000
0C0420 00000000 00000000 00000000 00000000 00000000 07D9E340 00000028
0C0440 00000001 00000000 0000003C 00000000 00000000 00000000 00000000
0C0460 E2C1D440 00000028 0000E566 000C4880 000C4880 00000000 00000000 00000000
0C0480 00000000 00000000 E3E2E340 00000948 00000008 00000000 00000000 00000000
0C04A0 00000000 --SAME--
0C0DC0 00000000 00000000 00000000 00000000 C1C3C240 00000124 00000000 00000000
0C0DE0 00000000 --SAME--
0C0E20 00000000 00000000 000C019C 071D0001 40083224 000D3800 000D3708 000D3708
0C0E40 000C0460 000C0488 000C00D0 00000088 000C0F6C 000C019C 000D3680 000C2A28
0C0E60 00092278 4009127C 000C2A28 400920DE A0000000 000C019C 00000000 00000000
0C0E80 00000000 --SAME--
0C0EE0 00000000 00000000 00000000 00000000 00000000 D4E3D340 00000078 00000000
0C0F00 00000000 --SAME--

```

'X 61'

X'0C0DD0', Top of ACB

```

X'0C0DD0'
+ X'61'
-----
X'0C0E31'

```

Note: These are bytes 5 through 7 of the program status word (PSW), which is offset X'5C' from the top of the ACB.

The address contained at location X'0C0E31' is X'083224', which is the address of the failing instruction.

By reading over from the address column starting at address X'083220' to address X'083224', you will find the failing instruction. However, you may need to note only the name of the module containing this instruction. Look in the right column and scan up until you find the first six- to eight-character module name.

										Last-entered Module	
083060	C76247F0	C77A5890	8060D203	9000C81C	58A08064	D203A000	C83447F0	C60A5E20	*G 0G	-K H	K H OF *
083080	C81C5830	80805520	300047D0	C71247F0	C60AD7C1	E3C3C840	C109C5C1	406040C1	*H	G OF	PATCH AREA - A*
0830A0	D2D8C3C8	D3E34040	F9F048F2	F2F7C7AA	C7ACC7AE	C780C782	C784C786	C788C78A	*KQCHLT	90 227G	G G G G G G *
0830C0	C78CC7BE	C7C0C7C2	C7C4C7C6	C7C8C7CA	C7CCC7CE	C7D0C7D2	C7D4C7D6	C7D8C7DA	*G G G	G8G0G8G	G G G GKGMG0G0G *
0830E0	C7DCC7DE	C7E0C7E2	C7E4C7E6	C7E8C7EA	C7ECC7EE	C7F0C7F2	C7F4C7F6	C7F8C7FA	*G G G	G5GUGWGYG	G G G0G2G4G6G8G *
083100	C7FCC7FE	C800C802	C804C806	C808C80A	C80CF250	815C9000	00000000	00000001	*G G H H H H H H H 2	*	*
083120	00000002	00000003	00000004	00000005	00000006	00000007	00000008	00000008	*		*
083140	0000000F	00000000	00004000	00008EFE	0000000F	00000168	4040F0F1	F2F3F4F5	*		*
083160	F6F7F8F9	C1C2C3C4	C5C60000	00000000	47F0F036	006C10C1	D2D8C3D4	C6C44040	*6789A8CDEF	00	AKQCMFD 012345*
083180	40F9F048	F2F2F700	47F0F01E	005447F0	F0180322	47F0F012	044647F0	F00C0538	* 90.227	00	00 00 00 *
0831A0	47F0F006	07A090EC	D00C05C0	4180CFFF	5800CF74	181D1810	59108008	4720C016	* 00		*
0831C0	00005010	806C18A1	50D0A004	98F1D010	50A0D008	18DA4AF0	F00407FF	45E0CA8C	*	1	00 *
0831E0	58908050	58E09010	4CE0CF28	5E90CF70	419E9000	58909008	5810A110	50901010	*		*
083200	58F0CF78	05EF5890	8058D201	9010CF2E	41E0CFD4	50E09014	D2039018	CF405890	* 0	K	M K *
083220	A11041E0	00000000	A0FC41F0	903450F0	A1004190	90105090	A1044190	CF345090	*	0	0 *
083240	A10858F0	CF7C4110	A0FC05EF	47F0C28A	58908050	58109010	4C10CF28	5E90CF70	* 0		*
083260	41919000	8F1F9004	5910CF4C	4740C26C	4780C1E2	5910CF64	4720C26C	4780C24A	*	08	AS B B *
083280	5F10CF4C	89100002	47F1C00C	47F0C160	47F0C17A	47F0C194	47F0C1AE	47F0C1C8	*	1	0A- 0A 0A 0A 0AH*
0832A0	47F0C26C	--SAME--							* 08		*
0832C0	47F0C26C	47F0C216	47F0C26C	47F0C26C	47F0C26C	47F0C26C	47F0C26C	47F0C26C	* 08	08 08 08 08 08 08 08 *	
0832E0	47F0C26C	47F0C26C	47F0C26C	47F0C26C	47F0C26C	47F0C26C	47F0C1FC	47F0C26C	* 08	08 08 08 08 08 0A 08 *	
083300	47F0C230	47F0C26C	47F0C26C	5890A110	41909038	5090A0FC	58F0CF80	4110A0FC	* 08	08 08	0 *
083320	05EF47F0	C28A5890	A1104190	90445090	A0FC58F0	CF844110	A0FC05EF	47F0C28A	* 08		0 08 *
083340	5890A110	41909050	5090A0FC	58F0CF88	4110A0FC	05EF47F0	C28A5890	A1104190	*	0	08 *
083360	905C5090	A0FC58F0	CF8C4110	A0FC05EF	47F0C28A	5890A110	419090E0	5090A0FC	* *	0	08 *
AKQIVP1X				08/21/90	11.14.17	CPUID=FF02411230810000					PAGE 20
083380	58F0CF90	4110A0FC	05EF47F0	C28A5890	A1104190	90EC5090	A0FC58F0	CF944110	* 0		0 *
0833A0	A0FC05EF	47F0C28A	5890A110	419090F8	5090A0FC	58F0CF98	4110A0FC	05EF47F0	* 08		0 0 *
0833C0	C28A5890	A1104190	91045090	A0FC58F0	CF9C4110	A0FC05EF	47F0C28A	5890A110	* 8		0 08 *

Address X'083224'

Scan up right-hand column to find last-entered module.

