



# IBM BASIC/VM Diagnosis Guide

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### First Edition (February 1986)

This edition applies to Release 2 of IBM BASIC/VM, Program Product 5668-996, and to any subsequent releases until otherwise indicated in new editions or technical newsletters. Information in this edition was previously contained in SY26-3905, which now applies to Release 1 only.

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

Changes are periodically made to the information herein; 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 explains how to diagnose failures in IBM BASIC/VM. It assumes that you have already determined that the suspected failure is not a user error; that is, it was not caused by incorrect usage of IBM BASIC/VM, or by an error in the logic of the application program. (For more information on diagnosing usage errors, see *IBM BASIC Programming Guide*.)

The fastest way to resolve the problem is to determine if IBM already has a correction. To find out whether or not the problem is known, you first need to describe the problem with "keywords." A keyword is a predefined word or abbreviation that describes one aspect of the failure. A set of such keywords is used as a search argument in an IBM software support data base such as the Software Support Facility (SSF) or the Early Warning System (EWS).

SSF is an IBM online data base that contains information about all current Authorized Program Analysis Reports (APARs) and Program Temporary Fixes (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 people often have expertise in helping you improve your search argument. If the problem that occurred has been documented previously, the IBM support center personnel then retrieve the records that describe the problem and the correction.

You may also be able to find a problem similar to yours and a correction to the problem by using a search tool such as the Early Warning System (EWS). EWS is a microfiche copy of the data contained in SSF, organized by component ID number and indexed by APAR symptom code. EWS is published monthly and is available to all IBM customers.

When the problem is already described in the software support data base with the same set of keywords, the search yields matching descriptions of the problem, and there is usually a known correction. If there is no APAR on record, use the keywords to describe the failure when contacting the IBM support center for assistance. (Keywords are intended to ensure that any two people will identically describe the same type of problem caused by the same program error.)

After completing your set of keywords and searching the software support data base without finding a match, you are ready to contact the IBM support center. You may contact your IBM support center by phoning the center that is closest to your location. The phone number you should call is shipped with the product or may be found in *IBM Field Engineering Programming System General Information*, G229-2228. If more information is needed, a product specialist will contact you.

## How this Book is Organized

“Introduction” gives an overview of the diagnosis procedure. It explains the concepts of using keywords to describe program failures and of using sets of keywords to search a software support data base.

“Component Identification Keyword” gives you the IBM component identification number for use as the first keyword in the search argument.

“Release Level Keyword” explains how you determine the release level of the IBM BASIC product in order to include it in your set of keywords.

“Type-of-Failure Keyword” describes an external symptom of a program failure. The types of failure appropriate to IBM BASIC/VM are defined, and procedures for each type are explained.

“Modifier Keyword” uses the problem symptom to gradually narrow the area of the code that could contain the error. The keyword used from this section names the language element or command, option, or mode that caused the failure.

“Search Argument Procedure” explains how to use your set of keywords as a search argument in the software support data base.

“Techniques for Varying the Search Argument” explains how to vary the search argument by narrowing or broadening it. This section includes only those techniques that are unique to this product.

“APAR Preparation Procedure” identifies the specific information the diagnostician will be asked to supply to initiate an Authorized Program Analysis Report (APAR).

## Required Publications

*IBM BASIC/VM Licensed Program Specifications, GC26-4024*

*IBM BASIC/VM Installation and Customization, SC26-4025*

| *IBM BASIC Language Reference, GC26-4026*

| *IBM BASIC Programming Guide, SC26-4027*

| *IBM BASIC/VM System Services, SC26-4028*

## Related Publications:

*Virtual Machine/System Product:*

*System Messages and Codes, SC19-6204*

*CMS Command and Macro Reference, SC19-6209*

*CP Command Reference for General Users, SC19-6211*

## Summary of Amendments

### IBM BASIC/VM Release 2, February 1986

Minor technical and editorial changes. The Appendix has been updated for new keywords and new intrinsic functions for Release 2.

### IBM BASIC/VM Release 1.1

#### New Title

The title of this manual has been changed from *IBM BASIC Diagnosis Guide* to *IBM BASIC/VM Diagnosis Guide*.