In this sample dump, the failing module is AKQCMFD.

Sample ABEND Dump Search for MVS

In searching through your ABEND dump, begin on page 1 to find the ABEND code or the completion code and PSW at entry to ABEND. Mark the completion code (the sample ABEND has the completion code identified), IBM will want to know this information if you call them.

IEF472I VEND845A STEP1 - COMPLETION CODE - SYSTEM=0C1 USER=0000 REASON=00000001

DIAGNOSTIC MESSAGE LIST

CODE	LINE	DESCRIPTION
AKQ540T		SYSTEM ABEND 0C1 OCCURRED IN PPFA/MVS PROCESS.
AKQ301I		PAGE PRINTER FORMATTING AID ENDED, MAX RETURN CODE = 16.

JOB	VEND845A	STEP	STEP1	TIME	100429	DATE	90232	ID	= 000	PAGE	00000001
COMPLETION CODE		SYSTEM = 0C1		REASON CODE = 00000001XXXXXXXXXX							
PSW AT ENTRY TO ABEND		07802000 00006CF6		ILC 2		INTC 0001					
PSW LOAD MODULE = AKQPPFA		ADDRESS = 00006CF6		OFFSET = 00000566							

Completion Code and PSW

Next look for the SAVE AREA TRACE where you will find the failing module identified. The following example has the failing module marked.

-SAVE AREA TRACE

AKQPPFA WAS ENTERED VIA LINK

AT EP AKQPPFA...90.206

SA	00005FA0	WD1	00000000	HSA	00000000	LSA	00029F88	RET	80FD9828	EPA	40006792	R0	FD000011
		R1	00005FE8	R2	00000040	R3	009F6954	R4	009F6930	R5	009F8828	R6	009DFFF8
		R7	FD000000	R8	009F86E8	R9	809F8808	R10	00000000	R11	009F8828	R12	400067AA

SA	00029F88	WD1	00000000	HSA	00005FA0	LSA	00000000	RET	00000000	EPA	00000000	R0	00000000
		R1	00000000	R2	00000000	R3	00000000	R4	00000000	R5	00000000	R6	00000000
		R7	00000000	R8	00000000	R9	00000000	R10	00000000	R11	00000000	R12	00000000

-INTERRUPT AT 00006CF6

-PROCEEDING BACK VIA REG 13

AKQPPFA WAS ENTERED VIA LINK 00898

SA	0002C790	WD1	0001C458	HSA	0002CC48	LSA	0002C710	RET	80FD9828	EPA	00014930	R0	00000010
		R1	0005F918	R2	0005FD90	R3	00000000	R4	00000000	R5	00000000	R6	00000000
		R7	00000000	R8	0002A024	R9	00000000	R10	00000000	R11	00000000	R12	00000000

AKQPPFA WAS ENTERED VIA CALL

AT EP AKQGNAG...90.222

Last-entered Module

Note: An 0C1 abend is frequently caused by a branch to location 0. The PSW in this case will usually be pointing to location 2. Normally you have to solve this type of problem by looking at the save areas of the modules (pointed to by Register 13). If the problem is caused by a call to another module (such as, unresolved reference), Register 14 will point to the instruction immediately following the BALR instruction (07FE). From there you can follow the code back to find the failing module.

Add the name of the module to your keyword string. At this point, the format of your partial keyword string is:

Component ID No.	Type-of-Failure Keyword	Module
568819001	ABEND0C4	AKQSCAN

Go to "Maintenance and Release Level Keywords" on page 23 and select the appropriate keywords.

Sample ABEND Dump Search for VM

1. Search through your ABEND dump to find the Program Status Word (PSW) that contains the interruption code and the next instruction address when the ABEND occurred.

The following diagram shows part of an example dump. In the diagram, the interruption code and the next instruction address are identified.

*****: FROM ***** TO *****									
GR 0-7	00000028	0000CCD4	00000001	0000D2E8	0000D310	0000DC58	00000088	0000DDF4	
GR 8-F	0000D024	0000D064	0000CE88	0000C718	40028C24	0000C718	A002BE28	00028C08	
FPREGS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	
PSW=	FFED0001	4002BE2E	CSW=	000060B0	0C000001	CAW=	000060A0		
000000	00040000	00EF88BC	0000BF88	00000000	00004C80	00000600	FF044000	80F4C09C	*.....4..*

Interruption Code: 0001
 Next Instruction Address: X'2BE2E'

2. Note the interruption code and then find the instruction address shown in your dump.

In this example, the interruption code is 001, and the next instruction address is X'2BE2E'. In the following diagram, a portion of a sample dump, address X'2BE2E' is identified.

3. After you find the next instruction, look in the right column and scan up until you find the first module name (6 to 8 characters starting with AKQ).

In this sample, the failing module is AKQGNAG.

02BAC0	00000000	58F0C044	18110A78	47F0C094	D5038074	C1644770	C0864120	00071E20	*.....0.....0..N...A.....*
02BAE0	8E200020	5D20C16C	18030AC8	E1FC12FF	4770C07E	1FFF47F0	C09441F0	000147F0	*...A%.....=.0...0...0..*
02BB00	C094D503	8074C168	4770C094	18FF0A30	1841186F	1F551965	4780C008	58908058	*...A.....?.....Q.....*
02BB20	D2039008	C1745050	900C4050	901058F0	C18005EF	58908054	D2039008	C1705800	*K.....&&.....0A.....K.....*
02BB40	80085A00	800C5B00	C18498EC	000C07FE	47F0C0E0	58A0804C	5040A000	5890804C	*.....S.....0.....<.....<.....*
02BB60	58009000	58908048	58109000	18E058F0	C1780E0E	58D00004	5800C17C	18185000	*.....0A.....&.....&.....*
02BB80	806C9280	D00098EC	000C07FE	07C1E3C3	C840C109	C5C14060	40C10208	C7D40540	*.%.....PATCH AREA - AKQGMN..*
02BBA0	4040F9F0	48F2F0F6	C12CC12E	C130C132	C134C136	C138C13A	C13CC13E	C140C142	* 90.206A.A.A.A.A.A.A.A.A.A.A.*
02BBC0	C144C146	C148C14A	C14CC14E	C150C152	C154C156	C158C15A	C15CC000	00000001	*A.A.A.A.A.A.A.A.A.A.A.A.A.*
02BBE0	00000002	00000003	00000008	00000102	00000192	FE000000	00000050	0002EFE0	*.....&.....&.....&.....*
02BC00	00000048	00000000	47F0F016	10C1D208	C7D5C1C7	404040F9	F048F2F1	F20090EC	*.....00..AKQGNAG..90.212...*
02BC20	D00C05C0	5800C984	181D1B10	59108008	4720C012	00005010	806C1881	50D08004	*.....I.....&.....&.....*
02BC40	9801D014	5080D008	18D80207	80481000	47000009	47000103	47000106	47000109	*.....&.....K.....:.....*
02BC60	47000111	47000113	47000115	47000117	47000119	47000121	47000123	47000125	*.....&.....K.....:.....*
02BC80	47000127	47000129	47000131	47000133	47000135	47000137	47000139	47000141	*.....&.....K.....:.....*
02BCA0	47000143	47000145	47000147	47000149	47000151	47000153	47000155	47000157	*.....&.....K.....:.....*
02BCC0	47000159	47000161	47000165	47000168	47000171	47000173	47000176	47000179	*.....&.....K.....:.....*
02BCE0	47000182	47000185	47000188	47000191	47000194	47000197	47000200	47000203	*.....&.....K.....:.....*
02BD00	47000206	47000209	47000212	47000215	47000218	47000220	47000222	47000224	*.....&.....K.....:.....*
02BD20	47000226	47000228	47000230	47000232	47000234	47000236	47000238	47000240	*.....&.....K.....:.....*
02BD40	47000242	47000244	47000246	47000248	47000250	47000252	47000254	47000256	*.....&.....K.....:.....*
02BD60	47000258	47000260	47000262	47000264	47000266	47000268	47000270	47000272	*.....&.....K.....:.....*
02BD80	47000274	47000276	47000278	47000280	47000282	47000284	47000286	47000288	*.....&.....K.....:.....*
02BDA0	47000290	47000292	47000295	47000298	47000300	47000302	47000304	47000312	*.....&.....K.....:.....*
02BDC0	47000314	47000316	47000318	47000320	47000322	47000324	47000326	47000328	*.....&.....K.....:.....*
02BDE0	47000330	47000332	47000334	47000336	47000338	47000340	47000351	47000353	*.....&.....K.....:.....*
02BE00	47000355	47000357	47000359	47000361	47000363	47000365	47000368	47000370	*.....&.....K.....:.....*
02BE20	47000381	45E0C280	47000382	00004700	03835890	804C58A0	90005890	A01C1299	*.....B.....B.....<.....*
02BE40	4700C22C	47000384	45E0C2EE	47000385	47000386	58A0804C	5890A000	58A09034	*..B.....B.....<.....*
02BE60	12AA47D0	C24E4700	038745E0	C4864700	03884700	03895890	804C58A0	90005890	*.....B.....D.....<.....*
02BE80	A0281299	47D0C270	47000390	45E0C57C	47000391	47000392	45E0C676	47000393	*.....B.....E.....<.....*

Address X'2BE2E': 47000382
 Last-entered Module: AKQGNAG
 Scan up right-hand column to find last-entered module.

4. Add the interruption code and the name of the module to your keyword string. The format of your partial keyword string is:

Component ID No.	Type-of-Failure Keyword	Module
588819001	ABEND001	AKQGNAG

5. Go to "Maintenance and Release Level Keywords" on page 23 and select the appropriate keywords.

Search Argument Procedure

Each software-support database keyword describes one aspect of a program failure. The more precisely the keyword describes the program failure, the more selective (narrow) the resulting search will be, thus yielding fewer matches.