#### Service Changes

Except for several minor technical changes and some structural and editorial changes, the content of this book remains as it was. The following types of changes have been made:

- The Program Check (PROGCK) type-of-failure keyword and its procedure have been removed
- A section on “Techniques for Varying the Search Argument” has been added

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## Introduction

This book explains how to build a set of keywords that describe a failure in the IBM BASIC/VM Program Product. It is designed to eliminate irrelevant information and give a concise description of the problem.

When a BASIC product failure occurs, you can best describe the problem through the use of keywords which are agreed-upon words or abbreviations that describe particular aspects of a program failure. A set of keywords defines the entire problem.

The keyword search procedure is basically the same for all IBM products. First, you should eliminate the possibility of user error, and then identify the program failure by following the diagnostic procedures described in this book. You should use your set of keywords to search a software support data base to find a problem similar to yours. If you find a similar problem, there is probably an available correction. If you cannot find a correction or a similar known problem initially, you may use your set of keywords to describe the failure when contacting the IBM support center for assistance.

The procedures defined in this publication are designed to ensure that most people will select the same set of keywords when they are working on the same problem.

## Identifying the Problem

The first steps you should follow in building the correct set of keywords are identifying the problem and gathering the diagnostic information you will need. The recommended sequence in identifying the problem is:

1. Correct any problems diagnosed by BASIC messages, and ensure that any messages previously generated are not related to the current problem.
2. If the problem is occurring during execution, use the BASIC DEBUG statement to identify the nature of the problem. For example, determine it is not a user error by identifying the statement in control and verifying that the statement is specified correctly.

For detailed information on the use of DEBUG statements, see *IBM BASIC Programming Guide*.

3. If the program has been changed since it was last compiled or executed successfully, examine the changes. If the error is occurring in the changed code and cannot be corrected, note the change that caused the error. If possible, retain copies of both the original and changed programs.

4. When you have explored and identified the failure, it is very helpful to write a small test case that re-creates the problem. This test case should help you choose keywords that best describe the failure and will help IBM quickly pinpoint the problem. This test case may be necessary later, as documentation, if opening an APAR.

Once you have identified the problem, the next step is to establish your set of keywords.

## Building your Set of Keywords

Each keyword describes one aspect of a program failure, and, because the search criterion is based on a set of keywords, the order of keywords is important to broaden or narrow the search. The first keyword specifies the component identification number for the IBM BASIC/VM product. A search of the IBM software support data base with this keyword alone would detect all reported problems in the IBM BASIC/VM product. Each additional keyword makes the search argument descriptions more specific, thereby reducing the number of problem descriptions to be examined. The component identification keyword, release level keyword, and type-of-failure keyword are required in your set of keywords. In addition to that particular set of keywords, one or more modifier keywords may be added to give more precise information about the problem.

*Note:* Throughout this book, the general name *software support data base* is used to represent the IBM Software Support Facility (SSF), the Early Warning System (EWS), and any other search tools that are available.

In some cases, you might locate a correction for a problem with less than a full set of keywords. If circumstances make it difficult to follow the instructions given for choosing a keyword, you may omit that keyword. But, in general, if you contact the IBM support center for assistance, you will be asked to identify your problem with the full set of keywords.

A full set of keywords contains the following elements:

- Component identification keyword
- Release level keyword
- Type-of-failure keyword
- Modifier keywords

The choice of keywords partly depends on the type of failure that has occurred. No matter what type of failure occurred, you should include the Component Identification Keyword, the Release Level Keyword, and a Type-of-Failure Keyword. Modifier Keywords are used for all types of failure except DOC.

Finally, regardless of which type of failure has occurred, you should use the "Search Argument Procedure" to learn how to search with your set of keywords. If the search proves unsuccessful, you may need to narrow or broaden your search argument by using "Techniques for Varying the Search Argument." If your search is still unsuccessful, you should prepare documentation as recommended under "APAR Preparation Procedure" and then contact the IBM Support Center.

## Component Identification Keyword

The Component Identification number is the first keyword in your set of keywords. It identifies the library within the software support data base that contains Authorized Program Analysis Reports (APARs) and Program Temporary Fixes (PTFs) for the product. This number is always your first keyword and should be used with at least one other keyword to search the software support data base.