The following procedure explains how to use the keyword string as a search argument in a software-support database.

1. Search the software-support database using the complete keyword string developed.
2. Eliminate from the list of matches those APAR fixes or PTFs that have already been applied to your system.
3. Compare each remaining closing description (APAR and PTF) with the current failure symptoms.
4. If a match and a fix are found, apply and test the fix.
5. If a match is found, but a fix for the problem is not available, notify your IBM representative so you can be contacted when a fix is available.
6. If a match is not found, broaden the search by using the following techniques. The techniques are given in the recommended order of use.
 - a. Drop keywords from the right of the search argument to broaden the search.
 - b. Consider dropping the keyword that you, as diagnostician, are least sure of.
7. If a match is still not found, go to "Calling the IBM Support Center" on page 38.

Calling the IBM Support Center

Follow these procedures if you do not have access to the software support data base, or if you do have access and the search did not find a match for your problem. Before you call the IBM Support Center to report a problem, be prepared to supply the following information:

- Customer number
- Current service level (PTF list and list of APAR fixes applied)
- Keyword string or strings used to search the software support data base
- Host processor (CPU) number (serial – model).

You may be asked to supply any or all of the following information to describe the environment, activities, or PPFA/370 functions related to the problem:

- A description of the problem.
- JCL (**MVS**), JCS (**VSE**), or system interpreter (**VM**) listings.
- Storage dump (at time of failure).
- Link-edit map.
- Console printout.
- A copy of the source listing to help reproduce the error.
- A copy of as small a portion of output as needed to illustrate the failure (sample PAGEDEF, or PAGEDEF as used by an application program).
- ABEND DUMP output (see "Types of PPFA/370 ABEND Dumps" on page 27).
- Copies of any other traces or dumps taken.
- For an *INCORROUT* – a dump listing of the form definition or the page definition in the library and the printed data.
- For a *WAIT* failure – a complete description of the resource being waited for and the program module that is waiting. This can be obtained from the module call stack, if a dump was taken, or from the partition save area.
- For a *LOOP* failure – some indication of the location of the loop. This could be one or more module names taken from the call stack or a description or an interface loop between PPFA/370 and a host program. Try to obtain at least a partial trace of the loop.
- For a *DOC* failures – the location of the error in the documentation and a description of the problem it caused.
- For a *PERFM* failure – a description of the actual performance, the expected performance, and the source of the performance specification.

APAR Preparation

An authorized program analysis report (APAR) is prepared only after the diagnostic procedures have been followed and the keyword search has been unsuccessful.

If, after you have contacted the IBM support center for assistance, a correction is not found for the problem, an IBM specialist will contact you to diagnose the problem. If the problem is determined to be a new one, the specialist will give you an APAR number to identify any material required by IBM to support the correction process.

When submitting material for an APAR to IBM, carefully pack and clearly identify any magnetic tapes. Each magnetic tape submitted must have the following information attached and clearly visible:

- APAR number assigned by IBM.
- List of files on the tape
- Description of how the tape was made, containing the following information:
 - The syntax needed to get the information from the tape
 - The exact list of commands used
 - The labeling information for the volume and its files
 - The recording mode and density
 - The record format and block size used for each file.

Each dump and any other printed materials submitted must show the APAR number.

Part 2. Diagnosis Reference

This part contains additional information about PPFA/370. The information in this part is designed to help you diagnose program failures and to help you to provide diagnostic information to IBM. This manual is not intended to supply all the information necessary for module maintenance.

Appendix A. Service Aids

PPFA/370 has the following aids for diagnosing its problems; the listings are derived from SYSLST for **VSE**, SYSPRINT for **MVS**, or LISTING file for **VM**.

1. Return-code listing

PPFA/370 messages are accompanied by return codes, indicating the severity level of an error. (See Appendix C, "Module and Message Reference" or the *Page Printer Formatting Aid/370: User's Guide and Reference*).

2. Message listing

PPFA/370 prints the text of error messages. (See the *Page Printer Formatting Aid/370: User's Guide and Reference*).

3. Input-command listing

PPFA/370 uses the SYSLST (**VSE**); the SYSPRINT (**MVS**); or a VM input command (**VM**) to print a listing of the user command stream during PPFA/370 execution.

4. Storage dump on ABEND

ABEND handling differs from VSE to MVS to VM. In **VSE**, an ABEND caused by a PPFA/370 defect is accompanied by a storage dump. An ABEND caused by a system error, however, does not result in a storage dump unless the user specifies the OPTION statement. Dumps are an effective diagnostic tool for isolating the module containing the PPFA/370 defect.

In **MVS**, an ABEND caused by either a PPFA/370 defect or a system error results in an automatic storage dump by the system *only* if the user has a SYSUDUMP or SYSABEND DD statement in the JCL used to execute the program.

In **VM**, if an ABEND is caused by either a PPFA/370 defect or a system error, the user can order a dump by using the DEBUG command and its DUMP option.

5. User-selectable hexadecimal dump of generated PPFA/370 objects

This is also handled differently from VSE to MVS to VM.

In **VSE**, you can request the Librarian to print a dump of the output form of a form definition or a page definition, showing the structured fields. For more information on printing dumps, see *VSE/AF System Control Statements*, SC33-6198.

In **MVS**, the data set utility can be used. You can use IEBTPCH or the Access Method Services (AMS) to print the dump. See *MVS/370 Utilities*, GC26-4065, or *MVS/370 Access Method Services Reference for VSAM Catalogs*, GC26-4059, for more information on these dump methods.

In **VM**, a CMS command, such as PRINT, will cause the dump to print. See *CMS Command and Macro Reference*, and *VM/SP CMS User's Guide*.

Appendix B. Control Block Directory

Control blocks are data storage areas used during PPFA/370 processing. They are located in the PPFA/370 workspace, whose size is defined in the command stream that starts PPFA/370 processing. The following table lists all the control blocks and describes the function of each control block. The *INB*, *LRB*, and *PRB* are different for each of the operating systems (MVS, VM, and VSE). All other blocks are the same.

Abbreviation	Name	Purpose
ACB	ABEND Control Block	Stores abnormal termination information
CCG	SUBGROUP Command Control Block	Stores SUBGROUP command information
CFD	FORMDEF Command Control Block	Stores FORMDEF command information
CFG	COPYGROUP Command Control Block	Stores COPYGROUP command information
CFL	FIELD Control Block	Stores FIELD command information
CFN	FONT Command Control Block	Stores FONT command information
COV	OVERLAY Command Control Block	Stores OVERLAY command information for the form definition
CPD	PAGEDEF Command Control Block	Stores PAGEDEF command information
CPR	PRINTLINE Command Control Block	Stores PRINTLINE command information
CPT	PAGEFORMAT Command Control Block	Stores PAGEFORMAT command information
CSG	SEGMENT Command Control Block	Stores SEGMENT command information
CSP	SUPPRESSION Control Block	Stores SUPPRESSION command information
CTR	TRCREf Command Control Block	Stores TRCREf command information
CUN	SETUNITS Command Control Block	Stores current values of SETUNITS command
DFN	Definition Control Block	Points to top command control block
FCB	PPFA/370 File Control Block	Stores information about files used by PPFA/370
IDA	Input Data Area	Stores input records from command stream, with programmer's comments removed
INB	Input File Control Block	Stores information for SYSIPT VSE SYSIN MVS input file VM

Abbreviation	Name	Purpose
LRB	Librarian Control Block	Stores information for form definition and page definition Libraries VSE data sets MVS object files VM
MCB	Main Control Block	Stores general information about PPFA/370 processing
MQA	Message Queuing Area	Stores diagnostic messages during PPFA/370 processing
MVL	Message Variable List	Stores variable information that can appear in diagnostic messages
POV	OVERLAY Command Control Block	Stores OVERLAY command information for the page definition
PRB	Listing File Control Block	Stores information for SYSLST VSE SYSPRINT MVS listing file VM
PRT	Printing Control Block	Stores information about PPFA/370 listings
SAM	Subarea Management Control Block	Manages subarea, the location of command control blocks
SOV	OVERLAY Subcommand Control Block	Stores OVERLAY subcommand information
SSP	SUPPRESSION Subcommand Control Block	Stores SUPPRESSION subcommand information
STX	TEXT Subcommand Control Block	Stores TEXT subcommand information
TKN	Token Element	Identifies the tokens in the command stream
TST	Token Stack	Stores tokens parsed from command stream

Appendix C. Module and Message Reference

This appendix contains two tables identifying all message IDs and the modules that issue those messages. The first table is in message IDs order and the second table is in alphabetic order by module name. For information about the meaning of return codes and error messages, see *Page Printer Formatting Aid/370: User's Guide and Reference*.