The Component Identification keyword for BASIC is **566899601**.

To continue building your set of keywords, turn to "Release Level Keyword" on page 4 to determine what your second keyword should be.

## Release Level Keyword

The release level is the second keyword in your keyword list. When used in conjunction with the Component Identification Keyword, it will narrow the symptom search to your specific release level. Use the following procedure to determine your release level keyword and include it in your set of keywords.

### Procedure

1. Locate the VERSION x RELEASE y.z line at the top of your latest listing or log file (or from the invocation message). The x stands for the version number, the y is the release number, and the z is the level number. For example:

```
IBM BASIC/VM VERSION 1 RELEASE 2.0 1985/06/01 09:23
```

The version number (x) is 1, the release number (y) is 2, and the level number (z) is 0.

This line also contains the date and time of processing.

2. The release level keyword is a 4-digit keyword in the form Ryzz, where the release number corresponds to the y, and the level number corresponds to the zz. If the level number is only one digit, replace the second z with a 0; if it is 2 digits, fill in both level number positions with those digits.

Substitute the levels obtained from the source mentioned above as shown:

```

R Y Z Z
  | | |
  | | |
  V V V
R 2 0 0

```

To continue building your set of keywords and to find what type-of-failure keyword to use for your individual program failure, turn to "Type-of-Failure Keyword" on page 5.

## Type-of-Failure Keyword

The third keyword in your set of keywords identifies the type of failure that occurred. Select one keyword from the list below that best describes the problem and then go to the specific procedure for that keyword. If more than one keyword describes the problem, use the one that appears first in the list.

Keyword	Type of Failure
MSGx	A message tells of an error, or seems itself to be erroneous. (However, if the message indicates an abend, use the ABENDx keyword instead.) See "MSGx."
ABENDx	The BASIC product has terminated with an abend. See "ABENDx" on page 7.
WAIT or LOOP	The program is not responding or is executing the same sequence repetitively. See "WAIT or LOOP" on page 7.
INCORROUT	Output from the program is missing or invalid. See "INCORROUT" on page 8.
PERFM	Performance of the program is degraded. See "PERFM" on page 9.
DOC	Information is missing or incorrect in one of the IBM BASIC publications. See "DOC" on page 10.

### MSGx

Use this keyword for any of these conditions:

- A message is issued indicating a BASIC program error.
- A message is issued under some set of conditions that should not have caused it to be issued.
- A message contains invalid data or is missing data.

Do not use this procedure if the message indicates that BASIC terminated with an abend. For example, the operating system message:

DMSABN148T SYSTEM ABEND 15A CALLED FROM 102BDA.

indicates that you should use ABENDx procedure instead.

Each IBM BASIC Processor or Library message contains an 8-character message identifier, followed by the severity level indicator, followed by the message text. The message identifiers for all messages issued by BASIC are prefixed with either BAS or BLI.

If the message identifier does not precede the message, in order to see the message identifier issue the following commands:

```
SET MSG(I) ALL
SET MSG(W) ALL
SET MSG(E)ALL
SET MSG(S) ALL
```

and rerun the program.

## Procedure

1. Use MSGx as the type-of-failure keyword.
2. Replace the x of MSGx with the 8-character message identifier.
3. Add the severity level indicator to the end.

Examples:

If the BASIC message identifier is BAS00021S, your set of keywords would look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	MSGBAS00021S

Additional explanation about a specific BASIC message can be obtained by issuing the diagnostic HELP command (HELP followed by the message identifier).

If the message identifier generated by the operating system was IEC030I, your set of keywords would look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	MSGIEC030I

If applicable, the CMS HELP command may also be used to obtain more information about operating system messages.

4. Continue the diagnostic procedure with "Modifier Keyword" on page 12.

## ABENDx

Use this keyword when BASIC terminates with an operating system message indicating an abend. For example:

DMSABN148T SYSTEM ABEND 15A CALLED FROM 102BDA.

### Procedure

1. Use ABENDx as the type-of-failure keyword.
2. Replace the x of ABENDx with the abend code from the operating system message. This will be a 3-digit hexadecimal number.

Hence, for the example above:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	ABEND15A

3. Continue the diagnostic procedure with "Modifier Keyword" on page 12.

## WAIT or LOOP

Use this keyword when a program is not responding or is executing the same sequence repetitively.

### Procedure

1. Monitor the progress of your virtual machine by using the CP command **INDICATE USER**. (See *IBM BASIC/VM System Services* for information on how to get to CP mode.) If you can get no response from CP, you probably have a system problem. You should contact your system administrator to help verify and/or resolve the problem.

2. If you issue the INDICATE USER command and no progress is made, use the WAIT type-of-failure keyword. For example:

```
Component Identification Number    566899601
Release Level                      R200
Type-of-Failure Keyword           WAIT
```

You should read through step 3 to verify that WAIT, not LOOP, is your type-of-failure keyword; choose only one of them. If WAIT is your type-of-failure keyword, proceed with step 7.

3. If the result of the INDICATE USER shows that the program is continuing execution, use the LOOP type-of-failure keyword.
4. If the failure occurred during the execution of your BASIC program, you probably have a user error. Carefully check your BASIC source program to be sure it does not contain an endless loop. Adding DEBUG or PRINT statements and rerunning may help to detect a loop.
5. If the problem is not caused by a user error, terminate the program by storing X'0000' in the location given in the current PSW (see *IBM VM System Product CP Command Reference for General Users* for 'display' and 'store' commands).
6. When BASIC terminates abnormally, the current module name, and address within that module, will be displayed. Use the indicated module name as a modifier under type-of-failure keyword.

For example:

```
Component Identification Number    566899601
Release Level                      R200
Type-of-Failure Keyword           LOOP
Modifier                           BASBPOP
```

7. Continue the diagnostic procedure with "Modifier Keyword" on page 12.

## INCORROUT

Use this keyword when the output appears to be invalid or missing.

### Procedure

1. Use INCORROUT as the type-of-failure keyword.
2. From the following list, select a keyword that best describes the error in output, and add it to your set of keywords.

Keyword	Type of Incorrect Output
MISSING	Some expected output is missing.
DUPLICATE	Some data or records are duplicated, but not repeated endlessly (in that case, use the LOOP keyword).

**INVALID** Output appears, but it is incorrect.

For example:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	INCORROUT
Modifier	MISSING

3. If the output generated by the compiler or the **COMPILE** command appears to be invalid or missing, select a modifier keyword that describes the type of output in which the error occurred and add it to your set of keywords.

<b>Keyword</b>	<b>Location of Incorrect Output</b>
<b>SOURCE</b>	Source listing
<b>OBJECT</b>	Machine-language object program
<b>LIST</b>	Object listing
<b>XREF</b>	Cross-reference listing
<b>MAP</b>	Allocation map listing

For example, if the object program were incorrect, your set of keywords would look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	INCORROUT
Modifiers	INVALID OBJECT

4. Continue the diagnostic procedure with "Modifier Keyword" on page 12.

## PERFM

Performance problems are often caused by the inappropriate selection of program options. This keyword should be used when the performance problem cannot be corrected by selecting different options.

There is a difference between a performance problem, as indicated by the **PERFM** type-of-failure keyword, and performance tuning. If you have noticed a recent and abrupt change in performance, the **PERFM** keyword is probably warranted. If, however, you have been displeased with some aspect of performance for a period of time, you may need to refer to the various **BASIC** publications in order to better understand and perhaps improve that aspect of performance. For example, the execution speed of a **BASIC** program can often be increased by compiling and executing it in a batch-type environment, as opposed to interactive execution.

**Procedure**

1. Use PERFM as the type-of-failure keyword.
2. Record the actual performance, the expected performance, and the source of the expected performance criteria. This might be in terms of execution times, number of I/Os performed, or amount of storage used. Most likely you will be comparing current values with previous ones, or two values from the same version of the product but invoked with different options.

Doing this will help you verify that you do have a performance problem, and you will be better able to explain your problem to the IBM support center. At this point, your set of keywords will look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	PERFM

3. Continue the diagnostic procedure with "Modifier Keyword" on page 12.

**DOC**

Use this keyword when a program problem appears to be caused by incorrect or missing information in one of the IBM BASIC publications.