Message-to-Module Reference

The following table presents all PPFA/370 diagnostic messages in numerical order and shows the modules that can issue them.

Message ID	Return Code	Module Name
AKQ001E	08	AKQRDDT
AKQ002E	08	AKQRDDT
AKQ003E	08	AKQGTTK
AKQ004E	08	AKQGTTK
AKQ101E	08	AKQBFD AKQBPD AKQSCAN
AKQ102E	08	AKQGTCM
AKQ103E	08	AKQCMFD AKQCMPD AKQCUN AKQOVR
AKQ104E	08	AKQSBCM AKQSBFD
AKQ105E	08	AKQCUN AKQCFC AKQSBCM AKQSBFD AKQSBPD
AKQ106E	08	AKQSBCM
AKQ107E	08	AKQCMPD AKQCFC AKQCUN AKQSBCM AKQSBFD AKQSBPD
AKQ108E	08	AKQSBCM AKQCFC AKQSBFD AKQSBPD
AKQ109E	08	AKQCMPD
AKQ110E	08	AKQCMPD AKQCRPD AKQSBFD AKQSBPD
AKQ111E	08	AKQSBPD
AKQ112E	08	AKQCMPD
AKQ113E	08	AKQSBPD
AKQ201E	08	AKQCRPD
AKQ202E	08	AKQCRFD AKQCRPD
AKQ203W	04	AKQCRFD AKQCRPD
AKQ204E	08	AKQCRFD AKQCRPD
AKQ205E	08	AKQCRPD
AKQ206E	08	AKQCRPD
AKQ211E	08	AKQCRFD
AKQ212W	04	AKQCRFD
AKQ214E	08	AKQCRFD
AKQ215E	08	AKQCRFD
AKQ216E	08	AKQCRFD

Message ID	Return Code	Module Name
AKQ217W	04	AKQCRFD
AKQ218E	08	AKQCRFD
AKQ219E	08	AKQCRFD
AKQ220E	08	AKQCRFD
AKQ221E	08	AKQCRFD
AKQ222W	04	AKQCRFD
AKQ223E	08	AKQCRFD
AKQ224E	08	AKQCRPD
AKQ225E	08	AKQCFC
AKQ226E	08	AKQCRFD
AKQ231E	08	AKQCRPD
AKQ232E	08	AKQCRPD
AKQ233E	08	AKQCRPD
AKQ234W	04	AKQCRPD
AKQ235E	08	AKQCRPD
AKQ238E	08	AKQTXPD
AKQ239E	08	AKQCRPD
AKQ240E	08	AKQCRPD
AKQ241E	08	AKQCRPD
AKQ242E	08	AKQCRPD
AKQ243E	08	AKQCRPD
AKQ244E	08	AKQCRPD
AKQ245E	08	AKQCRPD
AKQ246E	08	AKQCRPD
AKQ247E	08	AKQCRPD
AKQ248E	08	AKQCRPD
AKQ249E	08	AKQSBPD
AKQ250E	08	AKQTXPD
AKQ251W	04	AKQCRPD
AKQ252E	08	AKQCRPD
AKQ253E	08	AKQCRPD
AKQ254E	08	AKQCRPD
AKQ301I	00	AKQTERM
AKQ302I	00	AKQSCAN
AKQ303S	12	AKQSCAN
AKQ304S	12	AKQSCAN
AKQ305S	12	AKQGNFD AKQGNPD
AKQ311I	00	AKQGNFD
AKQ312I	00	AKQGNFD
AKQ313E	08	AKQSCAN

Message ID	Return Code	Module Name
AKQ321I	00	AKQGNPD
AKQ322I	00	AKQGNPD
AKQ323E	08	AKQSCAN
AKQ350T	16	AKQGNCC
AKQ401E	08	AKQINIT
AKQ402T	16	AKQGMN AKQGNMS AKQTBL
AKQ403T	16	AKQFMN
AKQ404T	16	AKQINIO
AKQ410T	16	AKQLBIO
AKQ411T	16	AKQLBIO AKQSCAN
AKQ412T	16	AKQLBIO
AKQ413T	16	AKQLBIO
AKQ414T	16	AKQLBIO
AKQ415T	16	AKQLBIO AKQSCAN
AKQ416T	16	AKQLBIO
AKQ417T	16	AKQLBIO
AKQ418T	16	AKQLBIO
AKQ420T	16	AKQERRD
AKQ421T	16	AKQLBIO
AKQ422T	16	AKQLBIO
AKQ501T	16	AKQINIO
AKQ502T	16	AKQINIO
AKQ503T	16	AKQINIO
AKQ504T	16	AKQINIO
AKQ510T	16	AKQLBIO
AKQ511T	16	AKQLBIO
AKQ512T	16	AKQLBIO
AKQ513T	16	AKQLBIO
AKQ514T	16	AKQLBIO
AKQ515T	16	AKQLBIO
AKQ516T	16	AKQLBIO
AKQ517T	16	AKQLBIO
AKQ518T	16	AKQLBIO
AKQ519T	16	AKQLBIO
AKQ520T	16	AKQLBIO
AKQ521T	16	AKQLBIO
AKQ522T	16	AKQLBIO
AKQ540T	16	AKQERRM
AKQ541T	16	AKQERRM
AKQ600T	20	AKQCHEX

Message ID	Return Code	Module Name
AKQ601T	20	AKQCHEX
AKQ602T	20	AKQCHEX
AKQ603T	20	AKQCHEX
AKQ604T	20	AKQCHEX
AKQ605T	20	AKQCHEX
AKQ606T	20	AKQCHEX
AKQ607T	20	AKQCHEX
AKQ608T	20	AKQCHEX
AKQ610T	20	AKQCHEX
AKQ611T	20	AKQCHEX
AKQ612T	20	AKQCHEX
AKQ613T	20	AKQCHEX
AKQ620T	16	AKQINIO
AKQ621T	16	AKQINIO AKQLBIO
	20	AKQPRIO
AKQ622T	16	AKQINIO
AKQ624T	16	AKQINIO AKQLBIO
	20	AKQPRIO
AKQ625T	16	AKQLBIO
AKQ639T	16	AKQERRV
AKQ640T	16	AKQERRV
AKQ641T	16	AKQERRV

Module-to-Message Reference

The following table presents the modules in alphabetical order and shows the return codes of the message IDs they issue.