**Procedure**

1. Ensure that the version and release level of the document match the version and release level of your BASIC product. Your product release level may be determined from the VERSION x RELEASE y.z line at the top of any BASIC listing, or from the invocation message. The applicable version of a document is found in the edition notice on the back of the cover page of the document.
2. Use DOC as the type-of-failure keyword.
3. Use the order number of the document as a modifier keyword. Delete the first hyphen, and replace the second hyphen with the digit 0. For example, instead of LY26-3879-0, use LY26387900 as a modifier keyword.

For example:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	DOC
Document Order Number	LY26387902

4. If this is a documentation deficiency, such as missing or misleading information, which may cause user errors or a considerable loss of time, contact the IBM support center after preparing documentation which includes the following:
  - Text location of the error in the manual
  - Description of the problem the DOC deficiency caused
5. If the documentation problem is less severe, fill out the Reader's Comment Form attached to the back of the manual to suggest improvements to the publication.
6. Continue the diagnostic procedure with "Search Argument Procedure" on page 15.

## Modifier Keyword

The procedures in this section use the problem symptoms to gradually narrow the area of the code that could contain the error.

There are three procedures to try:

- Language Element or Command
- Processing Option
- Processing Mode

After applying each of these procedures in turn, continue the diagnostic procedure with "Search Argument Procedure" on page 15.

### Language Element or Command

1. If the problem occurs during the execution of a BASIC command, rather than during the execution of a BASIC program, use that command name as the modifier keyword. Although BASIC accepts abbreviations for most commands, you should use the full name as your keyword.

Select the command name from the list below:

AUTO	PURGE
BREAK	QUERY
CHANGE	QUIT
COMPILE	RENAME
COPY	RENUMBER
DELETE	RUN
DROP	SAVE
EXTRACT	SET
FETCH	SET LOG
FIND	SET MSG
GO	SET OPTION
HELP	SET PF
INITIALIZE	SET PROFILE
LIST	SET TERM
LOAD	STORE
MERGE	SYSTEM
PROFILE	

2. If you are having problems with HELP panels, you can use the associated panel identifier if it is available. For example, if you requested help for the FETCH command and did not get a HELP panel, your set of keywords would look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	INCORROUT
Modifier	MISSING
Area of Failure	HELP
Panel Identifier	FETCH

3. If the problem occurs during the execution of an BASIC program, use as a keyword the BASIC language element that best describes the area of the problem. If more than one keyword applies, you may use any number in your set of keywords. This is important if you need to vary your search area because of too many or too few hits when you first search the data base (see "Techniques for Varying the Search Argument" on page 16).

The BASIC DEBUG statement is usually helpful in isolating and identifying the language element that is causing the problem. For detailed information on the use of the DEBUG statement, refer to the *IBM BASIC Programming Guide*.

Language element keywords may be selected from either of the lists in "Appendix" on page 20.

#### Processing Option

4. If the problem occurs or does not occur depending on the IBM BASIC/VM options used, add to your set of keywords the option name that causes the problem.

Select the keyword from the option names below:

ARITHMETIC	NOOBJECT
BASE	NOPROF
COLLATE	NOSOURCE
FIPS	NOXREF
FLAG	OBJECT
INVP	PROFILE
LINE	PRTZO
LIST	RD
LPREC	SCROLL
MAP	SOURCE
NOFIPS	SPREC
NOLIST	XREF
NOMAP	

For example, if the BASIC program is degraded while using the LPREC option, your set of keywords would look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	PERFM
Modifier	LPREC

**Processing Mode**

5. If the problem occurs only in the interactive mode or only in the batch mode, specify that mode in your set of keywords. If the problem occurs in either mode, omit this keyword.

For example, if BASIC terminated abnormally while using the PRINT statement in the BASIC interactive mode, your set of keywords would look like this:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	ABENDx
Modifiers	WRITE INTERACTIVE

You have now collected all the symptoms that describe the problem by building a set of keywords, and you are ready to begin your search. As mentioned earlier, you may either search the software support data base (using "Search Argument Procedure" on page 15), or call the IBM support center directly to have them conduct a search for you.

## Search Argument Procedure

Now that you have developed a set of keywords to describe the program failure, this procedure explains how to use that set of keywords as a search argument in the IBM software support data base. You will be most successful in searching a software support data base if you follow these rules:

- Use only the keywords given in this book.
- Be sure the keywords are spelled exactly as given here.
- Include all the appropriate keywords in your set of keywords.

### Procedure

1. Search the data base using the full set of keywords you developed in the previous procedures. For example:

Component Identification Number	566899601
Release Level	R200
Type-of-Failure Keyword	ABEND15A
Modifier Keywords	WRITE KEY BATCH

As a result of the search, the data base will show you a list of problem descriptions and corrections.

2. Discard each match for which the corresponding correction has been applied to your system.
3. Compare each remaining APAR closing description with the current failure symptoms.
4. If you find an APAR closing description that seems appropriate, correct the problem by applying the correction.
5. If you do not find an appropriate PTF or APAR problem description, then try to vary the search argument by following the suggestions provided under "Techniques for Varying the Search Argument" on page 16.
6. If you do not find a problem description even after you have tried varying the search argument, turn to "APAR Preparation Procedure" on page 18.

## Techniques for Varying the Search Argument

Listed below are some techniques that you can use to vary your search argument by narrowing or broadening it. These techniques may help you find a problem similar to yours.

### Narrowing your Search Argument

If you tried to search with less than a complete set of keywords and found too many problem descriptions to examine, continue to add keywords to make the search argument more specific. As the search argument becomes more specific, the number of problem descriptions will decrease.

Study the possibility of adding more modifier keywords to your set of keywords. (See "Modifier Keyword" on page 12.)

### Broadening your Search Argument

If you used a complete set of keywords and were unable to find problem descriptions to examine, you need to broaden your search argument to make it less specific. As your search argument becomes less specific, the number of problem descriptions will increase. You will find problem descriptions similar to yours, but perhaps they were reported under different symptoms.

Broaden your search by dropping keywords, one at a time, from the right of your set of keywords. Repeat the search.

The following considerations should be made in dropping keywords:

- **Modifier Keywords**

You may have chosen one or more modifier keywords to add to your set of keywords, as in the example below:

Component Identification Number	566899601
Release Level Keyword	R200
Type-of-Failure Keyword	ABEND15A
Modifier Keywords	WRITE KEY BATCH

You may drop one modifier keyword at a time, no matter what position it holds in your set of keywords, and repeat your search.

- **Modifiers Found Under Type-of-Failure Keywords**

For example, under INCORROUT, you may have chosen a modifier for the type of incorrect output you received. By the time you reach "Search Argument Procedure" on page 15, your set of keywords may look like this:

Component Identification Number	566899601
Release Level Keyword	R200
Type-of-Failure Keyword	INCORROUT
Modifier	MISSING

Following this procedure, you would drop MISSING from your set of keywords and repeat the search.

- **Release level keyword**

Eliminating the release level keyword from your set of keywords would result in your receiving the problem descriptions for your type of problem for all releases of IBM BASIC/VM, not merely the errors reported on the release you are currently using.

## APAR Preparation Procedure

You should contact the IBM support center only after the previous diagnostic procedures have been followed, the keyword search has proven unsuccessful, and user specifications have been checked for accuracy.

### Procedure

1. When contacting IBM, you should be prepared to supply:
  - Customer number
  - CMS Release number
  - VM Release number
  - IBM BASIC/VM Release level
  - Current BASIC service level (Program Update Tape (PUT) level)
  - Your set of keywords for searching the software support data base
2. You may also be asked to supply various types of additional information that describe the BASIC environment. If the IBM support center decides that opening an APAR is necessary, they may request items from the following list:
  - System or BASIC commands used
  - BASIC Processor and Library modules
  - Link-edit or loader map, if appropriate
  - BASIC listings, including:
    - Source listing
    - Cross-reference listing
    - Output produced by the compiler LIST option
  - Any debugging output
  - Any spooled CMS console, BASIC LOGs, or special EXECs

- A complete description of any files that the BASIC program is accessing:
    - Record format
    - Device type
    - Block size
    - Catalog listing of the data set (VSAM only)
  - Machine-readable copy of the program causing the problem
  - Data to reproduce the problem
  - As previously mentioned, you may want to write a small test case that re-creates the problem.
3. In addition, a description of the application, the organization of the data sets, and operating instructions may also be necessary.