Module Name	Return Code	Message ID				
AKQBFD	08	AKQ101E				
AKQBPD	08	AKQ101E				
AKQCFC	08	AKQ105E	AKQ107E	AKQ108E	AKQ225E	
AKQCHEX	20	AKQ600T	AKQ601T	AKQ602T	AKQ603T	AKQ604T
		AKQ605T	AKQ606T	AKQ607T	AKQ608T	AKQ610T
		AKQ611T	AKQ612T	AKQ613T		
AKQCMFD	08	AKQ103E				
AKQCPD	08	AKQ103E	AKQ107E	AKQ109E	AKQ110E	AKQ112E
AKQCRFD	04	AKQ212W	AKQ217W	AKQ222W		
	08	AKQ202E AKQ216E AKQ223E	AKQ204E AKQ2178 AKQ226E	AKQ211E AKQ219E	AKQ214E AKQ220E	AKQ215E AKQ221E
AKQCRPD	04	AKQ203W	AKQ234W	AKQ251W		
	08	AKQ110E	AKQ201E	AKQ202E	AKQ204E	AKQ205E
		AKQ206E	AKQ224E	AKQ231E	AKQ232E	AKQ233E
		AKQ235E	AKQ239E	AKQ240E	AKQ241E	AKQ242E
		AKQ243E	AKQ244E	AKQ245E	AKQ246E	AKQ247E
	AKQ248E	AKQ252E	AKQ253E	AKQ254E		
AKQCUN	08	AKQ103E	AKQ105E	AKQ107E		
AKQERRD	16	AKQ420T				
AKQERRM	16	AKQ540T	AKQ541T			
AKQERRV	16	AKQ639T	AKQ640T	AKQ641T		
AKQFMN	16	AKQ403T				
AKQGMN	16	AKQ402T				
AKQGNCC	16	AKQ350T				
AKQGNFD	00	AKQ311I	AKQ312I			
	12	AKQ305S				
AKQGNMS	16	AKQ402T				
AKQGNPD	00	AKQ321I	AKQ322I			
	12	AKQ305S				
AKQGTCM	08	AKQ102E				
AKQGTTK	08	AKQ003E	AKQ004E			
AKQINIO	16	AKQ404T	AKQ501T	AKQ502T	AKQ503T	AKQ504T
		AKQ620T	AKQ621T	AKQ622T	AKQ624T	
AKQINIT	08	AKQ401E				
AKQLBIO	16	AKQ410T	AKQ411T	AKQ412T	AKQ413T	AKQ414T
		AKQ415T	AKQ416T	AKQ417T	AKQ418T	AKQ421T
		AKQ422T	AKQ510T	AKQ511T	AKQ512T	AKQ513T
		AKQ514T	AKQ515T	AKQ516T	AKQ517T	AKQ518T
		AKQ519T	AKQ520T	AKQ521T	AKQ522T	AKQ621T
		AKQ624T	AKQ625T			

Module Name	Return Code	Message ID
AKQOVR	08	AKQ103E
AKQPRI	20	AKQ621T AKQ624T
AKQRDDT	08	AKQ001E AKQ002E
AKQSBCM	08	AKQ104E AKQ105E AKQ106E AKQ107E AKQ108E
AKQSBFD	08	AKQ104E AKQ105E AKQ107E AKQ108E AKQ110E
AKQSBPD	08	AKQ105E AKQ107E AKQ108E AKQ110E AKQ249E
AKQSCAN	00	AKQ302I
	08	AKQ101E AKQ313E AKQ323E
	12	AKQ303S AKQ304S
	16	AKQ411T AKQ415T
AKQTL	16	AKQ402T
AKQTERM	00	AKQ301I
AKQTXPD	08	AKQ238E AKQ250E

Appendix D. Register Conventions

The following table shows the contents of registers during execution of a module.

Register	Content
1	Address of parameter list.
8	Address of main control block.
13	Address of save area used by current module.
14	Address of instruction in calling module to which control is returned after current module has finished executing.
15	Address of current module's entry point on entry to the module.

Glossary

This glossary defines all new terms and abbreviations that are used in *Page Printer Formatting Aid Diagnosis Guide and Reference*, LV32-0511. It also includes terms and definitions from *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699, as well as definitions developed by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). This material is reproduced in part from the *American National Dictionary for Information Processing*, Copyright 1977, by the Computer and Business Equipment Manufacturers Association, copies of which may be purchased from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

A

ABEND. Abnormal end of task.

abnormal end. Termination of processing of a task prior to its completion, because of an error that cannot be resolved by recovery facilities while the task is executing.

active environment group. An internal object that defines the environment for formatting an entire page, including font selection and page size. Part of a data map.

ADJUST subcommand. Specifies the adjustment range of the position of the print area on the sheet that is available to the printer operator (3800 printers only).

APAR. Authorized program analysis report.

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

B

BACK subcommand. Specifies that a subgroup will control the printing on the back sides of sheets of a printout.

BIN subcommand. Identifies the paper source on the printer to use in a printing job.

BOTH subcommand. Specifies that a subgroup will control the printing of both sides of sheets in a duplex printing job.

C

carriage control character. If present, the first character of an output record (one line of print). It determines the print position of the line, along with a CHANNEL subcommand in a page definition.

CHANNEL subcommand. Part of a PRINTLINE command; with a carriage control character, controls the position of a line in a printout.

command. Major control statement in a PPFA/370 command stream. Commands are further specified by nested subcommands and parameters.

command stream. The sequence of PPFA/370 commands that is submitted with the job control statements in a PPFA/370 execution. The commands and subcommands are the control statements that define the object or objects to be generated.

control block. Storage area obtained during PPFA/370 execution, used to store user-defined information and other execution values.

COPIES subcommand. Determines the number of copies of a subgroup that will be printed.

copy group. A subset of a form definition that contains controls for the physical sheets of a print job. Governed by the COPYGROUP command.

COPYGROUP command. Defines a copy group.

D

data map. An internal object whose structured fields control the formatting of data on a logical page of a printout. Created by a PAGEDEF command or a PAGEFORMAT command.

data map transmission subcase. An internal object that controls printing of line data. One must appear in each data map of a page definition.

DBCS subcommand. Specifies that a font is a double byte character set.

DIRECTION subcommand. Determines the print direction of a page, line, or field.

document environment group. An internal object that, with a medium map, makes up a form definition. Contains controls to select overlays and suppressions. It shares the control capability with medium maps of being able to specify the starting position of printing on the sheets of a printout.

DUPLEX subcommand. Specifies that printing will be done on both sides of the form.