## Appendix

### IBM BASIC Language Keywords

ACCESS	DIDX	IDN	OFF
AIDX	DIM	IF	OFLOW
AND	DISPLAY	IGNORE	ON
APPEND	DO	IMAGE	OPEN
ARITHMETIC	DOUBLE	INPUT	OPTION
ASORT	DSORT	INTEGER	OR
ATTN	DUPKEY	INTERNAL	ORGANIZATION
	DUPREC	INV	OUTIN
BASE		INVP	OUTPUT
BASIC	ELSE	IOERR	
BEGIN	END		PAGE
BOTTOM	ENDPAGE	KEY	PAGEFLOW
BREAK	EOF	KEYED	PAUSE
	EQ		PLI
CALL	ERROR	LE	PLINK
CASE	EXIT	LEFT	POINTER
CAUSE		LET	POS
CHAIN	FIELDS	LINE	PRINT
CLINK	FILES	LINPUT	PROMPT
CLOSE	FIPS	LOOP	PRTZO
COBOL	FIXED	LPREC	PUT
COLLATE	FLAG	LT	
COM	FLINK		RANDOMIZE
COMMON	FNEND	MARGIN	RD
CON	FONT	MAT	READ
CONTINUE	FOR		REAL
CONV	FORM	NATIVE	REC
	FORTRAN	NE	RECORD
DATA		NEWPAGE	RECORDS
DEBUG	GDDM	NEXT	RELATIVE
DECIMAL	GE	NOFIPS	REM
DEF	GET	NOKEY	RERead
DEFDBL	GO	NONE	RESET
DEFINT	GOSUB	NOREC	REST
DEFSNG	GOTO	NOT	RESTORE
DELETE	GT	NUL\$	RETRY

RETURN  
REWRITE  
RIGHT

SCRATCH  
SEARCH  
SELECT  
SEQUENTIAL

| SINGLE  
SKEY  
SKIP  
SOFLOW  
SPREC  
| SQL  
STANDARD  
STEP  
STOP  
STREAM  
SUB  
SUBEXIT  
SYSTEM

TAB  
THEN  
TO  
TOP

| TRN  
TRACE  
TYPE

UFLOW  
UNTIL  
USE  
USING

VARIABLE

WHILE  
WRITE

ZDIV  
| ZER

# IBM BASIC Intrinsic Functions

ABS	LEN	TRUNCATE
ACOS	LINE	
ANGLE	LOG	UDIM
ASIN	LOG2	UPRC\$
ATN		
	LOG10	VAL
CEIL	LPAD\$	
CEN	LTRM\$	
CHR\$	LWRC\$	
CNT		
CODE	MAX	
	MIN	
COS	MOD	
COSH		
COT		
CSC	ORD	
DAT\$	PARM\$	
DATE	PI	
DATE\$	POS	
DBL	PRD	
DEC		
DEG	RAD	
	REAL	
DET	REC	
DOT	REM	
	RLN	
EPS	RND	
ERR	ROUND	
EXP	RPAD\$	
	RPT\$	
FAH	RTRM\$	
FILE		
FILE\$	SEC	
FILENUM	SGN	
FP	SIN	
	SINH	
IFIX	SIZE	
INF	SNG	
INT	SQR	
IP	SRCH	
	SREP\$	
JDY	STR\$	
	SUM	
KEYNUM		
KLN	TAN	
KPS	TANH	
	TIME	
	TIME\$	

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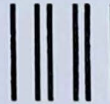
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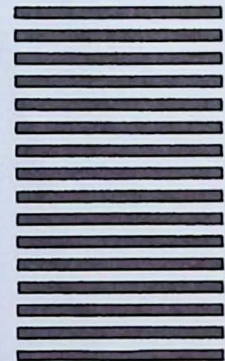


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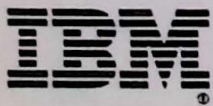
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