F

FLASH subcommand. Specifies that a subgroup will be printed using a forms overlay negative (IBM 3800 Printing Subsystem Models 3, 6, and 8 only).

FONT command. Names a font within a page definition.

FONT subcommand. Specifies a font within a PRINTLINE command or a TRCREF command.

FORMDEF command. Specifies controls for the physical sheets of a printout.

form definition. A resource object that performs physical-sheet management in print jobs. It controls such items as number of copies, paper source used in the job, beginning location on the sheets for printing, and duplex printing.

FRONT subcommand. Specifies that a subgroup will control the printing on the front sides of the sheets of a printout.

H

HEIGHT subcommand. Specifies the height of a logical page.

I

INCORROUT. A diagnosis keyword designating incorrect output. Output other than that specified.

internal object. Groups of structured fields that can be included as part of a resource object. They cannot be accessed apart from resource objects in printing jobs they are part of.

J

job control language (JCL). User-specified controls to define and execute jobs under MVS.

job control statements (JCS). User-specified controls to define and execute jobs under VSE.

JOG subcommand. Specifies that the output of copy groups will be offset stacked from the output of the previous copy group in the printer's output hopper.

L

LENGTH subcommand. Specifies the length of a field in the user's data selected for mapping by a field command.

LINEONE subcommand. Identifies the position for the MARGIN and TOP parameters of a PRINTLINE POSITION subcommand.

LOGICAL PAGE. The boundary for determining the limits of printing.

M

medium map. An internal object whose structured fields control the physical sheets of a printout, including the choice of duplex printing, the beginning print position, and the paper source to use. Controlled by a COPYGROUP command in a PPFA/370 command stream.

medium overlay. Names overlays to be used in one or more subgroups of a copy group.

O

OFFSET subcommand. Specifies the origin of a logical page using x and y offsets from the hardware origin. The offset can be unique to each side of the form.

OVERLAY command. (1) Names overlays to be used in one or more subgroups of a copy group.
(2) Names overlays to be used in one or more page formats.

OVERLAY subcommand. Nested in a subgroup, identifies overlays to appear in the output controlled by that subgroup.

P

PAGEDEF command. Creates a page definition specifying the controls for formatting data on the logical page of a printout.

page definition. A resource object that performs text management for print jobs, including such functions as controlling the number of lines per page, controlling the size of logical page (printing area on the sheets), and mapping of data to the output, field by field.

page format. A subset of a page definition, containing controls governing the arrangement of text on a page. Controlled by the PAGEFORMAT command.

PAGEFORMAT command. Creates a page format, a subset of a page definition. Specifies formatting of data on the logical page of a printout.

Page Printer Formatting Aid/370 (PPFA/370). An IBM licensed program (Program No. 5688-190) that allows for creation and storage of form definitions and page definitions—resource objects for print-job management.

page overlay. Names overlays to be used in one or more page formats.

parameter. In PPFA/370, controls nested within a subcommand.

PRINTLINE command. Defines a print line, a set of controls governing one or more output lines of print on a logical page.

POSITION subcommand. Specifies the starting print position of a line or field.

R

RASTER|NORASTER subcommand. Specifies whether an overlay is to be kept in the printer (3800 only) as raster data.

REPEAT subcommand. Specifies the number of output lines to be controlled by a single PRINTLINE command.

REPLACE subcommand. Specifies that this form definition or page definition with the same resource name as one contained in a library will replace the one in the library.

ROTATION subcommand. Specifies the rotation parameter for the characters in a font.

S

SBCS subcommand. Specifies that a font is a single byte character set.

SEGMENT command. Specifies the inclusion of a page segment in a page definition.

START subcommand. (1) Specifies the starting location of a field within a record that is mapped to the output by a FIELD command. (2) Specifies the starting location of a field within a record that will be tested to determine a print action by CONDITIONAL processing.

structured field. A self-identifying string of bytes and its data or parameters.

subarea. Storage space allocated to PPFA/370 command processing.

subcommand. In PPFA/370, the controls nested within a command.

subgroup. A subset of a copy group and of a form definition. Defines the modifications that apply to the versions of a single page of data in a print job. Modifications include overlays and suppressions used with the subgroup.

SUBGROUP command. Creates a subgroup, a subset of a copygroup.

sublibrary. A portion of a library in VSE for storing a particular type of resource such as form definitions, page definitions, overlays, and fonts.

suppression. A control applied to a field of data that provides for its selective inclusion or exclusion in various output versions of a page of data.

SUPPRESSION command. Identifies suppressions by name that are used in a form definition.

SUPPRESSION subcommand. As part of a FIELD command, identifies the field as capable of being selectively suppressed. As part of a SUBGROUP command, relates the suppression to a particular version of a page's output.

T

table reference character (TRC). A numeric character referencing the fonts that have been specified. Used for selection of fonts during printing.

TEXT subcommand. Specifies that a FIELD command will map a fixed-text field to the output. Includes the character string of the text.

token. An item in the command stream that PPFA/370 recognizes as a distinct entity.

TRCREf command. In a page definition, relates a font to a TRC in the data.

U

units. Measurement values used to define print increments; IN — inches, MM — millimeters, CM — centimeters, POINTS, PELS — picture elements, LPI — lines-per-inch, CPI — characters-per-inch.

W

WIDTH subcommand. Specifies the width of a logical page. Nested under a page definition.

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